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NASA/SP—2012–7501/VOL1



# **NASA THESAURUS**

**VOLUME 1**

**Hierarchical Listing With Definitions**

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January 2012

## NASA STI Program ... in Profile

Since its founding, NASA has been dedicated to the advancement of aeronautics and space science. The NASA scientific and technical information (STI) program plays a key part in helping NASA maintain this important role.

The NASA STI program operates under the auspices of the Agency Chief Information Officer. It collects, organizes, provides for archiving, and disseminates NASA's STI. The NASA STI program provides access to the NASA Aeronautics and Space Database and its public interface, the NASA Technical Reports Server, thus providing one of the largest collections of aeronautical and space science STI in the world. Results are published in both non-NASA channels and by NASA in the NASA STI Report Series, which includes the following report types:

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- **TECHNICAL MEMORANDUM.** Scientific and technical findings that are preliminary or of specialized interest, e.g., quick release reports, working papers, and bibliographies that contain minimal annotation. Does not contain extensive analysis.
- **CONTRACTOR REPORT.** Scientific and technical findings by NASA-sponsored contractors and grantees.

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- **SPECIAL PUBLICATION.** Scientific, technical, or historical information from NASA programs, projects, and missions, often concerned with subjects having substantial public interest.
- **TECHNICAL TRANSLATION.** English-language translations of foreign scientific and technical material pertinent to NASA's mission.

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- E-mail your question to [help@sti.nasa.gov](mailto:help@sti.nasa.gov)
- Fax your question to the NASA STI Information Desk at 443-757-5803
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## Volume 2 • Rotated Term Display

# Introduction

The *NASA Thesaurus* contains the authorized subject terms by which the documents in the NASA Aeronautics and Space Database are indexed and retrieved. The *NASA Thesaurus* comprises two volumes: *Volume 1 – Hierarchical Listing With Definitions* and *Volume 2 – Rotated Term Display*.

The *Hierarchical Listing With Definitions* contains all subject terms and USE cross references currently approved for use, and displays the full hierarchical structure for each term along with a definition when available. In addition, the listing has been developed to serve as an orthographic authority for upper/lowercase forms of all terms and cross references. The **term-added date**, displayed for all terms added after April 1988, is also given. The listing includes terms appearing in the *NASA Thesaurus, Preliminary Edition* (December 1967), the *NASA Thesaurus Alphabetical Update* (September 1971), the *NASA Thesaurus* (1982, 1985, 1988, 1994, and 1998 editions), and other terms approved for use through the end of January 2012. Over 18,400 terms, 4,300 definitions, and approximately 4,500 USE references are contained in the *Hierarchical Listing With Definitions*.

The *Rotated Term Display* is a ready-reference tool that provides thousands of additional ‘access points’ to the thesaurus terminology. It contains the postable terms and nonpostable terms found in the *Hierarchical Listing* arranged in a KWIC (key-word-in-context) index. It is a useful companion to the *Volume 1* listing, containing approximately 52,000 entries.

New editions of the *NASA Thesaurus* CD-ROM are produced annually. Monthly updates are posted on the Thesaurus information page of the NASA scientific and technical information Web site at <http://www.sti.nasa.gov/thestermsupdate.html>. Suggestions for term modification, deletion, and addition may be e-mailed to [michael.genuardi-1@nasa.gov](mailto:michael.genuardi-1@nasa.gov), or postal mailed to:

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The terminology of the earliest edition of the *NASA Thesaurus* was based in large part on the actual indexing vocabulary developed by NASA during the 1960s. Other thesauri, notably the DOD *Thesaurus of Engineering and Scientific Terms* (AD-672000), have provided additional candidate terms. The general guidelines for the initial creation of the *NASA Thesaurus* were based on the COSATI *Guidelines for the Development of Information Retrieval Thesauri* (1 September 1967). Continuing development of the *NASA Thesaurus* conforms to the thesaurus standard of the National Information Standards Organization (*Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies*, ANSI/NISO Z39.19-2005).

## *Nomenclature and Conventions*

**Postable Terms.** Subject terms that have been approved for use in indexing, and thus can be ‘posted.’ In *Volume 1*, postable terms are shown in non-italic type.

**Nonpostable Terms.** Terms that are included for cross reference information and cannot be used for indexing. In *Volume 1*, nonpostable terms are set in italics.

**Term Selection.** Subject terms have been chosen on the basis of their significance and use in aerospace literature and their effectiveness in representing productive retrieval concepts. Particular consideration has been given to frequency of use in earlier NASA indexing and search vocabularies, to relationships with other terms in the vocabulary, and to precise scientific and technical usage.

**Noun Usage.** In general, subject terms are presented in the noun form.

**Singular vs. Plural.** The plural form has, in general, been used for subject terms. The singular form, however, is employed for non-count nouns (such as *snow*), terms that refer to unique entities such as *Mariner 10 Space Probe*, and terms related to specific processes, properties, and conditions.

**Term Length.** No more than 42 characters, including spaces, are used for any subject term. Various words in longer terms are sometimes truncated. Full expanded forms of such truncated terms are generally included in the scope notes.

**Term Ambiguity.** When subject terms have more than one meaning in aerospace usage, or where distinction between terms must be made, clarification is provided in one of two ways:

a) Parenthetical qualifying expressions or glosses are added, becoming part of the subject term. For example:

**sizing (shaping)**  
**sizing (surface treatment)**

b) Scope notes are also added for explanation or definition; they do not become part of the subject term. For example:

**rotational states**  
SN (LIMITED TO MOLECULAR ENERGY LEVELS — EXCLUDES  
ROTATIONAL DYNAMICS OF VEHICLES OR OTHER BODIES)

**Word Order.** Subject terms that consist of more than one word are listed in *direct order*, i.e., in their natural word order rather than in an inverted form. (The *Rotated Term Display* can be used to access terms by embedded words.)

**Abbreviations and Acronyms.** Abbreviations and acronyms that are in common usage in the aerospace and general engineering communities are employed for some postable terms in this thesaurus. In most cases, USE cross references are made from the unabbreviated forms. For example:

Orbiting Solar Observatory  
USE **OSO**

**Synonyms.** When candidate subject terms are true synonyms, one is chosen to be the valid, or postable term, and the other is provided with a USE cross reference. For example:

Columbium	<b>niobium</b>
USE <b>niobium</b>	UF columbium

**Array Terms.** Subject terms with meanings either too broad or ambiguous for effective indexing or retrieval of information, have been designated array terms and carry the following scope note (USE OF A MORE SPECIFIC TERM IS RECOMMENDED — CONSULT THE TERMS LISTED BELOW). Relationships with other postable terms are shown by the Related Term (RT) reference only. For example:

∞ **beams**

SN	(USE OF A MORE SPECIFIC TERM IS RECOMMENDED — CONSULT THE TERMS LISTED BELOW)
RT	beams (radiation) beams (supports)

An infinity symbol (∞) precedes an array term in each of its appearances in *Volume 1*.

**Identifiers.** In the *NASA Thesaurus*, identifiers (i.e., terms that designate unique entities) are treated as regular terms and are provided complete cross references. Most identifiers are proper nouns and many include a numeric or alphabetic designation for a particular model or item. As a general rule, identifiers are added to the thesaurus only if they have an important relation to the aerospace sciences.

**F-111 aircraft**

UF	LASV TFX aircraft
GS	attack aircraft . fighter aircraft . . <b>F-111 aircraft</b> General Dynamics aircraft . <b>F-111 aircraft</b> Grumman aircraft . <b>F-111 aircraft</b> jet aircraft . turbofan aircraft . . <b>F-111 aircraft</b> supersonic aircraft . <b>F-111 aircraft</b>
RT ∞	aircraft mission adaptive wings variable sweep wings

## ***Cross Reference Structure***

Cross reference relationships in the *Hierarchical Listing With Definitions* are shown as follows:

<b>Cross References</b>	<b>Notation</b>
Broader Term	GS
Narrower Term	GS
Related Term	RT
Use	USE
Used For	UF

These cross references have the following applications:

**Broader Term.** This reference indicates that the term represents a more inclusive concept. In the Generic Structure (GS), the broader terms appear above and to the left of the term referenced. For example:

**reentry communication**  
GS telecommunication  
  . space communication  
  . . spacecraft communication  
  . . . **reentry communication**

The terms *telecommunication*, *space communication*, and *spacecraft communication* are broader terms to *reentry communication*.

**Narrower Term.** This reference indicates that the term represents a more specific concept. In the Generic Structure (GS), the narrower terms appear below and to the right (indented) of the term referenced. For example:

GS **scanners**  
  . Coastal Zone Color Scanner  
  . horizon scanners  
  . infrared scanners  
  . ocean color scanner  
  . optical scanners  
  . . flying spot scanners  
  . . multispectral band scanners  
  . . . Thematic Mappers (Landsat)  
  . ultrasonic scanners

The terms *Coastal Zone Color Scanner*, *horizon scanners*, *infrared scanners*, *ocean color scanners*, *optical scanners*, and *ultrasonic scanners* are narrower terms to *scanners*. The terms *flying spot scanners*, *multispectral band scanners*, and *Thematic Mappers (Landsat)* are narrower to both *optical scanners* and *scanners*.

The number of narrower terms is not limited. For example, *artificial satellites* has nearly 500 narrower terms.



**Related Terms (RT).** This reference indicates that the two terms are conceptually associated, but not equivalent or generically related. The RT relationship is reciprocal, as illustrated in the following example:

**radar equipment**

RT radio equipment

**radio equipment**

RT radar equipment

**Use (USE).** This reference indicates that the listed term is not ‘postable,’ i.e., not a valid term, and that the term or terms adjacent to the USE indicator should be used instead. Note that all nonpostable terms are set in italics. For example:

*jet airstreams*

USE **jet streams (meteorology)**

**Used For (UF).** This relation is the reciprocal of the USE cross reference and indicates that the term listed above the UF indicator is a valid or ‘postable’ term, and term or terms adjacent to the UF indicator are nonpostable. For example:

**jet streams (meteorology)**

UF *jet airstreams*

### ***Filing Order***

The ordering of subject terms into an alphabetical arrangement can be accomplished in several ways. The most commonly used methods are the letter-by-letter, word-by-word, and the computer sorting order. In the absence of any universal agreement on a standardized approach, a word-oriented modification of the computer sorting technique has been adopted in this thesaurus.

A special feature has been added to this technique to sort numeric designations in natural ascending order. Non-alphanumeric characters contained within terms are sorted prior to alphanumeric characters. In *Volume 2*, non-alphanumerics are ignored altogether for the general KWIC sort. Thus, embedded parentheses are filed before the alphabet in *Volume 1*, but are ignored for filing in *Volume 2*. Hyphens, slashes and periods follow blank spaces.

### ***Retrospective Indexing***

Between 1984 and 1993, all terms added to the *NASA Thesaurus* were retrospectively assigned to past database records using a method that combined advanced search strategies and manual review. Most of the terms for which this procedure was carried out can be identified by checking the **term-added date** that appears directly below the term in *Volume 1*. Term-added dates are provided for all terms added to the *NASA Thesaurus* after April 1988.

### ***Thesaurus Term Definitions***

Definitions are given for most terms added since 1976 as well as for many earlier terms. Definitions of more common or general scientific terms are given a NASA slant if one exists. Certain terms are not defined as a matter of policy: common place names, chemical elements, specific models of computers, and non-technical terms. Other terms lack definitions because the *NASA Thesaurus* predates by a number of years the systematic effort to define terms. Nevertheless, definitions of older terms are continually being added.

Many of the definitions contained in the *Thesaurus* were constructed by lexicographers at the NASA Center for AeroSpace Information, who rely on the following sources for their information: experts in the field, literature searches from the NASA STI databases, and specialized references. Other definitions were obtained from the following sources:

**AGI.** *Glossary of Geology*, 3rd edition. Alexandria, VA, American Geological Institute, 1987.

**ASTM.** *Compilation of ASTM Standard Definitions*, 6th edition. Philadelphia, PA, ASTM, 1986. Copyright, the American Society for Testing and Materials (ASTM). All rights reserved. Used with the permission of ASTM. The original definitions appeared in the *Annual Book of ASTM Standards*.

**DOE.** *Energy Data Base Subject Thesaurus* (DOE/TIC-7000-R7). Oak Ridge, TN, Department of Energy, 1987.

**IEEE.** *Standard Dictionary of Electrical and Electronics Terms*, Fourth ed., New York, NY, IEEE, 1988.

**SP-7.** *Dictionary of Technical Terms for Aerospace Use*, NASA SP-7. Washington, DC, NASA, 1965.

In some cases, definitions from these sources have been subjected to minor editorial alterations; for example, to make a definition agree in number with the NASA form of the term.

### ***Historical Printed Editions***

*NASA Thesaurus; Subject Terms for Indexing Scientific and Technical Information.* Preliminary Edition, 1967. NASA SP-7030. 3 Vols., *Vol. 1, Alphabetical Listing, A-L; Vol. 2, Alphabetical Listing, M-Z; Vol. 3, Appendixes.*

*NASA Thesaurus Alphabetical Update*, 1971. NASA SP-7040.

*NASA Thesaurus.* 1976 Edition. NASA SP-7050. 2 Vols., *Vol. 1, Alphabetical Listing; Vol. 2, Access Vocabulary.*

*NASA Thesaurus.* 1982 Edition. NASA SP-7051. 2 Vols., *Vol. 1, Hierarchical Listing; Vol. 2, Access Vocabulary.*

*NASA Thesaurus.* 1985 Edition. NASA SP-7053. 2 Vols., *Vol. 1, Hierarchical Listing; Vol. 2, Access Vocabulary.*

*NASA Thesaurus.* 1988 Edition. NASA SP-7064. 3 Vols., *Vol. 1, Hierarchical Listing; Vol. 2, Access Vocabulary; Vol. 3, Definitions.*

*NASA Thesaurus.* 1994 Edition. NASA SP-7096. 3 Vols., *Vol. 1, Hierarchical Listing; Vol. 2, Access Vocabulary; Vol. 3, Definitions.*

*NASA Thesaurus,* 1998 Edition, NASA/SP-1998-7501, 2 Vols., *Vol. 1, Hierarchical Listing With Definitions; Vol. 2, Rotated Term Display.*

## Typical Hierarchical Listing With Definition

- ① **microbursts (meteorology)**
- ② *(added January 1993)*
- ③ SN (EXCLUDES IONOSPHERIC RADIATION MICROBURSTS)
- ④ DEF A strong, localized downdraft that strikes the ground creating an outflow of severe winds near the ground that diverge radially from the impact point.
- ⑤ UF *bow echo microburst events*
- ⑥ GS meteorology
  - . micrometeorology
  - . . **microbursts (meteorology)**
  - storms
  - . storms (meteorology)
  - . . downbursts
  - . . . **microbursts (meteorology)**
- ⑦ RT aviation meteorology
  - flight hazards
  - thunderstorms
  - vertical air currents
  - wind shear

### Key

1. Postable Term
2. Date Added
3. Scope Note
4. Definition
5. Used For Term
6. Generic Structure
7. Related Term

## Typical USE Cross Reference

- ① *vacuum ultraviolet radiation*
- ② USE **far ultraviolet radiation**

### Key

1. Nonpostable Term
2. Postable Note

## Typical Array Term Listing

- ① ∞ **fields**
- ② SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- ③ RT boson fields
  - electric fields
  - field of view
  - field theory (algebra)
  - field theory (physics)
  - gravitational fields
  - magnetic fields
  - military air facilities
  - self consistent fields
  - visual fields

### Key

1. Array Term
2. Scope Note
3. Related Term

# NASA THESAURUS

## VOLUME 1

### HIERARCHICAL LISTING WITH DEFINITIONS

## NUMERALS

### 2001 Mars Odyssey

(added May 2001)

DEF Mars orbiter mission designed to make global observations of Mars to improve our understanding of the Martian climate and geologic history, including the search for liquid water and evidence of past life. The three primary instruments carried onboard are THEMIS (Thermal Emission Imaging System), GRS (Gamma Ray Spectrometer), and MARIE (Mars Radiation Environment Experiment). Launched April 2001.

- GS space missions
  - . Mars missions
  - . . . **2001 Mars Odyssey**
- RT gamma ray spectrometers
  - Mars (planet)
  - Mars exploration
  - Mars surface
  - Mars Surveyor 2001 Mission

## A

### A stars

- GS celestial bodies
  - . stars
  - . . . early stars
  - . . . . hot stars
  - . . . . . **A stars**
- RT blue stars
  - peculiar stars
  - Wolf-Rayet stars

### A-1 aircraft

- UF *Skyraider aircraft*
- GS attack aircraft
  - . **A-1 aircraft**
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . . **A-1 aircraft**
  - monoplanes
  - . **A-1 aircraft**
- RT ∞ aircraft

### A-2 aircraft

- UF *Savage aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . . **A-2 aircraft**
  - jet aircraft
  - . **A-2 aircraft**
  - monoplanes
  - . **A-2 aircraft**
  - North American aircraft
  - . **A-2 aircraft**
- RT ∞ aircraft

### A2F aircraft

- USE **A-6 aircraft**

### A-3 aircraft

- UF *A3D aircraft*
- GS *Skywarrior aircraft*
  - attack aircraft
  - . bomber aircraft
  - . . . **A-3 aircraft**
  - jet aircraft
  - . **A-3 aircraft**
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . . **A-3 aircraft**
  - monoplanes
  - . **A-3 aircraft**
- RT ∞ aircraft

### A3D aircraft

- USE **A-3 aircraft**

### A3J aircraft

- USE **A-5 aircraft**

### A-4 aircraft

- UF *A4D aircraft*
- GS *Skyhawk aircraft*
  - attack aircraft
  - . bomber aircraft
  - . . . **A-4 aircraft**
  - jet aircraft
  - . **A-4 aircraft**
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . . **A-4 aircraft**
  - monoplanes
  - . **A-4 aircraft**
- RT ∞ aircraft
  - J-65 engine

### A4D aircraft

- USE **A-4 aircraft**

### A-5 aircraft

- UF *A3J aircraft*
- GS *Vigilante aircraft*
  - attack aircraft
  - . bomber aircraft
  - . . . **A-5 aircraft**
  - jet aircraft
  - . **A-5 aircraft**
  - monoplanes
  - . **A-5 aircraft**
  - North American aircraft
  - . **A-5 aircraft**
  - supersonic aircraft
  - . **A-5 aircraft**
- RT ∞ aircraft

### A-6 aircraft

- UF *A2F aircraft*
- GS *Intruder aircraft*
  - attack aircraft
  - . bomber aircraft
  - . . . **A-6 aircraft**
  - Grumman aircraft
  - . **A-6 aircraft**
  - jet aircraft
  - . **A-6 aircraft**
  - monoplanes
  - . **A-6 aircraft**
- RT ∞ aircraft

### A-7 aircraft

- UF *Corsair aircraft*
- GS attack aircraft
  - . **A-7 aircraft**
  - jet aircraft
  - . turbofan aircraft
  - . . . **A-7 aircraft**
  - Ling-Temco-Vought aircraft
  - . **A-7 aircraft**
  - monoplanes
  - . **A-7 aircraft**
- RT ∞ aircraft

### A-9 aircraft

- GS attack aircraft
  - . **A-9 aircraft**
  - Northrop aircraft
  - . **A-9 aircraft**
  - reconnaissance aircraft
  - . **A-9 aircraft**
- RT ∞ aircraft

### A-10 aircraft

- GS attack aircraft
  - . **A-10 aircraft**
  - Republic aircraft
  - . **A-10 aircraft**
- RT ∞ aircraft

### A-11 satellite

- USE **Echo 1 satellite**

### A-12 satellite

- USE **Echo 2 satellite**

### A-37 aircraft

- GS attack aircraft
  - . **A-37 aircraft**
  - Cessna aircraft
  - . **A-37 aircraft**
  - monoplanes
  - . **A-37 aircraft**
- RT ∞ aircraft
  - ∞ military aircraft
  - T-37 aircraft

### A-300 aircraft

- GS commercial aircraft
  - . European Airbus
  - . . . **A-300 aircraft**
  - jet aircraft
  - . European Airbus
  - . . . **A-300 aircraft**
  - passenger aircraft
  - . European Airbus
  - . . . **A-300 aircraft**
  - transport aircraft
  - . European Airbus
  - . . . **A-300 aircraft**
- RT ∞ aircraft
  - international cooperation

### A-310 aircraft

- GS commercial aircraft
  - . European Airbus
  - . . . **A-310 aircraft**
  - jet aircraft
  - . European Airbus
  - . . . **A-310 aircraft**
  - passenger aircraft
  - . European Airbus
  - . . . **A-310 aircraft**
  - transport aircraft
  - . European Airbus
  - . . . **A-310 aircraft**
- RT international cooperation

### A-320 aircraft

- GS commercial aircraft
  - . European Airbus
  - . . . **A-320 aircraft**
  - jet aircraft
  - . European Airbus
  - . . . **A-320 aircraft**
  - passenger aircraft
  - . European Airbus
  - . . . **A-320 aircraft**
  - transport aircraft
  - . European Airbus
  - . . . **A-320 aircraft**
- RT international cooperation

### A-330 aircraft

(added September 1994)

- GS commercial aircraft
  - . European Airbus
  - . . . **A-330 aircraft**
  - jet aircraft
  - . European Airbus
  - . . . **A-330 aircraft**
  - passenger aircraft
  - . European Airbus
  - . . . **A-330 aircraft**
  - transport aircraft
  - . European Airbus
  - . . . **A-330 aircraft**
- RT ∞ aircraft
  - international cooperation

### A-340 aircraft

(added September 1994)

- GS commercial aircraft
  - . European Airbus

## A-380 aircraft

### . . A-340 aircraft

jet aircraft

. European Airbus

### . . A-340 aircraft

passenger aircraft

. European Airbus

### . . A-340 aircraft

transport aircraft

. European Airbus

### . . A-340 aircraft

RT ∞ aircraft

international cooperation

## A-380 aircraft

(added June 2005)

GS commercial aircraft

. European Airbus

### . . A-380 aircraft

jet aircraft

. European Airbus

### . . A-380 aircraft

passenger aircraft

. European Airbus

### . . A-380 aircraft

transport aircraft

. European Airbus

### . . A-380 aircraft

RT civil aviation

international cooperation

## AABNCP

USE **E-4A aircraft**

## AAP 1 mission

RT Apollo applications program

Apollo project

Skylab program

## AAP 2 mission

RT Apollo applications program

Apollo project

Skylab program

## AAP 3 mission

RT Apollo applications program

Apollo project

Skylab program

## AAP 4 mission

RT Apollo applications program

Apollo project

Skylab program

## abbreviations

(added December 1994)

UF *acronyms*

*initialisms*

RT alphabets

coding

dictionaries

symbols

terminology

words (language)

## abdomen

GS anatomy

. **abdomen**

RT digestive system

gastrointestinal system

intestines

peritoneum

stomach

ventral sections

viscera

## Abel function

GS analysis (mathematics)

. real variables

. . **Abel function**

functions (mathematics)

. **Abel function**

RT series (mathematics)

## aberration

DEF In astronomy, the apparent angular displacement of the position of a celestial body in the direction of motion of the observer, caused by the combination of the velocity of the observer and the velocity of light. In optics, a specific deviation from perfect imagery, as, for

example: spherical aberration, coma, astigmatism, curvature of field, and distortion.

RT abnormalities

anisoplanatism

asphericity

blurring

∞ coma

crystal optics

deviation

distortion

grazing incidence

spatial filtering

## abilities

UF *proficiency*

*skills*

GS **abilities**

. aptitude

RT effort

human performance

intelligence

intelligence tests

mental performance

psychomotor performance

transfer of training

## abiogenesis

DEF The development of living organisms from lifeless matter.

GS evolution (development)

. biological evolution

. . **abiogenesis**

RT autocatalysis

chemical evolution

life sciences

panspermia

protobiology

self assembly

spermatogenesis

## ablated nosetips

USE **PANT program**

## ablation

DEF The removal of surface material from a body by vaporization, melting, chipping, or other erosive process; specifically, the intentional removal of material from a nose cone or spacecraft during high speed movement through a planetary atmosphere to provide thermal protection to the underlying structure.

GS **ablation**

. laser ablation

RT ablative materials

ablative nose cones

aerodynamic heat transfer

aerodynamic heating

aerothermochemistry

atmospheric entry

burnthrough (failure)

charring

cooling

decomposition

erosion

gas-metal interactions

heat shielding

impingement

jet impingement

mass transfer

melting

pyrolysis

reentry

reentry effects

reentry physics

reentry shielding

sublimation

temperature effects

thermal absorption

thermal decomposition

vaporizing

## ablative materials

DEF Materials, especially coating materials, designed to provide thermal protection to a body in a fluid stream through the loss of mass.

RT ablation

carbon-phenolic composites

cooling

heat shielding

heat sinks

∞ materials

nose cones

nozzle inserts

pyrolytic materials

refractory materials

temperature

thermal control coatings

thermal protection

## ablative nose cones

GS cones

. nose cones

. . **ablative nose cones**

forebodies

. noses (forebodies)

. . nose cones

. . . **ablative nose cones**

RT ablation

heat shielding

reentry shielding

reentry vehicles

rocket nose cones

shielding

## Ablestar launch vehicle

GS launch vehicles

. **Ablestar launch vehicle**

rocket vehicles

. multistage rocket vehicles

. . **Ablestar launch vehicle**

RT liquid propellant rocket engines

## ABM

USE **apogee boost motors**

## abnormalities

RT aberration

deviation

distortion

eccentricity

irregularities

uniqueness

## aborigines

RT anthropology

human beings

inhabitants

## abort apparatus

UF *flight termination systems*

GS safety devices

. **abort apparatus**

RT aborted missions

aircraft safety

arresting gear

∞ barriers

brakes (for arresting motion)

drag devices

ejection seats

∞ equipment

escape capsules

escape rockets

flying ejection seats

## abort trajectories

GS trajectories

. **abort trajectories**

RT aborted missions

emergency landing

MATTS (systems)

## aborted missions

RT abort apparatus

abort trajectories

destruction

engine failure

escape capsules

escape rockets

failure

malfunctions

∞ missions

## abrasion

DEF The surface loss of a material due to frictional forces.

RT abrasives

chipping

cleaning

cutting

dry friction

- erosion  
files (tools)  
friction  
grinding (material removal)  
lesions  
metallography  
polishing  
scoring  
soil erosion  
tribology  
wear  
wear resistance
- abrasion resistance**  
GS mechanical properties  
. wear resistance  
. . **abrasion resistance**  
RT hardness  
∞ resistance  
toughness
- abrasives**  
DEF Rocks, minerals, or other substances that, owing to their superior hardness, toughness, consistency, or other properties, are suitable for grinding, cutting, polishing, scouring, or similar use.  
RT abrasion  
aluminum oxides  
Carborundum (trademark)  
ceramics  
diamonds  
grit  
paint removal  
pumice  
quartz  
silicon carbides
- Abrikosov theory**  
RT crystal structure  
electromagnetic fields  
horseshoe vortices  
superconductivity  
superconductors (materials)  
∞ theories  
vortices
- abscisic acid**  
(added August 2004)  
DEF Abscission-accelerating plant growth substance isolated from young cotton fruit, leaves of sycamore, birch, and other plants, and from potatoes, lemons, avocados, and other fruits.  
GS acids  
. carboxylic acids  
. . **abscisic acid**  
organic compounds  
. carboxylic acids  
. . **abscisic acid**  
plant growth regulators  
. **abscisic acid**  
terpenes  
. **abscisic acid**  
RT plant physiology  
plants (botany)
- absolute zero**  
DEF Temperature of -273. 16 deg. C or -459. 69 deg. F or 0 deg. K at which molecular motion vanishes and a body has no heat energy.  
GS temperature  
. **absolute zero**  
RT cryogenic temperature  
cryogenics  
subzero temperature  
temperature effects  
temperature scales  
zero point energy
- absorbents**  
UF *molecular sieves*  
GS sorbents  
. **absorbents**  
RT ∞ absorbents  
absorbents (equipment)  
absorbents (materials)  
adsorbents  
air conditioning equipment  
desiccants
- low density materials  
material absorption  
∞ materials
- ∞ absorbents**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT absorbents  
absorbents (equipment)  
absorbents (materials)  
attenuators  
cleaners  
oscillation dampers  
shock absorbers  
vibration isolators
- absorbents (equipment)**  
SN (EXCLUDES EQUIPMENT FOR ABSORBING ENERGY)  
RT absorbents  
∞ absorbents  
absorbents (materials)  
air conditioning equipment  
cleaners  
columns (process engineering)  
condensers (liquefiers)  
cooling systems  
degassing  
drying apparatus  
∞ equipment  
material absorption  
refrigerating machinery  
shock absorbers
- absorbents (materials)**  
SN (EXCLUDES ABSORBENTS--LIMITED TO MATERIALS FOR ABSORBING RADIATION RATHER THAN OTHER MATERIALS)  
GS **absorbents (materials)**  
. neutron absorbents  
. radar absorbents  
. . antiradar coatings  
. solar energy absorbents  
RT absorbents  
∞ absorbents  
absorbents (equipment)  
acoustic retrofitting  
attenuators  
cleaners  
electromagnetic absorption  
electromagnetic wave filters  
energy absorption  
∞ filters  
heat sinks  
insulation  
jackets  
low density materials  
∞ materials  
radiation shielding  
refrigerants  
shielding  
sinks  
stopping power  
suppressors
- absorptance**  
DEF The ratio of the radiant flux absorbed by a body to that incident upon it.  
GS electromagnetic properties  
. optical properties  
. . **absorptance**  
RT albedo  
capture effect  
cosmic ray albedo  
density (mass/volume)  
Earth albedo  
electromagnetic absorption  
light transmission  
lunar albedo  
microwave absorption  
opacity  
reflectance  
surface properties  
transmission  
transmissivity  
transmittance  
transparence
- turbidity
- ∞ absorption**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF The process by which radiant energy is absorbed and converted into other forms of energy. In general, the taking up or assimilation of one substance by another. In vacuum technology, gas entering the interior of a solid.  
RT absorption cooling  
absorption cross sections  
absorption spectra  
absorption spectroscopy  
absorptivity  
activated carbon  
adsorption  
atomic collisions  
attenuation  
auroral absorption  
beneficiation  
capture effect  
collision parameters  
cosmic ray albedo  
damping  
desorption  
diffusion  
drying  
electromagnetic absorption  
energy absorption  
energy absorption films  
gamma ray absorption  
infrared absorption  
infrared spectra  
material absorption  
materials recovery  
microwave absorption  
moderation (energy absorption)  
molecular absorption  
multiphoton absorption  
permeating  
photoabsorption  
planetary atmospheres  
polar cap absorption  
radiation absorption  
self absorption  
sorption  
sound transmission  
thermal absorption  
ultraviolet absorption  
visible spectrum  
x ray absorption
- absorption bands*  
USE **absorption spectra**
- absorption coefficient*  
USE **absorptivity**
- absorption cooling**  
DEF Refrigeration in which cooling is effected by the expansion of liquid ammonia into gas and the absorption of the gas by water. The ammonia is reused after the water evaporates.  
GS cooling  
. **absorption cooling**  
RT ∞ absorption  
ammonia  
magnetic cooling  
refrigerants
- absorption cross sections**  
DEF In radar, cross sections characterized by the amount of power removed from a beam by absorption of radio energy by a target to the power in the beam incident upon the target.  
Used for capture cross sections.  
UF *capture cross sections*  
RT ∞ absorption  
∞ cross sections  
ionization cross sections  
neutron cross sections  
radiation absorption  
scattering cross sections  
stopping power
- absorption spectra**  
DEF The arrays of absorption lines and absorption bands which result from the passage of radiant energy from a continuous source

## absorption spectroscopy

through a selectively absorbing medium cooler than the source. Used for absorption bands and spectral absorption.

- UF *absorption bands*  
*spectral absorption*
- GS spectra
  - . radiation spectra
  - . . . **absorption spectra**
  - . . . Fraunhofer lines
  - . . . Herzberg bands
  - . . . telluric lines
  - . spectral bands
  - . . . **absorption spectra**
  - . . . Fraunhofer lines
  - . . . Herzberg bands
  - . . . telluric lines
- RT ∞ absorption
  - Balmer series
- ∞ bands
  - blue shift
  - continuous radiation
  - D lines
  - differential absorption lidar
  - electromagnetic absorption
  - electromagnetic spectra
  - electron spectroscopy
  - electronic spectra
  - emission spectra
  - energy spectra
  - Fraunhofer line discriminators
  - galactic nuclei
  - gamma ray absorptiometry
  - H alpha line
  - H beta line
  - H gamma line
  - H lines
  - ionizing radiation
  - K lines
  - laser spectrometers
  - line spectra
  - microwave absorption
  - microwave spectra
  - molecular spectra
  - molecular spectroscopy
  - oscillator strengths
  - paramagnetic resonance
  - Paschen series
  - photoacoustic spectroscopy
  - photoluminescent bands
  - photon absorptiometry
  - Raman spectra
  - rotational spectra
  - Rydberg series
  - Schumann-Runge bands
  - self absorption
  - solar spectra
  - solar spectrometers
  - spectrum analysis
  - spin temperature
  - stellar spectra
  - symbiotic stars
  - ultraviolet spectra
  - visible spectrum

### absorption spectroscopy

- GS spectroscopy
  - . **absorption spectroscopy**
  - . . . optogalvanic spectroscopy
- RT ∞ absorption
  - Fraunhofer lines
  - infrared spectroscopy
  - laser-induced breakdown spectroscopy
  - optical equipment
  - optical measuring instruments
  - ultraviolet spectroscopy

### absorptive index

USE **absorptivity**

### absorptivity

DEF The capacity of a material to absorb incident radiant energy, measured as the absorptance of a specimen of material thick enough to be completely opaque, and having an optically smooth surface. Used for absorption coefficient and absorptive index.

- UF *absorption coefficient*  
*absorptive index*

GS electromagnetic properties

. optical properties

. . **absorptivity**

- RT ∞ absorption
  - Beer law
  - Bouguer law
  - density (mass/volume)
  - electromagnetic absorption
  - Kirchhoff law of radiation
  - microwave absorption
  - opacity
  - oscillator strengths
  - photoacoustic spectroscopy
  - scattering coefficients
  - self absorption
  - transmissivity
  - transparence

### abstracts

- GS documents
  - . **abstracts**
  - summaries
  - . **abstracts**
- RT annotations
  - bibliographies
  - indexes (documentation)
  - information retrieval
  - technical writing

### abundance

DEF The mean concentration of an element in a geochemical reservoir, e.g., the abundance of Ni in meteorites or the crustal abundance of oxygen. Also used for the relative average content, e.g., the order of abundance of elements in the Earth's crust is O, Si, AL, Fe, Ca, etc. Used for element abundance.

UF *element abundance*

- RT availability
  - energy policy
  - geochemistry
  - metallic stars
  - metallicity
  - reserves
  - resources
  - stellar composition

### AC (current)

USE **alternating current**

### AC generators

DEF Generators for the production of alternating-current power. Used for alternating current generators and alternators (generators).

UF *alternating current generators*  
*alternators (generators)*

- GS electric generators
  - . **AC generators**
  - . . linear alternators
  - . . static alternators

- RT compulsators
  - free-piston engines
- ∞ generators
  - rotating generators
  - turbogenerators

### AC-1 aircraft

USE **DHC 4 aircraft**

### accelerated life tests

DEF Methods designed to approximate, in a short time, the deteriorating effects under normal long-term service conditions.

- RT acceptability
  - evaluation
  - fatigue life
  - life (durability)
  - performance tests
  - quality control
  - service life
- ∞ tests

### accelerating agents

- RT ∞ accelerators
  - admixture
- ∞ agents
  - catalysts

retardants

### ∞ acceleration

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The time rate of change of velocity.
- RT acceleration (physics)
  - acceleration protection
  - acceleration stresses (physiology)
- ∞ accelerators
  - angular acceleration
  - catalysis
  - electromagnetic acceleration
  - electron acceleration
  - gravimetry
  - high acceleration
  - high gravity environments
  - human tolerances
  - impact acceleration
  - particle acceleration
  - physiological acceleration
  - plasma acceleration
  - transverse acceleration

### acceleration (physics)

DEF The rate of change of velocity. The act or process of accelerating or the state of being accelerated. Used for boost and G force.

UF *boost*  
*G force*

- GS rates (per time)
  - . **acceleration (physics)**
  - . . angular acceleration
  - . . deceleration
  - . . . spin reduction
  - . . electron acceleration
  - . . high acceleration
  - . . high gravity environments
  - . . impact acceleration
  - . . particle acceleration
  - . . plasma acceleration
  - . . transverse acceleration

- RT ∞ acceleration
  - acceleration measurement
  - acceleration stresses (physiology)
  - accelerometers
  - body kinematics
  - expulsion
  - flight stress (biology)
- ∞ force
  - kinematics
  - kinetics
  - mechanical shock
- ∞ motion
  - physiological acceleration
  - stress (physiology)
  - thrust
  - thrust-weight ratio
  - velocity

### acceleration measurement

(added April 1997)

- SN (LIMITED TO TECHNIQUES AND INSTRUMENTATION FOR DETERMINING THE DIRECTION AND MAGNITUDE OF ACCELERATION; USE TERMS FROM THE "ACCELERATION (PHYSICS)" HIERARCHY TO INDICATE THE DATA OBTAINED FROM MEASUREMENT)
- RT acceleration (physics)
  - accelerometers
  - angular acceleration
  - inertial navigation
- ∞ measurement
  - robot sensors
  - transverse acceleration
  - velocity measurement

### acceleration protection

- GS protection
  - . **acceleration protection**
- RT ∞ acceleration
  - embedding
  - supine position

### acceleration stresses (physiology)

- GS stress (biology)
  - . **acceleration stresses (physiology)**
  - . . centrifuging stress
  - stress (physiology)
  - . **acceleration stresses (physiology)**

. . centrifuging stress  
 RT ∞ acceleration  
 acceleration (physics)  
 aerospace medicine  
 artificial gravity  
 body kinematics  
 dizziness  
 gravitational effects  
 gravitational physiology  
 gravity perception  
 head movement  
 high acceleration  
 lower body negative pressure  
 motion sickness  
 physiological acceleration  
 transverse acceleration

**acceleration tolerance**

SN (LIMITED TO ABILITY OF ORGANISMS TO WITHSTAND ACCELERATION--FOR EFFECTS ON EQUIPMENT, USE SHOCK RESISTANCE AND MECHANICAL SHOCK)  
 GS tolerances (physiology)  
 . **acceleration tolerance**  
 RT blackout (physiology)  
 blackout prevention  
 centrifuging stress  
 gravitational effects  
 gravity perception  
 high acceleration  
 human centrifuges  
 human tolerances  
 ∞ resistance

∞ **accelerators**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF Machines that ionize gases and electrically accelerate the ions onto targets.  
 RT accelerating agents  
 ∞ acceleration  
 coaxial plasma accelerators  
 cyclic accelerators  
 Cyclops plasma accelerator  
 electron accelerators  
 geocyclotrons  
 Hall accelerators  
 hypervelocity guns  
 ion accelerators  
 linear accelerators  
 mass drivers  
 Nimrod accelerator  
 particle accelerator targets  
 particle accelerators  
 plasma accelerators  
 racetracks (particle accelerators)  
 railgun accelerators  
 ram accelerators  
 SEPAC (payload)  
 storage rings (particle accelerators)  
 synchrophasotrons  
 Van de Graaff accelerators

**accelerometers**

DEF Transducers which measure acceleration or gravitational forces capable of imparting acceleration.  
 GS measuring instruments  
 . **accelerometers**  
 . . strain gage accelerometers  
 RT acceleration (physics)  
 acceleration measurement  
 gravimeters  
 gravimetry  
 gyroscopic pendulums  
 mechanical measurement  
 pendulums  
 seismographs  
 shock measuring instruments  
 speed indicators  
 thrust measurement  
 velocity measurement  
 vibration meters

**acceptability**

UF *acceptance*  
 RT accelerated life tests  
 compatibility  
 evaluation  
 examination

figure of merit  
 inspection  
 performance tests  
 proving  
 quality control  
 rejection  
 reliability  
 risk  
 samples  
 standards  
 suitability  
 ∞ tests  
 tolerances (mechanics)  
 total quality management  
 validity

*acceptance*

USE **acceptability**

**acceptor materials**

GS semiconductors (materials)  
 . **acceptor materials**  
 RT carrier density (solid state)  
 electrons  
 holes (electron deficiencies)  
 ∞ materials

**access control**

DEF Hardware or software features, operating procedures, or management procedures designed to permit authorized access to a computer system.  
 RT communication networks  
 computer information security  
 computer security  
 ∞ control  
 data transmission  
 firewalls (computers)  
 intrusion detection (computers)  
 multiple access  
 multiplexing  
 radio communication  
 telecommunication

**access time**

GS time  
 . **access time**  
 RT data processing rates (per time)  
 time constant  
 ∞ time response  
 transmission rate (communications)

**accessories**

UF *attachments*  
 RT ∞ components  
 extensions  
 fittings  
 inserts  
 subassemblies

**accident investigation**

GS investigation  
 . **accident investigation**  
 . . aircraft accident investigation  
 RT accidents  
 automobile accidents  
 lessons learned  
 wreckage

**accident prevention**

UF *precautions*  
 GS prevention  
 . **accident prevention**  
 RT accidents  
 aerospace safety  
 air bag restraint devices  
 automobile accidents  
 avoidance  
 fire prevention  
 hazards  
 lessons learned  
 protection  
 risk management  
 safety  
 safety devices  
 safety management  
 situational awareness  
 warning

warning systems

**accident proneness**

RT safety devices  
 safety factors

**accidents**

GS **accidents**  
 . aircraft accidents  
 . . bird-aircraft collisions  
 . automobile accidents  
 . loss of coolant  
 RT accident investigation  
 accident prevention  
 air bag restraint devices  
 crash injuries  
 crashes  
 destruction  
 disasters  
 emergencies  
 explosions  
 fires  
 first aid  
 hazards  
 industrial safety  
 injuries  
 lessons learned  
 sabotage  
 safety  
 safety devices  
 traffic  
 wreckage

**acclimatization**

DEF The adjustments of a human body or other organism to a new environment; the bodily changes which tend to increase efficiency and reduce energy loss. Used for deacclimatization.  
 UF *deacclimatization*  
 GS adaptation  
 . **acclimatization**  
 . . altitude acclimatization  
 . . cold acclimatization  
 . . heat acclimatization  
 RT homeostasis  
 liquid breathing  
 stress (biology)  
 stress (physiology)  
 tolerances (physiology)

**accommodation**

RT adaptation  
 correction  
 eye (anatomy)  
 focusing  
 visual accommodation

**accommodation coefficient**

DEF The ratio of the average energy actually transferred between a surface and impinging gas molecules which are scattered by the surface to the average energy which would theoretically be transferred if the impinging molecules reached complete thermal equilibrium with the surface before leaving the surface. Used for thermal accommodation coefficients.  
 UF *thermal accommodation coefficients*  
 GS coefficients  
 . **accommodation coefficient**  
 RT heat transfer coefficients

**accounting**

DEF The practice and system of recording and summarizing business and financial transactions, and reporting as well as verifying and analyzing their results.  
 RT budgeting  
 costs  
 finance

*accretion*

USE **deposition**

**accretion disks**

DEF Rotation disks of matter surrounding an astronomical object, such as a star, galactic nucleus, black hole, etc., which is accumulated gravitationally by the object.  
 RT astrophysics  
 binary stars



## accumulations

black holes (astronomy)  
blazars  
cooling flows (astrophysics)  
disks (shapes)  
eclipsing binary stars  
galactic nuclei  
gravitational binding energy  
protoplanetary disks  
rotating disks  
stellar mass accretion  
superhumps (astronomy)  
x ray binaries

### accumulations

RT acquisition  
agglomeration  
assemblies  
coagulation  
collection  
concentrating  
deposition  
filling  
growth  
increasing  
input  
nucleation  
settling  
stockpiling

### accumulators

DEF Devices or apparatus that accumulate or store. Used for collectors.

UF *collectors*  
GS **accumulators**  
. accumulators (computers)  
. dust collectors  
. solar collectors  
RT anodes  
concentrators  
entrapment  
fuel systems  
pressure vessels  
pressurizing

### accumulators (computers)

DEF In computer technology, devices which store a number and upon receipt of another number add it to the number already stored and store the sum.

GS accumulators  
. **accumulators (computers)**  
computer components  
. computer storage devices  
. . registers (computers)  
. . . **accumulators (computers)**  
RT adding circuits  
counters  
∞ equipment

### accuracy

DEF The degree of agreement of the measurements with the true value of the magnitude of the quantity measured. Used for error band and fidelity.

UF *error band*  
*fidelity*  
GS **accuracy**  
. geodetic accuracy  
. geometric accuracy  
RT angular resolution  
calibrating  
consistency  
correction  
definition  
drift (instrumentation)  
dynamic characteristics  
errors  
high resolution  
hysteresis  
linearity  
∞ measurement  
miss distance  
precision  
quality  
range errors  
reliability  
resolution  
sequential control  
standards  
surveys

∞ tests  
tolerances (mechanics)  
validity  
virtual properties

### ACE satellite

(added December 1999)

USE **Advanced Composition Explorer**

### ACEE program

DEF A NASA program started in 1975 to reduce fuel consumption for transport aircraft through the study of structural and aerodynamic energy efficiency as well as engine energy efficiency consisting of engine component improvement, new energy efficient engines, and advanced turbopropellers. The acronym stands for aircraft energy efficiency. Used for Aircraft Energy Efficiency program and energy efficiency transport program.

UF *Aircraft Energy Efficiency program*  
*Energy Efficiency Transport program*  
GS programs  
. NASA programs  
. . **ACEE program**  
RT aircraft engines  
combustion efficiency

### acetaldehyde

GS aldehydes  
. **acetaldehyde**

### acetals

GS ethers  
. **acetals**

### acetanilide

UF *phenacetin*  
GS nitrogen compounds  
. amides  
. . **acetanilide**

### acetates

GS **acetates**  
. cobalt acetates  
. lead acetates  
. sodium chlorodifluoroacetates  
. triacetin  
RT acetic acid  
acetylsalicylic acid  
esters  
ethylenediaminetetraacetic acids

### acetylation

USE **acetylation**

### acetazolamide

GS nitrogen compounds  
. amides  
. . **acetazolamide**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . azoles  
. . . . **acetazolamide**  
RT carbonic anhydrase  
diuretics

### acetic acid

GS acids  
. carboxylic acids  
. . fatty acids  
. . . **acetic acid**  
. . . . ethylenediaminetetraacetic acids  
. . . . iodoacetic acid  
organic compounds  
. carboxylic acids  
. . fatty acids  
. . . **acetic acid**  
. . . . ethylenediaminetetraacetic acids  
. . . . iodoacetic acid  
RT acetates  
acetyl compounds  
triacetin

### acetone

GS ketones  
. **acetone**  
RT acetylacetone

pentanone

### acetonitrile

UF *ethane nitrile*  
*methyl cyanide*  
GS cyanides  
. **acetonitrile**  
methyl compounds  
. **acetonitrile**  
nitrogen compounds  
. nitriles  
. . **acetonitrile**  
organic compounds  
. nitriles  
. . **acetonitrile**

### acetyl compounds

GS organic compounds  
. **acetyl compounds**  
. . acetylacetone  
. . acetylsalicylic acid  
RT acetic acid  
acetylation  
aldehydes  
∞ chemical compounds  
esters

### acetylacetone

GS ketones  
. **acetylacetone**  
organic compounds  
. acetyl compounds  
. . **acetylacetone**  
RT acetone  
pentanone

### acetylation

DEF Substitution of an acetyl radical for an active hydrogen. Specifically, formation of cellulose acetate from cellulose. Used for acetation.

UF *acetylation*  
GS chemical reactions  
. acylation  
. . **acetylation**  
RT acetyl compounds

### acetylcholine

(added August 2004)

DEF A major neurotransmitter in vertebrates at neuromuscular junctions, autonomic ganglia, parasympathetic effector junctions, a subset of sympathetic effector junctions, and at many sites in the central nervous system.

GS neurotransmitters  
. **acetylcholine**  
organic compounds  
. amines  
. . **acetylcholine**  
RT neuromuscular transmission  
synapses  
vasodilator agents

### acetylene

GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . alkynes  
. . . . **acetylene**  
RT cyanoacetylene  
hydrocarbon fuels  
oxyacetylene

### acetylsalicylic acid

UF *ASA*  
GS acids  
. carboxylic acids  
. . fatty acids  
. . . **acetylsalicylic acid**  
organic compounds  
. acetyl compounds  
. . **acetylsalicylic acid**  
. carboxylic acids  
. . fatty acids  
. . . **acetylsalicylic acid**  
RT acetates  
salicylates

### achievement

RT completeness  
goals

- learning
- achondrites**  
 GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . **achondrites**  
 . . . . Bondoc meteorite  
 . . . . chassignites  
 . . . . Kapoeta achondrite  
 . . . . nakhlites  
 . . . . Norton County achondrite  
 . . . . shergottites  
 . . . . SNC meteorites  
 . . . . urelites  
 RT chondrites  
 iron meteorites
- acid base equilibrium**  
 GS chemical equilibrium  
 . **acid base equilibrium**  
 RT  $\infty$  equilibrium  
 homeostasis  
 pH  
 pH factor  
 stabilization  
 thermodynamic equilibrium
- acid rain**  
 DEF Low pH rainfall resulting from atmospheric reactions of aerosols containing chlorides and sulfates (or other negative ions).  
 GS precipitation (meteorology)  
 . rain  
 . . **acid rain**  
 RT air pollution  
 atmospheric chemistry  
 atmospheric moisture  
 clouds (meteorology)  
 dew  
 meteorology  
 pH  
 rainstorms  
 snow  
 sulfur oxides
- acidity**  
 GS chemical properties  
 . **acidity**  
 RT hydrogen ions  
 ion concentration  
 pH  
 titration
- acidosis**  
 DEF Reduction of alkali reserves due to an excess of acid metabolites.  
 RT alkalosis  
 hyperventilation  
 pH  
 pH factor  
 toxicity
- acids**  
 GS **acids**  
 . amino acids  
 . . alanine  
 . . . phenylalanine  
 . . . aspartic acid  
 . . cysteine  
 . . dopa  
 . . folic acid  
 . . glutamic acid  
 . . glutamine  
 . . glycine  
 . . hippuric acid  
 . . histidine  
 . . leucine  
 . . . norleucine  
 . . lysine  
 . . melanoidin  
 . . methionine  
 . . thyroxine  
 . . tryptophan  
 . . tyrosine  
 . amobarbital  
 . ascorbic acid  
 . boric acids  
 . butyric acid  
 . carbonic acid  
 . carboxylic acids  
 . . acrylic acid  
 . . alanine  
 . . . phenylalanine  
 . . aspartic acid  
 . . citric acid  
 . . dicarboxylic acids  
 . . fatty acids  
 . . . acetic acid  
 . . . . ethylenediaminetetraacetic acids  
 . . . . iodoacetic acid  
 . . . . acetylsalicylic acid  
 . . . . benzoic acid  
 . . . . benzoic acid  
 . . . . lipoic acid  
 . . . . oleic acid  
 . . . . palmitic acid  
 . . . . propionic acid  
 . . . . sebamic acid  
 . . . . valeric acid  
 . . . . abscisic acid  
 . . . . folic acid  
 . . . . formhydroxamic acid  
 . . . . formic acid  
 . . . . Hexogenes (trademark)  
 . . . . lactic acid  
 . . . . lysine  
 . . . . nicotinic acid  
 . . . . oxalic acid  
 . . . . oxamic acids  
 . . . . tryptophan  
 . . . . chromic acid  
 . . . . cyanuric acid  
 . . . . cytidylic acid  
 . . . . hydrazoic acid  
 . . . . hydrobromic acid  
 . . . . hydrochloric acid  
 . . . . hydrocyanic acid  
 . . . . hydrofluoric acid  
 . . . . nitric acid  
 . . . . nucleic acids  
 . . . . deoxyribonucleic acid  
 . . . . complementary DNA  
 . . . . ribonucleic acids  
 . . . . indoleacetic acids  
 . . . . oxidase  
 . . . . perchloric acid  
 . . . . phosphoric acid  
 . . . . sulfonic acid  
 . . . . sulfuric acid  
 . . . . thymidine  
 . . . . thymine  
 . . . . uric acid  
 . . . . uridylic acid  
 . . . . xanthic acids  
 RT adrenocorticotropin (ACTH)  
 anhydrides  
 hydrogen compounds  
 inorganic compounds  
 $\infty$  oxygen compounds
- acoustic attenuation**  
 GS attenuation  
 . wave attenuation  
 . . **acoustic attenuation**  
 . . . shock wave attenuation  
 RT acoustic coupling  
 acoustics  
 anechoic chambers  
 atmospheric attenuation  
 bioacoustics  
 grazing flow  
 noise reduction  
 sound amplification  
 wave propagation  
 zero sound
- acoustic combustion*  
 USE **combustion stability**
- acoustic coupling**  
 (added September 1988)  
 GS coupling  
 . **acoustic coupling**  
 RT acoustic attenuation  
 acoustic excitation  
 acoustics  
 energy transfer  
 sound waves
- wave interaction
- acoustic delay lines**  
 DEF Devices used in a communications link or a computer memory in which the signal is delayed by the propagation of sound waves. Used for sonic waveguides.  
 UF *sonic waveguides*  
 GS delay lines  
 . **acoustic delay lines**  
 RT computer storage devices  
 delay circuits  
 surface acoustic wave devices  
 transmission lines
- acoustic detection*  
 USE **sound detecting and ranging**
- acoustic ducts**  
 GS ducts  
 . **acoustic ducts**  
 RT grazing flow  
 noise reduction  
 spatial marching
- acoustic emission**  
 DEF The stress and pressure waves generated during dynamic processes in materials and used in assessing structural integrity in machined parts.  
 GS emission  
 . **acoustic emission**  
 RT acoustic measurement  
 crack propagation  
 failure analysis  
 fatigue testing machines  
 nondestructive tests  
 stress waves
- acoustic excitation**  
 DEF The process of inducing vibration in a structure by exposure to sound waves.  
 GS excitation  
 . wave excitation  
 . . **acoustic excitation**  
 RT acoustic coupling  
 acoustic resonance  
 acoustics  
 sound amplification  
 surface noise interactions  
 thermoacoustic effects
- acoustic fatigue**  
 UF *sonic fatigue*  
 GS fatigue (materials)  
 . **acoustic fatigue**  
 RT acoustics
- acoustic frequencies**  
 UF *sound frequencies*  
 GS frequencies  
 . **acoustic frequencies**  
 . . audio frequencies  
 . . . quefencies  
 . . . screech tones  
 RT acoustic measurement  
 acoustic properties  
 acoustic resonance  
 acoustics  
 frequency ranges  
 noise spectra  
 pressure oscillations  
 resonant frequencies  
 sound waves  
 subaudible frequencies  
 ultrasonic radiation  
 whispering gallery modes
- acoustic generators*  
 USE **sound generators**
- acoustic imaging**  
 (added February 1993)  
 GS imaging techniques  
 . **acoustic imaging**  
 . . acoustical holography  
 RT acoustic measurement  
 acoustic scattering  
 nondestructive tests

## acoustic impedance

ultrasonic flaw detection

### acoustic impedance

- GS acoustic properties
  - . **acoustic impedance**
  - impedance
  - . **acoustic impedance**
- RT acoustics
  - evanescent waves
  - grazing flow

### acoustic instability

- GS acoustic properties
  - . **acoustic instability**
  - stability
  - . **acoustic instability**
- RT signal fading
  - thermoacoustic effects

### acoustic levitation

DEF Method by which molten materials in space are suspended during processing experiments in the low gravity environment. Also, the use of very intense sound waves to keep a body suspended, thereby eliminating any container contact.

- GS levitation
  - . **acoustic levitation**
- RT buoyancy
  - space processing

### acoustic measurement

- SN (MEASUREMENT OF PROPERTIES, QUANTITIES OR CONDITIONS ASSOCIATED WITH ELASTIC WAVES)
- DEF Measurement of properties, quantities, or conditions of acoustical, i.e., mechanical waves. Used for sound measurement.
- UF *sound measurement*
- GS **acoustic measurement**
  - . noise measurement
- RT acoustic emission
  - acoustic frequencies
  - acoustic imaging
  - ambience
  - anechoic chambers
  - audio frequencies
  - audiometry
  - cepstral analysis
  - effective perceived noise levels
  - frequency measurement
  - grazing flow
- ∞ measurement
  - mechanical measurement
  - noise meters
  - reverberation chambers
  - seismographs
  - sound pressure
  - sound waves
  - ultrasonic tests

### acoustic microscopes

DEF Instruments which use acoustic radiation at microwave frequencies to allow visualization of microscopic detail exhibited in elastic properties of objects. Used for scanning laser acoustic microscope (SLAM).

- UF *scanning laser acoustic microscope (SLAM)*
- GS microscopes
  - . **acoustic microscopes**
- RT acoustic propagation
  - imaging techniques
  - microwave frequencies
  - optical equipment
  - photoacoustic microscopy
  - wave propagation

### acoustic nozzles

- RT ∞ nozzles
  - sonic nozzles
  - sound generators

### acoustic propagation

- GS transmission
  - . wave propagation
  - . . **acoustic propagation**
  - . . . sound propagation
- RT acoustic microscopes
  - acoustical holography
  - acoustics

- elastic waves
- ∞ propagation
  - whispering gallery modes

### acoustic properties

- GS **acoustic properties**
  - . acoustic impedance
  - . acoustic instability
  - . acoustic scattering
  - . . reverberation
  - . acoustic velocity
  - . sound intensity
  - . . zero sound
- RT acoustic frequencies
  - field strength
  - grazing flow
  - Lamb waves
  - mechanical properties
- ∞ physical properties
- ∞ properties
- ∞ resistance
  - sound waves
  - wave dispersion

### acoustic radiation

USE **sound waves**

### acoustic resonance

- (added June 1997)
- GS resonance
  - . **acoustic resonance**
- RT acoustic excitation
  - acoustic frequencies
  - acoustics
  - resonant frequencies
  - resonant vibration

### acoustic retrofitting

DEF Modification, especially of aircraft, to effect noise reduction; specifically, the introduction of absorber materials and jet noise silencers.

- GS retrofitting
  - . **acoustic retrofitting**
- RT absorbers (materials)
  - aerodynamic noise
  - aircraft design
  - aircraft noise
  - jet aircraft noise
  - mufflers
  - noise reduction
  - propeller noise
  - vibration isolators

### acoustic scattering

- GS acoustic properties
  - . **acoustic scattering**
  - . . reverberation
  - scattering
  - . wave scattering
  - . . **acoustic scattering**
  - . . . reverberation
- RT acoustic imaging
  - acoustic sounding
  - acoustics
  - deep scattering layers
  - reciprocity theorem
  - sodar
  - sound detecting and ranging
  - surface noise interactions
  - underwater acoustics

### acoustic simulation

- GS simulation
  - . environment simulation
  - . . **acoustic simulation**
- RT elastic waves
  - flight simulation
  - reverberation chambers

### acoustic sounding

- GS sounding
  - . **acoustic sounding**
- RT acoustic scattering
  - acoustics
  - Earth atmosphere
  - meteorology
  - rocket sounding
  - rocket vehicles
  - sounding rockets

- ultrasonic tests
- underground acoustics
- upper atmosphere

### acoustic stability

USE **frequency stability**

### acoustic streaming

DEF Unidirectional flow currents in a fluid that are due to the presence of sound waves.

- RT fluid flow
  - fluid switching elements
  - fragmentation
  - sound waves
  - streamlining

### acoustic velocity

DEF The speed of propagation of sound waves. Used for sonic speed, sound barrier, and sound velocity.

- UF *sonic speed*
  - sound barrier*
  - sound velocity*
- GS acoustic properties
  - . **acoustic velocity**
  - rates (per time)
  - . **acoustic velocity**
  - velocity
  - . **acoustic velocity**
- RT ∞ barriers
  - exhaust velocity
  - Gutenberg zone
  - Mach cones
  - Mach number
  - sonic booms
  - sound pressure
  - subsonic speed
  - supersonic speed
  - transonic speed

### acoustic vibrations

USE **sound waves**

### acoustical holography

- UF *sonoholography*
  - sound holography*
- GS imagery
  - . photography
  - . . holography
  - . . . **acoustical holography**
  - imaging techniques
  - . acoustic imaging
  - . . **acoustical holography**
- RT acoustic propagation
  - imaging techniques
  - sound waves
  - wave front reconstruction

### acoustics

DEF The study of sound, including its production, transmission, and effects. Those qualities of an enclosure that together determine its character with respect to distinct hearing. Used for sound.

- UF *sound*
- GS **acoustics**
  - . aeroacoustics
  - . . computational aeroacoustics
  - . bioacoustics
  - . electroacoustics
  - . geometrical acoustics
  - . magnetoacoustics
  - . microsonics
  - . psychoacoustics
  - . underwater acoustics
- RT acoustic attenuation
  - acoustic coupling
  - acoustic excitation
  - acoustic fatigue
  - acoustic frequencies
  - acoustic impedance
  - acoustic propagation
  - acoustic resonance
  - acoustic scattering
  - acoustic sounding
  - anechoic chambers
  - architecture
  - audio tapes
  - auditory perception
  - auditory stimuli

- auditory tasks
  - comfort
  - earphones
  - echoes
  - effective perceived noise levels
  - elastic waves
  - harmonic excitation
  - harmonic generations
  - harmonic oscillation
  - harmonics
  - hum
  - infrasonic frequencies
  - Lamb waves
  - Lame wave equations
  - loudness
  - noise (sound)
  - noise pollution
  - noise propagation
  - noise reduction
  - octaves
  - opacity
  - phonetics
  - power spectra
  - ∞ science
  - simple harmonic motion
  - sonic anemometers
  - sound amplification
  - sound fields
  - sound propagation
  - sound transmission
  - sound waves
  - speech
  - stereophonics
  - thermoacoustic effects
  - ultrasonic cleaning
  - ultrasonic scanners
  - ultrasonics
  - verbal communication
  - vibration
  - vibration damping
  - voice communication
  - zero sound
- acousto-optics**
- RT Bragg cells
  - crystal optics
  - electro-optics
  - geometrical optics
  - imagery
  - light modulators
  - magneto-optics
  - optical properties
  - optical switching
  - ∞ optics
  - photoacoustic microscopy
  - photoacoustic spectroscopy
  - thermoacoustic effects
  - tunable filters
- ACPL (Spacelab)*
- USE **Atmospheric Cloud Physics Lab (Spacelab)**
- acquired immunodeficiency syndrome**  
(added August 1991)
- DEF A condition caused by the human immunodeficiency virus (HIV) attacking the human body's T-cells, thereby rendering an infected individual defenseless against diseases.
  - UF *AIDS (disease)*
  - GS diseases
    - . infectious diseases
    - . . viral diseases
    - . . . **acquired immunodeficiency syndrome**
    - signs and symptoms
    - . **acquired immunodeficiency syndrome**
  - RT antibodies
  - hepatitis
  - human immunodeficiency virus
  - immune systems
  - immunology
  - interferon
  - meningitis
  - physiological defenses
  - pneumonia
- vaccines
- acquisition**
- GS **acquisition**
    - . data acquisition
    - . target acquisition
  - RT accumulations
  - collection
  - detection
  - documentation
  - ∞ receiving
  - recognition
- acriflavine**
- GS organic compounds
    - . cyclic compounds
    - . . heterocyclic compounds
    - . . . **acriflavine**
  - RT antiseptics
  - dyes
- acrobatics (aircraft)*
- USE **aerobatics**
- acroleins**
- GS aldehydes
    - . **acroleins**
  - RT toxicity and safety hazard
- acronyms*
- USE **abbreviations**
- ACRV*
- USE **Assured Crew Return Vehicle**
- acrylates**
- GS esters
    - . **acrylates**
  - RT resins
- acrylic acid**
- GS acids
    - . carboxylic acids
    - . . **acrylic acid**
    - organic compounds
    - . carboxylic acids
    - . . **acrylic acid**
- acrylic resins**
- UF *methacrylate resins*
  - polyacrylates*
  - GS plastics
    - . synthetic resins
    - . . addition resins
    - . . . **acrylic resins**
    - resins
    - . synthetic resins
    - . . addition resins
    - . . . **acrylic resins**
  - RT latex
  - polyacrylonitrile
  - thermoplastic resins
- acrylonitriles**
- UF *vinyl cyanide*
  - GS nitrogen compounds
    - . nitriles
    - . . **acrylonitriles**
    - . . . polyacrylonitrile
    - organic compounds
    - . nitriles
    - . . **acrylonitriles**
    - . . . polyacrylonitrile
  - RT plastics
- ACTH*
- USE **adrenocorticotropin (ACTH)**
- actinide series**
- DEF The series of elements beginning with actium, Element No. 89, and continuing through lawrencium, Element No. 103.
  - GS chemical elements
    - . **actinide series**
    - . . actinium
    - . . radium
    - . . . radium isotopes
    - . . . . radium 226
    - . . thorium
    - . . . thorium isotopes
    - . . transuranium elements
- . . . americium
  - . . . . americium isotopes
  - . . . . . americium 241
  - . . . berkelium
  - . . . californium
  - . . . . californium isotopes
  - . . . curium
  - . . . . curium isotopes
  - . . . . . curium 242
  - . . . . . curium 244
  - . . . einsteinium
  - . . . fermium
  - . . . lawrencium
  - . . . mendelevium
  - . . . neptunium
  - . . . . neptunium isotopes
  - . . . nobelium
  - . . . plutonium
  - . . . . plutonium isotopes
  - . . . . . plutonium 238
  - . . . . . plutonium 239
  - . . . . . plutonium 240
  - . . . . . plutonium 241
  - . . . . . plutonium 244
  - . . . sergenium
  - . . . uranium
  - . . . uranium isotopes
  - . . . . uranium 232
  - . . . . uranium 233
  - . . . . uranium 234
  - . . . . uranium 235
  - . . . . uranium 238
  - RT radioactive isotopes
  - radioactive materials
  - transition metals
- actinide series compounds**
- GS **actinide series compounds**
    - . californium compounds
    - . curium compounds
    - . einsteinium compounds
    - . neptunium compounds
    - . plutonium compounds
    - . . plutonium fluorides
    - . . plutonium oxides
    - . thorium compounds
    - . . thorium fluorides
    - . . thorium oxides

## actinium

- . uranium compounds
- . . uranium carbides
- . . uranium fluorides
- . . uranium oxides
- RT ∞ chemical compounds
- ∞ Group 3B compounds

### actinium

- GS chemical elements
- . actinide series
- . . **actinium**
- metals
- . actinide series
- . . **actinium**

### actinographs

- USE **actinometers**

### actinometers

DEF The general name for instruments used to measure the intensity of radiant energy, particularly that of the sun. Used for actinographs and emissographs.

- UF *actinographs*
- emissographs*
- GS measuring instruments
- . radiation measuring instruments
- . . **actinometers**
- . . . infrared spectrometers
- . . . . filter wheel infrared spectrometers
- . . . . pyranometers
- . . . . radiometers
- . . . . Dicke radiometers
- . . . . infrared detectors
- . . . . FLIR detectors
- . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners
- . . . . . visible infrared spin scan radiometer
- . . . . . quantum well infrared photodetectors
- . . . . . microwave radiometers
- . . . . . Advanced Microwave Sounding Unit
- . . . . . passive L-band radiometers
- . . . . . pressure modulator radiometers
- . . . . . spectroradiometers
- . . . . . MISR (radiometry)
- . . . . . MODIS (radiometry)
- . . . . . solar spectrometers
- . . . . . spectroheliographs
- . . . . . spectrophotometers
- . . . . . infrared spectrophotometers
- . . . . . ultraviolet spectrophotometers
- . . . . . ultraviolet detectors
- . . . . . ultraviolet spectrometers
- . . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . . . . ultraviolet spectrophotometers
- . . . . . x ray detectors
- RT dosimeters
- Fabry-Perot spectrometers
- field intensity meters
- spectrometers

### actinomycetes

- GS microorganisms
- . bacteria
- . . **actinomycetes**

### actinomycin

- GS drugs
- . antibiotics
- . . **actinomycin**

### activated carbon

- GS charcoal
- . **activated carbon**
- RT ∞ absorption
- carbon
- filtration
- hemoperfusion
- water treatment

### activated sludge

DEF A semiliquid mass removed from the

liquid flow of sewage and subjected to aeration and aerobic microbial action. The end product is dark to golden brown, partially decomposed, granular and flocculent, and has an earthy odor when fresh.

- GS sludge
- . **activated sludge**
- RT biodegradation
- human wastes
- metabolic wastes
- sewage
- wastes

### activation

- RT actuation
- catalysis
- deactivation
- electromagnetic absorption
- excitation
- flotation
- initiation
- ionization potentials
- irradiation
- microwave absorption
- sensitizing
- starting
- stimulation

### activation (biology)

- RT activation energy
- ∞ biology
- ∞ cells
- enzymes
- stimulation

### activation analysis

DEF A method of chemical analysis, especially for small traces of materials, based on the detection of characteristic radiations following a nuclear bombardment.

- GS **activation analysis**
- . neutron activation analysis
- RT ∞ analyzing

### activation energy

- RT activation (biology)
- binding energy
- Damkohler number
- electron energy
- ∞ energy
- heat
- nuclear binding energy
- nuclear capture
- proton energy
- rotons
- surface energy

### active control

DEF The automatic activation of various control surface functions in aircraft.

- GS automatic control
- . adaptive control
- . . **active control**
- RT aeroservoelasticity
- aircraft control
- ∞ control
- interactive control
- piezoelectric actuators
- self adaptive control systems
- self alignment
- servomechanisms
- smart structures

### active galactic nuclei

- GS galactic nuclei
- . **active galactic nuclei**
- RT active galaxies
- blazars
- galactic radiation
- ∞ nuclei
- quasars
- radio galaxies
- Seyfert galaxies

### active galaxies

- GS celestial bodies
- . galaxies
- . . **active galaxies**
- . . . Markarian galaxies
- . . . radio galaxies

- . . . Seyfert galaxies
- RT active galactic nuclei
- blazars
- galactic nuclei
- galactic radiation
- quasars

### active glaciers

- USE **glaciers**

### Active Magneto Particle Tracer Explorers

- USE **AMPTE (satellites)**

### active satellites

DEF Satellites which transmit a signal, in contrast to passive satellites.

- GS artificial satellites
- . **active satellites**
- . . SYNCOM satellites
- . . . Early Bird satellites
- . . . SYNCOM 1 satellite
- . . . SYNCOM 2 satellite
- . . . SYNCOM 3 satellite
- . . . SYNCOM 4 satellite
- RT Advent Project
- Explorer 29 satellite
- Explorer 36 satellite
- geodetic satellites
- GEOS 1 satellite
- GEOS 2 satellite
- GEOS 3 satellite
- navigation satellites
- NAVSTAR satellites
- passive satellites
- synchronous satellites

### active sites (chemistry)

(added August 2004)

DEF The reactive parts of a molecule that directly participate in its specific combination with another molecule.

- UF *binding sites*
- catalytic sites*
- reactive centers*
- RT binding energy
- catalytic activity
- chemical bonds
- enzyme inhibitors

### active volcanoes

- USE **volcanoes**

### ∞ activity

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT activity (biology)
- extravehicular activity
- faculae
- intravehicular activity
- radioactivity
- solar activity

### activity (biology)

- UF *biological activity*
- RT ∞ activity
- biological effects
- ∞ biology
- catalytic activity

### activity cycles (biology)

- GS cycles
- . **activity cycles (biology)**
- RT ∞ biology
- circadian rhythms
- phenology
- photoperiod
- rhythm (biology)
- zeitgebers

### ACTS

- SN (ADVANCED COMMUNICATIONS TECHNOLOGY SATELLITE)
- UF *Advanced Communications Technology Sat*
- GS artificial satellites
- . communication satellites
- . . **ACTS**
- RT extremely high frequencies
- microwave transmission

- satellite communication
- actuation**  
 RT activation  
 actuators  
 excitation  
 initiation  
 nutation  
 sensitizing  
 starting  
 stimulation
- actuator disks**  
 GS disks (shapes)  
 . **actuator disks**  
 RT ∞ disks  
 ∞ fans  
 propellers
- actuators**  
 DEF Mechanisms to activate process control equipment, e.g., valves. Used for cartridge actuated devices, hydraulic actuators, and triggers.  
 UF *cartridge actuated devices*  
*hydraulic actuators*  
*triggers*  
 GS **actuators**  
 . piezoelectric actuators  
 RT actuation  
 aeroservoelasticity  
 aircraft hydraulic systems  
 automatic control valves  
 cams  
 control valves  
 controllers  
 ∞ effectors  
 electroactive polymers  
 explosive devices  
 ∞ instruments  
 microoptoelectromechanical systems  
 missile control  
 propellant actuated instruments  
 regulators  
 servomechanisms  
 servomotors  
 shape control  
 smart materials  
 solenoids  
 starters  
 stepping motors  
 torque motors
- acuity**  
 DEF The keenness of ability to detect and discriminate.  
 GS **acuity**  
 . visual acuity  
 . . hyperopia  
 RT adaptation  
 discrimination  
 frequency response  
 perception  
 sensitivity  
 thresholds (perception)
- acylation**  
 GS chemical reactions  
 . **acylation**  
 . . acetylation  
 RT Friedel-Craft reaction
- AD/I B  
 USE **Explorer 25 satellite**
- AD/I satellite  
 USE **Explorer 24 satellite**
- Ada (programming language)**  
 DEF A programming language based on PASCAL, originally developed on behalf of the US Department of Defense for use in embedded computer systems. It is named Ada in honor of Augusta Ada Byron, countess of Lovelace, primarily due to the fact that she was the assistant and patron of Charles Babbage and is considered the world's first programmer.  
 GS languages  
 . programming languages  
 . . high level languages
- . . . **Ada (programming language)**  
 RT computer programming  
 embedded computer systems  
 object-oriented programming
- AD-A satellite  
 USE **Explorer 19 satellite**
- adaptation**  
 DEF The adjustment, alteration or modification of an organism to fit it more perfectly for existence in its environment.  
 GS **adaptation**  
 . acclimatization  
 . . altitude acclimatization  
 . . cold acclimatization  
 . . heat acclimatization  
 . desert adaptation  
 . retinal adaptation  
 . . dark adaptation  
 . . light adaptation  
 RT accommodation  
 acuity  
 correction  
 fitting  
 hibernation  
 homeostasis  
 perception  
 reaction time  
 retraining  
 sensitivity  
 thresholds (perception)  
 vision
- adapters**  
 DEF Devices or contrivances used or designed primarily to fit or adjust one thing to another. Devices, appliances or the like used to alter something so as to make it suitable for a use for which it was not originally designed.  
 GS **adapters**  
 . multiple docking adapters  
 RT connectors  
 extensions  
 fittings  
 joints (junctions)
- adaptive control**  
 UF *adaptive control systems*  
 GS automatic control  
 . **adaptive control**  
 . . active control  
 . . model reference adaptive control  
 . . self adaptive control systems  
 RT automata theory  
 autonomy  
 ∞ control  
 control theory  
 cybernetics  
 dynamic control  
 feedback control  
 feedforward control  
 machine learning  
 mission adaptive wings  
 optimal control  
 robot control  
 sampled data systems  
 self alignment  
 smart structures
- adaptive control systems*  
 USE **adaptive control**
- adaptive filters**  
 RT bandpass filters  
 bandstop filters  
 electric filters  
 electromagnetic wave filters  
 ∞ filters  
 IIR filters  
 linear filters  
 optical filters  
 space-time adaptive processing  
 tracking filters  
 tunable filters
- adaptive optics**  
 DEF Real-time optical correction for atmospheric perturbations and other system error sources.
- RT anisoplanatism  
 atmospheric optics  
 computer techniques  
 deformable mirrors  
 feedback control  
 honeycomb mirrors  
 imaging techniques  
 instrument compensation  
 laser guide stars  
 optical correction procedure  
 optical transfer function  
 ∞ optics  
 segmented mirrors  
 self adaptive control systems
- adatoms**  
*(added September 2002)*  
 DEF Atoms adsorbed on a solid surface. Adatoms and their associated properties are often exploited in the development of microelectronic and nanoelectronic structures.  
 UF *adsorbed atoms*  
 GS atoms  
 . **adatoms**  
 RT adsorption  
 atomic clusters  
 chemisorption  
 metal surfaces  
 molecular electronics  
 nanostructures (devices)  
 nanotechnology  
 surface diffusion
- adders (circuits)*  
 USE **adding circuits**
- adding circuits**  
 UF *adders (circuits)*  
*binary summators*  
 GS circuits  
 . **adding circuits**  
 computer components  
 . **adding circuits**  
 RT accumulators (computers)  
 binary integration  
 logic circuits
- addition**  
 RT addition theorem  
 amount  
 arithmetic  
 computation  
 number theory  
 restoration
- addition resins**  
 SN (CARBON CHAIN POLYMERS--FOR HETEROATOM CHAIN POLYMERS, USE POLYETHER RESINS)  
 GS plastics  
 . synthetic resins  
 . . **addition resins**  
 . . . acrylic resins  
 . . . vinyl copolymers  
 resins  
 . synthetic resins  
 . . **addition resins**  
 . . . acrylic resins  
 . . . vinyl copolymers  
 RT crosslinking  
 polybutadiene  
 polyethylene terephthalate  
 polyethylenes  
 polyisobutylene  
 polypropylene  
 polystyrene  
 polyvinyl alcohol  
 polyvinyl chloride  
 synthesis (chemistry)  
 synthetic fibers  
 vulcanized elastomers
- addition theorem**  
 GS number theory  
 . **addition theorem**  
 theorems  
 . **addition theorem**  
 RT addition
- additives**  
 DEF Materials or substances added to

## addressing

something else for a specific purpose. Used for doping (additives).

UF *doping (additives)*

GS **additives**

- . admixtures
- . antifreezes
- . antiicing additives
- . antiknock additives
- . antioxidants
- . oil additives
- . opacifiers
- . plasticizers
- . propellant additives
- . . . propellant binders
- . . . solid rocket binders

RT ∞ agents

- alloying
- antimisting fuels
- binders (materials)
- carrier injection
- catalysts
- coatings
- diluents
- dopes
- doping (materials)
- fillers
- high energy fuels
- inhibitors
- interstitials
- lubricants
- majority carriers
- minority carriers
- modulation doping
- neutralizers
- neutron transmutation doping
- pigments
- preservatives
- retardants
- solvents
- stabilizers (agents)
- suppressors
- tetrahydrofuran
- thickeners (materials)
- traveling solvent method
- vinyl copolymers

## addressing

RT coding

computer programming

## adducts

DEF Chemical compounds with weak bonds, e.g., occlusive or Van der Waal bonds.

RT ∞ chemical compounds

## Aden

USE **Southern Yemen**

## adenines

GS bases (chemical)

- . **adenines**
- organic compounds
- . carbohydrates
- . . . glucosides
- . . . nucleosides
- . . . . **adenines**
- . cyclic compounds
- . . heterocyclic compounds
- . . . purines
- . . . . **adenines**
- . nucleotides
- . . **adenines**
- phosphorus compounds
- . phosphates
- . . **adenines**

RT ribonucleic acids

## adenosine diphosphate

UF *ADP*

GS organic compounds

- . coenzymes
- . . **adenosine diphosphate**
- . cyclic compounds
- . . heterocyclic compounds
- . . . adenosines
- . . . . **adenosine diphosphate**
- . nucleotides
- . . adenosines
- . . . **adenosine diphosphate**
- phosphorus compounds

- . phosphates
- . . diphosphates
- . . . **adenosine diphosphate**

## adenosine monophosphate

(added August 2004)

DEF Adenine nucleotide containing one phosphate group.

UF *adenylic acid*

*AMP (biochemistry)*

GS organic compounds

- . cyclic compounds
- . . heterocyclic compounds
- . . . adenosines
- . . . . **adenosine monophosphate**
- . nucleotides
- . . adenosines
- . . . **adenosine monophosphate**
- phosphorus compounds
- . phosphates
- . . **adenosine monophosphate**

RT adenosine triphosphate

cyclic AMP

deoxyribonucleic acid

metabolism

## adenosine triphosphate

UF *ATP*

GS organic compounds

- . coenzymes
- . . **adenosine triphosphate**
- . cyclic compounds
- . . heterocyclic compounds
- . . . adenosines
- . . . . **adenosine triphosphate**
- . nucleotides
- . . adenosines
- . . . **adenosine triphosphate**
- phosphorus compounds
- . phosphates
- . . **adenosine triphosphate**

RT adenosine monophosphate

amino acids

myosins

## adenosines

GS organic compounds

- . cyclic compounds
- . . heterocyclic compounds
- . . . **adenosines**
- . . . . adenosine diphosphate
- . . . . adenosine monophosphate
- . . . . adenosine triphosphate
- . . . . cyclic AMP
- . nucleotides
- . . **adenosines**
- . . . adenosine diphosphate
- . . . adenosine monophosphate
- . . . adenosine triphosphate
- . . . cyclic AMP

RT oligonucleotides

## adenosinetriphosphatase

(added August 2004)

RT myosins

## adenoviruses

GS microorganisms

- . viruses
- . . **adenoviruses**

## adenylic acid

(added December 2004)

USE **adenosine monophosphate**

## adequacy

RT quality

validity

## adherometers

USE **adhesion tests**

## adhesion

GS surface properties

- . **adhesion**
- . . stiction

RT adhesion tests

adhesive bonding

agglutination

bonding

- cold welding
- fusion (melting)
- interfacial energy
- internal pressure

∞ joining

- metal bonding
- peeling
- sealing
- spreading
- tackiness
- traction
- wettability

## adhesion tests

UF *adherometers*

*Fokker bond testers*

RT adhesion

- bonding
- nondestructive tests

∞ tests

wettability

## adhesive bonding

GS bonding

- . **adhesive bonding**

RT adhesion

- agglutination
- bonded joints
- cementation
- fiber pullout

∞ joining

- metal bonding
- metal-metal bonding
- resin bonding
- sealing

## adhesives

UF *binders (adhesives)*

GS **adhesives**

- . glues
- . pastes

RT agglutination

- alkyd resins
- binders (materials)
- cements
- epoxy resins
- fasteners
- furan resins
- joints (junctions)
- metal-metal bonding
- phenolic epoxy resins
- plastic tapes
- sealers
- seams (joints)

∞ tapes

## ADI methods

USE **alternating direction implicit methods**

## adiabatic conditions

GS conditions

- . **adiabatic conditions**

RT Carnot cycle

compressing

enthalpy

environments

expansion

isentrope

isoenergetic processes

isothermal processes

polytropic processes

temperature

thermal environments

thermodynamic cycles

thermodynamic equilibrium

## adiabatic demagnetization cooling

DEF Use of paramagnetic salts cooled to the boiling point of helium in a strong magnetic field, then thermally isolated and removed from the field to demagnetize the salts and attain temperatures of 10(-3) K.

RT magnetic cooling

## adiabatic equations

RT ∞ equations

equations of state

heat transmission

- nonadiabatic theory  
shock waves
- adiabatic flow**  
GS fluid flow  
  . **adiabatic flow**  
RT stagnation temperature
- adipose tissues**  
GS tissues (biology)  
  . connective tissue  
  . . **adipose tissues**  
RT fats
- Adiprene (trademark)**  
GS elastomers  
  . rubber  
  . . synthetic rubbers  
  . . . **Adiprene (trademark)**
- Adirondack Mountains (NY)**  
GS landforms  
  . mountains  
  . . **Adirondack Mountains (NY)**  
RT New York
- adjoints**  
GS algebra  
  . vector spaces  
  . . matrices (mathematics)  
  . . . **adjoints**  
RT data processing  
  numerical analysis
- adjusting**  
UF *adjustment*  
  *readjustment*  
RT alignment  
  clearances  
  collimation  
  correction  
  fitting  
  focusing  
  leveling  
  matching  
  optical correction procedure  
  positioning  
  revisions  
∞ setting  
  smoothing
- adjustment*  
USE **adjusting**
- administration*  
USE **management**
- admittance*  
USE **electrical impedance**
- admixtures**  
GS additives  
  . **admixtures**  
  mixtures  
  . **admixtures**  
RT accelerating agents  
  catalysts  
∞ combination  
  concretes  
  formulations  
  ingredients  
  mixers  
  mortars (material)  
  surfactants
- adobe flats*  
USE **flats (landforms)**
- ADP**  
USE **adenosine diphosphate**
- Adrastea**  
(added January 1996)  
DEF A natural satellite of Jupiter orbiting at a mean distance of 129,980 kilometers.  
GS celestial bodies  
  . natural satellites  
  . . Jupiter satellites  
  . . . **Adrastea**
- RT Jupiter (planet)
- adrenal gland**  
GS anatomy  
  . glands (anatomy)  
  . . endocrine glands  
  . . . **adrenal gland**  
RT adrenocorticotropin (ACTH)  
  epinephrine  
  glucocorticoids
- adrenal metabolism**  
GS metabolism  
  . **adrenal metabolism**  
RT aldosterone  
  corticosteroids  
  cortisone  
  hydrocortisone
- adrenaline*  
USE **epinephrine**
- adrenergics**  
UF *sympathomimetics*  
GS drugs  
  . **adrenergics**  
RT antiadrenergics  
  anticoagulants  
  cyclic AMP
- adrenocorticotropin (ACTH)**  
UF *ACTH*  
GS secretions  
  . endocrine secretions  
  . . hormones  
  . . . pituitary hormones  
  . . . . **adrenocorticotropin (ACTH)**  
RT acids  
  adrenal gland  
  amino acids  
  proteins
- Adriatic Sea**  
GS seas  
  . Mediterranean Sea  
  . . **Adriatic Sea**  
RT Italy  
  Yugoslavia
- adsorbed atoms*  
(added September 2002)  
USE **adatoms**
- adsorbents**  
DEF Materials which take up gases by adsorption.  
GS sorbents  
  . **adsorbents**  
RT absorbents  
  adsorption  
  air conditioning equipment  
  charcoal  
  desiccants  
  hemoperfusion
- adsorption**  
DEF The adhesion of a thin film of liquid or gas to the surface of a solid substance. The solid does not combine chemically with the adsorbed substance.  
GS sorption  
  . **adsorption**  
  . . chemisorption  
RT ∞ absorption  
  adatoms  
  adsorbents  
  adsorptivity  
  beneficiation  
  bioavailability  
  chromatography  
  concentrating  
  desorption  
  diffusion  
  electrostatic precipitators  
  elution  
  gas chromatography  
  gas-metal interactions  
  Gibbs adsorption equation  
  hydrophobicity  
∞ separation
- water treatment
- adsorptivity**  
GS surface properties  
  . **adsorptivity**  
RT adsorption  
  chemical properties  
  chemisorption  
  ∞ physical properties
- adults**  
(added August 2004)  
DEF A person having attained full growth or maturity.  
RT children  
  demography  
  females  
  males  
  parents  
  populations  
  youth
- Advanced Airborne Command Post*  
USE **E-4A aircraft**
- Advanced Communications Technology Sat*  
USE **ACTS**
- Advanced Composition Explorer**  
(added December 1999)  
DEF Explorer spacecraft (launched August 25, 1997) carrying six high-resolution sensors and three monitoring instruments for sampling low-energy particles of solar origin and high-energy galactic particles. From a vantage point approximately 1/100 of the distance from the Earth to the Sun, the Advanced Composition Explorer (ACE) can perform measurements over a wide range of energy and nuclear mass, under all solar wind flow conditions and during both large and small particle events including solar flares. When reporting space weather ACE can provide an advance warning of geomagnetic storms.  
UF *ACE satellite*  
  *Explorer 71 satellite*  
GS artificial satellites  
  . scientific satellites  
  . . Explorer satellites  
  . . . **Advanced Composition Explorer**  
RT energetic particles  
  galactic cosmic rays  
  interplanetary medium  
  solar corpuscular radiation  
  solar cosmic rays  
  solar wind  
  space weather
- Advanced EVA Protection Systems*  
USE **AEPS**
- Advanced Launch System (STS)**  
(added October 1989)  
UF *ALS (launch system)*  
GS transportation  
  . space transportation  
  . . space transportation system  
  . . . **Advanced Launch System (STS)**  
RT heavy lift launch vehicles  
  launch vehicle configurations  
  launch vehicles  
  NASA programs  
  NASA space programs  
  payload delivery (STS)  
  reusable launch vehicles  
  Shuttle Derived Vehicles  
  space shuttles  
  spacecraft design
- Advanced Microwave Sounding Unit**  
(added July 1997)  
DEF A line-scan instrument on the Advanced TIROS-N (ATN) NOAA K-N series of operational meteorological satellites. The AMSU consists of two functionally independent units, AMSU-A and AMSU-B. The AMSU-A is designed to measure scene radiance in 15 channels, ranging from 23. 8 to 89 GHz, to derive



## Advanced Range Instrumentation Aircraft

atmospheric temperature profiles from the Earth surface to about 3 millibar pressure height. The AMSU-B is designed to measure scene radiance in five channels, ranging from 89 GHz to 183 GHz for the computation of atmospheric water vapor profiles.

- UF *AMSU (radiometer)*
- GS measuring instruments
  - . microwave sensors
  - .. **Advanced Microwave Sounding Unit**
    - . radiation measuring instruments
    - . . actinometers
    - . . . radiometers
    - . . . . microwave radiometers
    - . . . . . **Advanced Microwave Sounding Unit**
    - . satellite-borne instruments
    - .. **Advanced Microwave Sounding Unit**
      - microwave equipment
      - . microwave radiometers
      - .. **Advanced Microwave Sounding Unit**
- RT atmospheric moisture
  - atmospheric sounding
  - atmospheric temperature
  - Earth Observing System (EOS)
  - microwave sounding
  - NOAA 19 satellite
  - NOAA satellites
  - remote sensors
  - satellite sounding
  - TIROS N series satellites

*Advanced Orbiting Solar Observatory*  
USE **AOSO**

### Advanced Range Instrumentation Aircraft

- DEF An EC-135 aircraft configured for reception recording and real-time relay of telemetry data.
- RT airborne equipment
  - ∞ aircraft
  - Apollo project
  - C-135 aircraft
  - data acquisition
  - telemetry

### Advanced Range Instrumentation Ship

- UF *ARIS instrumentation ship*
- GS water vehicles
  - . ships
  - .. **Advanced Range Instrumentation Ship**
- RT ∞ instruments
  - manned space flight network
  - spacecraft tracking
  - tracking networks

### Advanced Recon Electric Spacecraft

- UF *ARES (spacecraft)*
- GS interplanetary spacecraft
  - . Mars probes
  - .. **Advanced Recon Electric Spacecraft**
    - unmanned spacecraft
    - . space probes
    - .. Mars probes
    - . . . **Advanced Recon Electric Spacecraft**
- RT ∞ spacecraft

### advanced sodium cooled reactor

- UF *ASCR reactor*
- GS nuclear reactors
  - . liquid cooled reactors
  - .. liquid metal cooled reactors
  - . . . **advanced sodium cooled reactor**

### Advanced Solid Rocket Motor (STS)

- (added October 1989)
- UF *ASRM (STS)*
- GS engines
  - . rocket engines
  - .. booster rocket engines
  - . . . Space Shuttle Boosters
  - . . . . **Advanced Solid Rocket Motor (STS)**

- . . solid propellant rocket engines
- . . . Space Shuttle Boosters
- . . . . **Advanced Solid Rocket Motor (STS)**
- RT Space Shuttle Ascent Stage
  - space transportation system

*advanced tactical fighter*

USE **F-22 aircraft**

### Advanced Technology Laboratory

DEF An all-pallet payload utilizing the Space Shuttle and the European Spacelab and designed to accommodate 8 to 15 experiments per mission.

- GS laboratories
  - . space laboratories
  - .. **Advanced Technology Laboratory**
    - payloads
    - . Space Shuttle payloads
    - .. **Advanced Technology Laboratory**
- RT Spacelab

*Advanced Technology Light Twin aircraft*

USE **ATLIT project**

### advanced test reactors

- UF *ATR reactor*
- GS nuclear reactors
  - . nuclear research and test reactors
  - .. **advanced test reactors**

### Advanced Very High Resolution Radiometer

(added July 1988)

DEF A five channel scanning instrument that quantitatively measures electromagnetic radiation.

- UF *AVHRR*
- GS measuring instruments
  - . radiation measuring instruments
  - . . actinometers
  - . . . radiometers
  - . . . . infrared detectors
  - . . . . . infrared radiometers
  - . . . . . **Advanced Very High Resolution Radiometer**
  - . . infrared instruments
  - . . . infrared detectors
  - . . . . infrared radiometers
  - . . . . . **Advanced Very High Resolution Radiometer**
  - . satellite-borne instruments
  - .. **Advanced Very High Resolution Radiometer**
- RT infrared instruments
  - NOAA 6 satellite
  - NOAA 7 satellite
  - NOAA 8 satellite
  - NOAA 11 satellite
  - NOAA 12 satellite
  - remote sensors
  - TIROS N series satellites

### Advanced Vidicon Camera System (AVCS)

- UF *AVCS*
- GS communication equipment
  - . **Advanced Vidicon Camera System (AVCS)**
    - television systems
    - . **Advanced Vidicon Camera System (AVCS)**
- RT ∞ systems
  - video equipment
  - vidicons

*Advanced X Ray Astrophysics Facility*

USE **X Ray Astrophysics Facility**

*advancing glaciers*

USE **glaciers**

*advancing shorelines*

USE **beaches**

### advection

DEF The process of transport of an atmospheric property solely by the mass motion of the atmosphere; also, the rate of change of the

value of the advected property at a given point.

- RT atmospheric circulation
  - convection
  - heat transfer
  - mixing layers (fluids)
  - Peclet number

### Advent Project

- GS programs
  - . projects
  - .. **Advent Project**
- RT active satellites
  - communication satellites
  - Courier satellite
  - Relay satellites

*AE-A satellite*

USE **Explorer 17 satellite**

*AE-B satellite*

USE **Explorer 32 satellite**

*AE-C satellite*

USE **Explorer 51 satellite**

*AE-D satellite*

USE **Explorer 54 satellite**

*AE-E satellite*

USE **Explorer 55 satellite**

### aeolian tones

- RT elastic waves
  - frequencies
  - Karman vortex street
  - noise (sound)
  - sound waves
  - wind (meteorology)

### aeotropism

- GS tropism
  - . **aeotropism**
- RT anisotropy

### AEPS

- UF *Advanced EVA Protection Systems*
- GS support systems
  - . life support systems
  - . . emergency life sustaining systems
  - . . . **AEPS**
  - . . portable life support systems
  - . . . **AEPS**
- RT Columbus space station
  - extravehicular activity
  - lunar bases
  - Mars landing
  - oxygen supply equipment
  - space shuttles
  - space stations
  - survival equipment

### aeration

- RT agitation
  - beneficiation
  - blowing
  - bubbles
  - corrosion prevention
  - degassing
  - dissolved gases
  - dissolving
  - entrainment
  - mixers
  - mixing
  - oxygenation
  - purification
  - ∞ separation
  - spraying
  - stirring
  - suspending (mixing)
  - water treatment

*aerial acrobatics*

USE **aerobatics**

### aerial explosions

- SN (LIMITED TO EXPLOSIONS OCCURRING AT HEIGHTS LESS THAN 50 KM)
- UF *air blasts*
- GS explosions
  - . **aerial explosions**
- RT blast loads

chemical explosions  
nuclear explosions  
thermonuclear explosions

*aerial imagery*

USE **aerial photography**

**aerial photography**

UF *aerial imagery*  
GS imagery  
. photography  
. . **aerial photography**  
RT astronomical photography  
change detection  
cloud photographs  
cloud photography  
color photography  
Earth observations (from space)  
Earth Resources Survey aircraft  
forest fire detection  
geographic information systems  
gray scale  
ground truth  
ice mapping  
image motion compensation  
infrared photography  
orthophotography  
photogeology  
photogrammetry  
photointerpretation  
photomapping  
photomaps  
pixels  
plant stress  
rocket-borne photography  
satellite-borne photography  
sea truth  
spaceborne photography  
stereophotography  
timber inventory  
ultraviolet photography

**aerial reconnaissance**

GS reconnaissance  
. **aerial reconnaissance**  
. . Airborne Integrated  
Reconnaissance System  
RT aeromagnetism  
change detection  
Earth Resources Survey aircraft  
ground truth  
HS-801 aircraft  
infrared radiometers  
meteorological flight  
photoreconnaissance  
reconnaissance aircraft  
reconnaissance spacecraft  
thermal mapping  
unmanned aircraft systems

**aerial rudders**

GS airfoils  
. **aerial rudders**  
control surfaces  
. rudders  
. . **aerial rudders**  
RT fins  
horizontal tail surfaces  
marine rudders  
stabilizers (fluid dynamics)  
tabs (control surfaces)  
tail assemblies

**aeroacoustics**

GS acoustics  
. **aeroacoustics**  
. . computational aeroacoustics  
RT aerodynamics  
∞ aeronautics  
aircraft noise  
Flowcs Williams-Hawkings equation  
flow noise  
grazing flow  
noise prediction (aircraft)  
propeller noise  
∞ science  
screech tones  
space-time CE/SE method

surface noise interactions

**aeroassist**

DEF Changing orbit size by utilizing aerobraking, aerocapture, or aeromaneuvering.  
RT aerobraking  
aerocapture  
aeromaneuvering  
atmospheric entry  
interplanetary transfer orbits  
transfer orbits

**aerobatics**

UF *acrobatics (aircraft)*  
*aerial acrobatics*  
*stunt flying*  
RT flight control  
formation flying  
maneuvers

**Aerobee rocket vehicle**

GS rocket vehicles  
. sounding rockets  
. . **Aerobee rocket vehicle**

**aerobes**

RT anaerobes  
bacteria  
microorganisms  
sewage treatment

**aerobiology**

DEF The study of the distribution of living organisms freely suspended in the atmosphere.  
RT air pollution  
airborne infection  
∞ biology  
environment pollution  
pollen

**aerobraking**

DEF Changing orbit size by using the upper atmosphere to create drag.  
RT aeroassist  
aerocapture  
aeromaneuvering  
interplanetary transfer orbits  
transfer orbits

**aerocapture**

DEF Making use of the atmosphere of a planet or planetary satellite by capturing the object and reducing the orbit size so that it remains in orbit or lands on the body.  
RT aeroassist  
aerobraking  
aeromaneuvering  
atmospheric entry  
interplanetary transfer orbits  
transfer orbits

*aerodontalgia*

USE **tooth diseases**

*aerodynamic axis*

USE **aerodynamic balance**

**aerodynamic balance**

UF *aerodynamic axis*  
*aerodynamic center*  
*drag balance*  
*trim (balance)*  
GS aerodynamic characteristics  
. **aerodynamic balance**  
balance  
. **aerodynamic balance**  
RT aircraft stability  
dynamic characteristics  
horizontal flight  
lift drag ratio  
mass distribution  
spacecraft motion  
spacecraft stability  
static aerodynamic characteristics  
turning flight

**aerodynamic brakes**

GS brakes (for arresting motion)  
. **aerodynamic brakes**  
. . ballutes  
. . drag chutes

. . split flaps  
. . wing flaps  
. . . leading edge flaps  
. . . leading edge slats  
. . . trailing edge flaps  
. . . vortex flaps  
drag devices  
. **aerodynamic brakes**  
. ballutes  
. drag chutes  
. split flaps  
. wing flaps  
. . leading edge flaps  
. . leading edge slats  
. . trailing edge flaps  
. . vortex flaps

RT

aircraft brakes  
control surfaces  
flaperons  
flaps (control surfaces)  
parachutes  
parafoils  
retractable equipment  
spoilers

*aerodynamic buzz*

USE **flutter**

*aerodynamic center*

USE **aerodynamic balance**

**aerodynamic characteristics**

GS **aerodynamic characteristics**  
. aerodynamic balance  
. aerodynamic drag  
. supersonic drag  
. aerodynamic stability  
. interference drag  
. lift  
. interference lift  
. jet lift  
. rotor lift  
. zero lift  
. static aerodynamic characteristics  
RT aerodynamic noise  
angle of attack  
aspect ratio  
∞ characteristics  
cross flow  
dynamic characteristics  
engine airframe integration  
flight envelopes  
induced drag  
rotor body interactions  
under surface blowing  
unsteady aerodynamics  
upper surface blowing  
wind tunnel tests

*aerodynamic chords*

USE **airfoil profiles**  
**chords (geometry)**

**aerodynamic coefficients**

DEF Any nondimensional coefficients relating to aerodynamic forces or moments, such as a coefficient of drag, a coefficient of lift, etc. Used for lift coefficients.  
UF *lift coefficients*  
GS coefficients  
. **aerodynamic coefficients**  
RT ∞ drag coefficients  
flow coefficients  
flow distortion  
force distribution  
lift  
lift drag ratio  
pitching moments  
pressure distribution  
rolling moments  
yawing moments

**aerodynamic configurations**

SN (LIMITED TO AERODYNAMIC VEHICLE SHAPES--FOR LIFTING OR THRUSTING SURFACES USE AIRFOILS)  
GS **aerodynamic configurations**  
. body-wing and tail configurations  
. body-wing configurations  
. blended-wing-body configurations  
. aeroshells

## aerodynamic drag

- . canard configurations
- . drooped airfoils
- . waveriders
- . wing nacelle configurations
- RT aircraft configurations
- aircraft design
- airfoils
- blunt bodies
- bodies of revolution
- channel wings
- cones
- ∞ configurations
- control surfaces
- ∞ design
- disks (shapes)
- drag
- engine airframe integration
- fairings
- finned bodies
- half cones
- ∞ hemispheres
- intake systems
- launch vehicle configurations
- lift
- lifting bodies
- missile configurations
- monoplanes
- nacelles
- nose tips
- oblique wings
- propulsion system configurations
- protuberances
- pylon mounting
- Reynolds equation
- ring structures
- rotor body interactions
- satellite configurations
- scale models
- semispan models
- slender bodies
- slender cones
- spacecraft configurations
- spheres
- strakes
- streamlined bodies
- three dimensional bodies
- wedges
- wind tunnel models
- wing roots

### aerodynamic drag

- GS aerodynamic characteristics
- . **aerodynamic drag**
- . . . supersonic drag
- aerodynamic forces
- . **aerodynamic drag**
- . . . supersonic drag
- dynamic characteristics
- . drag
- . . friction drag
- . . . **aerodynamic drag**
- . . . . supersonic drag
- friction
- . flow resistance
- . . friction drag
- . . . **aerodynamic drag**
- . . . . supersonic drag
- . skin friction
- . . friction drag
- . . . **aerodynamic drag**
- . . . . supersonic drag

- RT ballistics
- base pressure
- ∞ drag coefficients
- drag measurement
- drag reduction
- ground effect (aerodynamics)
- hypersonic forces
- induced drag
- lift
- lift drag ratio
- orbit decay
- pressure drag
- ∞ resistance
- satellite drag
- turbulence
- vortex flaps

### aerodynamic forces

DEF The force exerted by a moving gas-

eous fluid upon a body completely immersed in it. Used for Glauert coefficient.

- UF *Glauert coefficient*
- GS **aerodynamic forces**
- . aerodynamic drag
- . . supersonic drag
- . aerodynamic interference
- . aerodynamic loads
- . . blast loads
- . . gust loads
- . hypersonic forces
- . lift
- . . interference lift
- . . jet lift
- . . rotor lift
- . . zero lift
- . wing loading

- RT ∞ force
- leading edge thrust
- thrust distribution
- unsteady aerodynamics

### aerodynamic heat transfer

- GS transmission
- . heat transmission
- . . heat transfer
- . . . **aerodynamic heat transfer**
- . . . . hypersonic heat transfer
- . . . . supersonic heat transfer
- RT ablation
- aerothermodynamics
- turbulent heat transfer

### aerodynamic heating

DEF The heating of a body produced by the passage of air or other gases over its surface.

- GS heating
- . kinetic heating
- . . **aerodynamic heating**
- . . . shock heating
- RT ablation
- aerodynamics
- aerothermochemistry
- aerothermodynamics
- atmospheric entry
- boundary layer plasmas
- compressible fluids
- convective heat transfer
- hypersonic reentry
- reentry
- reentry effects
- reentry shielding
- skin friction
- skin temperature (non-biological)
- temperature sensitive paints
- transient heating
- uncontrolled reentry (spacecraft)

### aerodynamic interference

- GS aerodynamic forces
- . **aerodynamic interference**
- RT aerodynamics
- air flow
- aircraft configurations
- aircraft structures
- airfoil profiles
- control surfaces
- ∞ interference
- protuberances
- rotor stator interactions
- turbulent flow
- wing profiles

### aerodynamic lift

USE **lift**

### aerodynamic loads

- GS aerodynamic forces
- . **aerodynamic loads**
- . . blast loads
- . . gust loads
- loads (forces)
- . dynamic loads
- . . **aerodynamic loads**
- . . . blast loads
- . . . gust loads
- RT axial compression loads
- axial loads
- compression loads
- critical loading

- edge loading
- force distribution
- loading moments
- pressure distribution
- shock loads
- static loads
- structural design criteria
- thrust loads
- transient loads
- vibratory loads
- wing loading

### aerodynamic moments

USE **stability derivatives**

### aerodynamic noise

- UF *boundary layer noise*
- GS elastic waves
- . sound waves
- . . noise (sound)
- . . . flow noise
- . . . . **aerodynamic noise**
- . . . . . blade slap noise
- . . . . . propeller noise
- . . . . . screech tones
- RT acoustic retrofitting
- aerodynamic characteristics
- aeroelasticity
- aircraft noise
- computational aeroacoustics
- Ffowcs Williams-Hawkings equation
- flutter
- jet aircraft noise
- noise measurement
- noise reduction
- panel flutter
- shock waves
- sonic booms
- surface noise interactions

### aerodynamic stability

- UF *flying platform stability*
- GS aerodynamic characteristics
- . **aerodynamic stability**
- dynamic characteristics
- . dynamic stability
- . . motion stability
- . . . **aerodynamic stability**
- stability
- . dynamic stability
- . . motion stability
- . . . **aerodynamic stability**
- RT aeroelasticity
- aircraft stability
- airfoil oscillations
- attitude stability
- ballast (mass)
- boundary layer stability
- buffeting
- directional stability
- dynamic tests
- flight envelopes
- flight stability tests
- flow stability
- flutter
- ground resonance
- helicopter performance
- hovering
- lateral stability
- liquid sloshing
- longitudinal stability
- low speed stability
- mass distribution
- pilot induced oscillation
- pressure distribution
- reentry
- Richardson number
- spacecraft motion
- spacecraft stability
- stability augmentation
- static aerodynamic characteristics
- turbulence effects
- unsteady aerodynamics
- vortex avoidance
- wind tunnel stability tests
- wing oscillations
- wing rock

yaw

**aerodynamic stalling**

- RT aircraft performance
- aircraft spin
- airspeed
- angle of attack
- boundary layer separation
- lift drag ratio
- low speed stability
- rotating stalls
- ∞ stalling
- sweep angle
- zero lift

**aerodynamic vehicles**USE **aircraft****aerodynamics**

DEF The science that deals with the motion of air and other gaseous fluids, and the forces acting on bodies when the bodies move through such fluids, or when such fluids move against or around the bodies. Used for hydroaeromechanics.

- UF *hydroaeromechanics*
- GS mechanics (physics)

- . fluid mechanics
- . fluid dynamics
- . . . gas dynamics
- . . . . **aerodynamics**
- . . . . . aerothermodynamics
- . . . . . hypersonics
- . . . . . rotor aerodynamics
- . . . . . supersonics
- . . . . . unsteady aerodynamics

- RT aeroacoustics
- aerodynamic heating
- aerodynamic interference
- aeroelasticity
- aeronautical engineering
- ∞ aeronautics
- ∞ aerospace sciences
- ∞ aircraft
- airfoils
- blunt bodies
- bodies of revolution
- boundary layer control
- compressible flow
- control surfaces
- drag
- ∞ dynamics
- ∞ flight
- flight characteristics
- flight mechanics
- ∞ flow
- flow theory
- free wing aircraft
- ground effect (aerodynamics)
- hypersonic flight
- hypersonic flow
- incompressible flow
- inviscid flow
- laminar flow
- lift
- Mach number
- Mach-Zehnder interferometers
- reentry
- ∞ science
- slender bodies
- subsonic flow
- supersonic flow
- thermodynamics
- transonic flow
- turbulent flow
- uniform flow
- unsteady flow
- viscous flow
- wind measurement
- wind tunnels

**aeroelastic research wings**

DEF Wings that are designed with less than normal stiffness to test devices that suppress flutter.

- GS airfoils
- . wings
- . . **aeroelastic research wings**
- RT aircraft design
- flutter

- flutter analysis
- structural design
- wing oscillations

**aeroelasticity**

DEF The study of the response of structurally elastic bodies to aerodynamic loads.

- GS mechanical properties
- . elastic properties
- . . **aeroelasticity**
- . . . aeroservoelasticity
- . . . aerothermoelasticity
- RT aerodynamic noise
- aerodynamic stability
- aerodynamics
- aerothermodynamics
- aircraft structures
- airfoil oscillations
- DAST program
- flutter
- influence coefficient
- panel flutter
- rigid wings
- thermoelasticity
- unsteady aerodynamics
- wing loading

**aeroembolism**

DEF The formation or liberation of gases in the blood vessels of the body, as brought on by a too-rapid change from a high, or relatively high, atmospheric pressure to a lower one.

- GS embolisms
- . **aeroembolism**
- RT altitude sickness
- decompression sickness
- fat embolisms
- stress (physiology)

**aerogels**

(added June 1990)

- RT foams
- gels
- porous materials
- silica gel
- xerogels

**aerogyro helicopters**USE **XH-51 helicopter****aerology**

DEF The study of the free atmosphere throughout its vertical extent, as distinguished from studies confined to the layer of the atmosphere adjacent to the Earth's surface.

- GS meteorology
- . **aerology**
- RT Atmospheric & Oceanographic Inform Sys
- Global Atmospheric Research Program
- meteorological parameters
- polar meteorology
- sea breeze
- wind (meteorology)

**aeromagnetism**

- RT aerial reconnaissance
- geomagnetism
- magnetic anomalies
- magnetic surveys
- magnetic variations
- remote sensing

**aeromagneto flutter**USE **flutter****aeromaneuvering**

DEF Changing orbit size or plane or both by entering the upper atmosphere to create drag or lift or both.

- RT aeroassist
- aerobraking
- aerocapture
- aeroshells
- atmospheric entry
- interplanetary transfer orbits

transfer orbits

**Aeromaneuvering Orbit to Orbit Shuttle**

DEF Proposed reusable upper stage for the Space Shuttle superseded by the orbit transfer vehicle. Used for AMOOS.

- UF *AMOOS*
- GS orbit transfer vehicles
- . **Aeromaneuvering Orbit to Orbit Shuttle**
- RT Orbit Maneuvering Engine (Space Shuttle)
- orbital mechanics
- reusable launch vehicles
- space shuttles

**aeronautical engineering**

- GS aerospace engineering
- . **aeronautical engineering**
- RT aerodynamics
- ∞ aeronautics
- ∞ aircraft
- aircraft design
- aircraft industry
- auxiliary propulsion
- compound helicopters
- ∞ engineering
- functional design specifications
- mechanical engineering
- propulsion
- structural engineering

**aeronautical satellites**

- GS artificial satellites
- . communication satellites
- . . **aeronautical satellites**
- . . . Aerosat satellites
- RT ∞ aeronautics
- air traffic control
- aircraft approach spacing
- aircraft communication
- ground-air-ground communication
- rescue operations
- satellite networks

**∞ aeronautics**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *aviation*
- RT aeroacoustics
- aerodynamics
- aeronautical engineering
- aeronautical satellites
- aerospace engineering
- ∞ aerospace sciences
- air law
- ∞ aircraft
- airports
- avionics
- civil aviation
- ∞ flight
- general aviation aircraft
- human factors engineering
- ∞ military aviation
- ∞ science
- TACT program

**aeronomy**

DEF The study of the upper regions of the atmosphere where ionization, dissociation, and chemical reactions take place.

- RT airglow
- Alpine meteorology
- atmospheric composition
- atmospheric physics
- auroras
- DIAL satellite
- field aligned currents
- flux transfer events
- geophysics
- magnetosphere-ionosphere coupling
- mesometeorology
- meteorology
- Nozomi Mars Orbiter
- polar cusps

## aeroquatic vehicles

upper atmosphere

### aerophysics

USE **atmospheric physics**

### aeroquatic vehicles

RT aircraft design  
attack aircraft  
∞ military vehicles  
underwater propulsion  
underwater vehicles

### AEROS satellite

GS artificial satellites  
. meteorological satellites  
. . **AEROS satellite**  
. synchronous satellites  
. . **AEROS satellite**

### Aerosat satellites

GS artificial satellites  
. communication satellites  
. . aeronautical satellites  
. . . **Aerosat satellites**  
. ESA satellites  
. . **Aerosat satellites**  
. navigation satellites  
. . **Aerosat satellites**  
. synchronous satellites  
. . **Aerosat satellites**  
ESA spacecraft  
. ESA satellites  
. . **Aerosat satellites**  
RT European space programs  
satellite networks

### aeroservoelasticity

(added September 1993)

UF **ASE (aerodynamics)**

GS mechanical properties  
. elastic properties  
. . aeroelasticity  
. . . **aeroservoelasticity**

RT active control  
actuators  
airfoil oscillations  
dynamic control  
dynamic response  
dynamic structural analysis  
flutter  
servocontrol  
unsteady aerodynamics

### aeroshells

(added May 1999)

DEF Aerodynamic structural shells that attach to, or comprise a portion of, the exterior of an aerospace vehicle or space probe; especially such structures that support atmospheric entry, aerobraking, aeroassist, or hypersonic flight.

GS aerodynamic configurations  
. **aeroshells**

RT aeromaneuvering  
nose cones  
reentry vehicles  
spacecraft design  
spacecraft shielding  
spacecraft structures

### aerosinusitis

GS diseases  
. respiratory diseases  
. . **aerosinusitis**

RT aerospace medicine  
altitude sickness

### aerosols

DEF Dispersions of solid or liquid particles in gaseous media.

GS mixtures  
. dispersions  
. . colloids  
. . . **aerosols**  
. . . . fog  
. liquid-gas mixtures  
. . . **aerosols**  
. . . . fog  
particles  
. **aerosols**  
. . fog

RT air pollution  
Aitken nuclei  
atmospheric effects  
atomizing  
CALIPSO (Pathfinder satellite)  
CloudSat  
condensation nuclei  
crop dusting  
dust  
entrainment  
environment pollution  
environmental surveys  
exhaust clouds  
fog dispersal  
fumes  
gas atomization  
Glory Mission satellite  
MISR (radiometry)  
mist  
mixers  
particulates  
photophoresis  
pollution transport  
radiative forcing  
SAGE satellite  
smoke  
smoke abatement  
spraying  
thermophoresis

### aerospace engineering

UF *space systems engineering*

GS **aerospace engineering**  
. aeronautical engineering

RT ∞ aeronautics  
∞ aerospace sciences  
∞ aircraft  
∞ engineering  
mechanical engineering  
missile design  
structural engineering

### aerospace environments

SN (EXCLUDES SPACECRAFT  
INTRAVEHICULAR ENVIRONMENTS)

UF *space environment*

GS environments  
. **aerospace environments**  
. . cislunar space  
. . deep space  
. . . interplanetary space  
. . . interstellar space  
. . Earth orbital environments

RT ∞ aerospace sciences  
argon-oxygen atmospheres  
∞ astronautics  
bioastronautics  
bioprocessing  
biosatellites  
cosmic rays  
Earth atmosphere  
electromagnetic radiation  
exobiology  
extraterrestrial environments  
extraterrestrial life  
extraterrestrial radiation  
extravehicular activity  
geophysical fluid flow cells  
hazardous material disposal (in space)  
helium-oxygen atmospheres  
Jupiter atmosphere  
life support systems  
lunar environment  
manned space flight  
Mars atmosphere  
Neptune atmosphere  
panspermia  
planetary environments  
radiation belts  
solar radiation  
space exploration  
space flight  
space habitats  
space manufacturing  
space weather  
space weathering  
spaceborne experiments  
spacecraft cabin simulators  
thermal environments

Uranus atmosphere  
vacuum  
Venus atmosphere

### aerospace industry

GS industries  
. **aerospace industry**  
. . aircraft industry  
RT ∞ aircraft  
commercial spacecraft  
space commercialization

### aerospace medicine

DEF That branch of medicine dealing with the effects of flight through the atmosphere or in space upon the human body and with the prevention or cure of physiological or psychological malfunctions arising from these effects.

UF *space medicine*

GS medical science  
. **aerospace medicine**

. . aviation psychology  
. . space psychology  
RT acceleration stresses (physiology)  
aerosinusitis  
∞ aerospace sciences  
altitude sickness  
bioastronautics  
biofeedback  
∞ biology  
biomedical data  
Chlorella  
closed ecological systems  
electrolyte metabolism  
fasting  
flight fatigue  
fluid shifts (biology)  
gravitational physiology  
gravity perception  
head down tilt  
head movement  
head up tilt  
hindlimb suspension  
immunosuppression  
∞ medicine  
mobile quarantine facility  
motion sickness  
radiology  
∞ science  
space adaptation syndrome  
spacecraft environments  
sports medicine  
telemedicine  
tilt-table test  
weightlessness

### aerospace planes

GS aerospace vehicles  
. **aerospace planes**  
. . HOPE aerospace plane  
. . HOTOL launch vehicle  
. . VentureStar launch vehicle  
. . X-30 vehicle  
. . X-37 vehicle  
. . X-40A vehicle  
maneuverable spacecraft  
. **aerospace planes**  
. . HOPE aerospace plane  
. . HOTOL launch vehicle  
. . VentureStar launch vehicle  
. . X-30 vehicle  
. . X-37 vehicle  
. . X-40A vehicle  
reentry vehicles  
. recoverable spacecraft  
. reusable spacecraft  
. . **aerospace planes**  
. . . HOPE aerospace plane  
. . . . HOTOL launch vehicle  
. . . . VentureStar launch vehicle  
. . . . X-30 vehicle  
. . . . X-37 vehicle  
. . . . X-40A vehicle  
soft landing spacecraft  
. **aerospace planes**  
. . HOPE aerospace plane  
. . HOTOL launch vehicle  
. . VentureStar launch vehicle  
. . X-30 vehicle  
. . X-37 vehicle

. . X-40A vehicle  
 RT ∞ aircraft  
 Astro vehicle  
 boostglide vehicles  
 Buran space shuttle  
 Delta Clipper  
 gliders  
 hypersonic aircraft  
 hypersonic gliders  
 launch vehicles  
 lifting reentry vehicles  
 liquid air cycle engines  
 military spacecraft  
 National Aerospace Plane Program  
 research aircraft  
 rocket planes  
 Saenger space transportation system  
 transatmospheric vehicles  
 X-20 aircraft

#### aerospace safety

DEF The engineering assessment and analysis of systems, subsystems, and functions of spacecraft, missiles, advanced aircraft and ground support in order to identify hazards associated with such systems and to design procedures that eliminate those hazards or determine tolerable safety levels.

GS safety  
 . aerospace safety  
 RT accident prevention  
 aircraft safety  
 flight safety  
 range safety  
 runway incursions  
 safety factors  
 safety management  
 space weather

#### ∞ aerospace sciences

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 UF space sciences  
 RT aerodynamics  
 ∞ aeronautics  
 aerospace engineering  
 aerospace environments  
 aerospace medicine  
 aerospace systems  
 astronomy  
 Committee on Space Research  
 environmental engineering  
 extraterrestrial radiation  
 International Space Year  
 space laboratories

#### aerospace systems

RT ∞ aerospace sciences  
 control systems design  
 missile systems  
 ∞ systems  
 systems engineering

#### aerospace technology transfer

DEF Technology transfer germane to aircraft and space vehicles, their propulsion, guidance, etc.

GS technology transfer  
 . aerospace technology transfer  
 RT Canadian space program  
 information flow  
 reports  
 technological forecasting  
 technology utilization

#### aerospace vehicles

DEF Vehicles capable of flight within and outside the sensible atmosphere.

GS aerospace vehicles  
 . aerospace planes  
 . . HOPE aerospace plane  
 . . HOTOL launch vehicle  
 . . VentureStar launch vehicle  
 . . X-30 vehicle  
 . . X-37 vehicle  
 . . X-40A vehicle  
 . flexible spacecraft  
 . X-43 vehicle  
 RT ∞ aircraft

commercial spacecraft  
 ∞ spacecraft  
 transatmospheric vehicles

#### aerospike engines

(added July 1997)

DEF Rocket engines incorporating a radial in-flow (aerospike) nozzle for altitude compensation. Since the nozzle is open to the ambient atmosphere, the plume compensates for decreasing atmospheric pressure as the vehicle ascends.

GS engines  
 . rocket engines  
 . . aerospace engines  
 RT nozzle design  
 plug nozzles  
 propulsion system configurations  
 rocket engine design  
 rocket exhaust  
 rocket nozzles  
 spike nozzles  
 VentureStar launch vehicle

#### aerostatics

GS statics  
 . aerostatics  
 RT buoyancy  
 ∞ dynamics  
 ∞ equilibrium  
 fluid mechanics  
 hydrostatics

#### aerostats

USE airships

#### aerothermochemistry

GS environmental chemistry  
 . aerothermochemistry  
 thermochemistry  
 . aerothermochemistry  
 RT ablation  
 aerodynamic heating  
 aerothermodynamics  
 atmospheric chemistry  
 chemical engineering  
 ∞ chemistry  
 nozzle flow  
 physical chemistry  
 pyrometallurgy  
 reentry physics  
 reentry shielding  
 reentry vehicles

#### aerothermodynamics

DEF The study of aerodynamic phenomena at sufficiently high gas velocities that thermodynamic properties of the gas are important.

GS mechanics (physics)  
 . fluid mechanics  
 . . fluid dynamics  
 . . . gas dynamics  
 . . . . aerodynamics  
 . . . . . aerothermodynamics  
 thermodynamics  
 . aerothermodynamics  
 RT aerodynamic heat transfer  
 aerodynamic heating  
 aeroelasticity  
 aerothermochemistry  
 ASSET project  
 boundary layer plasmas  
 ∞ chemistry  
 combustion physics  
 ∞ dynamics  
 hypersonic heat transfer  
 hypersonic reentry  
 hypersonics  
 Rankine-Hugoniot relation  
 reentry  
 reentry physics  
 ∞ science  
 skin temperature (non-biological)  
 supersonics  
 thermoelasticity

#### aerothermoelasticity

DEF The study of the response of elastic structures to the combined effects of aerodynamic heating and loading.

GS mechanical properties  
 . elastic properties  
 . . aeroelasticity  
 . . . aerothermoelasticity  
 . . thermoelasticity  
 . . . aerothermoelasticity

#### aerozine

DEF A rocket fuel consisting of a mixture of hydrazine and unsymmetrical dimethylhydrazine (UDMH).

GS propellants  
 . rocket propellants  
 . . liquid rocket propellants  
 . . . aeroxine  
 RT dimethylhydrazines  
 hydrazines

#### AFC (control)

USE automatic frequency control

#### AFCs (control system)

USE automatic flight control

#### affects

USE effects

#### afferent nervous systems

GS anatomy  
 . nervous system  
 . . afferent nervous systems  
 RT sensorimotor performance  
 ∞ systems

#### affinity

GS affinity  
 . electron affinity  
 . negative electron affinity  
 RT attraction  
 chemical compatibility  
 compatibility

#### Afghanistan

GS nations  
 . Afghanistan  
 RT Asia

#### AFM (microscopy)

USE atomic force microscopy

#### Africa

GS continents  
 . Africa  
 RT African rift system  
 Algeria  
 Angola  
 Arcomsat  
 Benin  
 Botswana  
 Burkina  
 Burundi  
 Cameroon  
 Cape Verde  
 Central African Republic  
 Chad  
 Congo (Brazzaville)  
 Cote d'Ivoire  
 Democratic Republic of Congo  
 Djibouti  
 Egypt  
 Ethiopia  
 Gabon  
 Gambia  
 Ghana  
 Guinea  
 Kalahari Basin (Africa)  
 Kenya  
 Lesotho  
 Liberia  
 Libya  
 Libyan desert  
 Madagascar  
 Malawi  
 Mali  
 Mauritania  
 Mauritius  
 Middle East  
 Morocco  
 Mozambique  
 Namibia

## African rift system

nations  
 Niger  
 Nigeria  
 Red Sea  
 Republic of South Africa  
 Rwanda  
 Sahara Desert (Africa)  
 Senegal  
 Seychelles  
 Sierra Leone  
 Somalia  
 Spanish Sahara  
 Sudan  
 Swaziland  
 Tanzania  
 Togo  
 Tunisia  
 Uganda  
 Zambia  
 Zimbabwe

### African rift system

GS geological faults  
 . **African rift system**  
 RT Africa  
 ∞ systems

### afterbodies

DEF Companion bodies that trail satellites. Sections or pieces of rockets or spacecraft that enter the atmosphere unprotected behind nose cones or other bodies that are protected for entry. Afterparts of vehicles. Used for cylindrical afterbodies and sterns.

UF *cylindrical afterbodies*  
*sterns*  
 RT aircraft structures  
 base heating  
 boattails  
 ∞ bodies  
 centerbodies  
 conical bodies  
 cylindrical bodies  
 flared bodies  
 forebodies  
 skirts  
 swing tail assemblies  
 tail assemblies

### afterburners

USE **afterburning**

### afterburning

DEF Irregular burning of fuel left in the firing chamber of a rocket after cutoff. The function of an afterburner, a device for augmenting the thrust of a jet engine by burning additional fuel in the uncombined oxygen in the gases from the turbine. Used for afterburners.

UF *afterburners*  
 GS combustion  
 . **afterburning**  
 RT burners  
 exhaust systems  
 infrared suppression  
 internal combustion engines  
 J-57 engine  
 jet engines  
 thrust augmentation

### afterglows

DEF Broad, high arches of radiance or glow seen occasionally in the western sky above the highest clouds in deepening twilight, caused by the scattering effect of very fine particles of dust suspended in the upper atmosphere. Also, the transient decay of a plasma after the power has been turned off.

GS **afterglows**  
 . helium afterglow  
 . oxygen afterglow  
 RT atmospheric ionization  
 gas discharges  
 gas ionization  
 light scattering  
 luminescence  
 phosphorescence  
 plasma decay

Swift observatory

### afterimages

GS images  
 . **afterimages**  
 RT critical flicker fusion  
 illusions  
 psychological effects  
 sensory perception  
 visual perception

### AGB stars

USE **asymptotic giant branch stars**

### AGC (control)

USE **automatic gain control**

### age determination

USE **chronology**

### age factor

RT aging (biology)  
 gerontology  
 life span

### age hardening

USE **precipitation hardening**

### Agena A rocket vehicle

GS rocket vehicles  
 . single stage rocket vehicles  
 . . Agena rocket vehicles  
 . . . **Agena A rocket vehicle**  
 RT Discoverer satellites  
 Thor Agena launch vehicle

### Agena B Ranger Program

GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . Ranger project  
 . . . . **Agena B Ranger Program**  
 . projects  
 . . Ranger project  
 . . . **Agena B Ranger Program**  
 . space programs  
 . . NASA space programs  
 . . . Ranger project  
 . . . . **Agena B Ranger Program**  
 RT Thor Agena launch vehicle

### Agena B rocket vehicle

GS rocket vehicles  
 . single stage rocket vehicles  
 . . Agena rocket vehicles  
 . . . **Agena B rocket vehicle**  
 RT Discoverer satellites  
 Echo satellites  
 EGO  
 Gemini project  
 Mariner program  
 OAO  
 POGO  
 Ranger project

### Agena C rocket vehicle

GS rocket vehicles  
 . single stage rocket vehicles  
 . . Agena rocket vehicles  
 . . . **Agena C rocket vehicle**

### Agena D rocket vehicle

GS rocket vehicles  
 . single stage rocket vehicles  
 . . Agena rocket vehicles  
 . . . **Agena D rocket vehicle**

### Agena rocket vehicles

GS rocket vehicles  
 . single stage rocket vehicles  
 . . **Agena rocket vehicles**  
 . . . Agena A rocket vehicle  
 . . . Agena B rocket vehicle  
 . . . Agena C rocket vehicle  
 . . . Agena D rocket vehicle  
 RT Atlas Agena B launch vehicle  
 Atlas Agena launch vehicles  
 Discoverer satellites  
 Echo satellites  
 Gemini project  
 Mariner program

Ranger project  
 Thor Agena launch vehicle

### ∞ agents

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT accelerating agents  
 additives  
 anticoagulants  
 antifouling  
 antioxidants  
 diluents  
 neutralizers  
 opacifiers  
 oxidizers  
 penetrants  
 preservatives  
 stabilizers (agents)  
 surfactants

### agglomeration

RT accumulations  
 atomic clusters  
 cementation  
 clumps  
 coagulation  
 coalescing  
 compacting  
 crystallization  
 densification  
 flocculating  
 galactic clusters  
 lumping  
 metal clusters  
 micelles  
 molecular clusters  
 plugging  
 precipitation (chemistry)  
 ∞ separation  
 settling  
 sintering  
 Virgo galactic cluster

### agglutination

GS bonding  
 . **agglutination**  
 RT adhesion  
 adhesive bonding  
 adhesives  
 cementation  
 chemical bonds  
 cohesion

### aggregates

RT concrete structures  
 concretes  
 ∞ construction materials  
 dolomite (mineral)  
 gravels  
 lava  
 limestone  
 micelles  
 rocks  
 sands  
 slags

### ∞ aging

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT aging (biology)  
 aging (materials)  
 aging (metallurgy)  
 radioactive age determination

### aging (biology)

RT age factor  
 ∞ aging  
 ∞ biology  
 geriatrics  
 gerontology  
 life sciences  
 life span  
 mortality  
 physiology

### aging (materials)

GS **aging (materials)**  
 . aging (metallurgy)

- RT ∞ aging  
hardening (materials)  
∞ materials  
mechanical properties  
microstructure  
strain hardening
- aging (metallurgy)**  
GS aging (materials)  
. **aging (metallurgy)**  
RT ∞ aging  
hardening (materials)  
heat treatment  
microstructure  
solid solutions  
strain hardening  
supercooling  
time temperature parameter
- agitation**  
GS **agitation**  
. ultrasonic agitation  
RT aeration  
blowing  
chemical reaction control  
coalescing  
colloiding  
dispersing  
disposal  
homogenizing  
mixers  
mixing  
∞ separation  
settling  
shaking  
sizing screens  
splashing  
suspending (mixing)  
swirling  
turbulent mixing  
vortices  
water treatment
- agreements**  
RT contracts  
conventions  
insurance (contracts)  
subcontracts
- agricultural aircraft**  
DEF Light aircraft specially equipped for agricultural applications such as crop dusting.  
UF *Snow aerial applicator aircraft S-2B*  
*Snow S-2 aircraft*  
GS general aviation aircraft  
. **agricultural aircraft**  
RT agriculture  
∞ aircraft  
AN-2 aircraft  
crop dusting  
light aircraft  
swath width
- agriculture**  
GS **agriculture**  
. aquiculture  
. silviculture  
RT agricultural aircraft  
AgRISTARS project  
agroclimatology  
agrometeorology  
agrophysical units  
alfalfa  
barley  
∞ biology  
botany  
citrus trees  
conservation  
corn  
crop dusting  
crop growth  
crop identification  
crop inventories  
crop vigor  
∞ crops  
farm crops  
farmlands  
fruits  
genetically modified plants  
grasslands
- Great Plains Corridor (North America)  
halophiles  
hay  
hydrocarbon fuel production  
hydroponics  
irrigation  
Large Area Crop Inventory  
Experiment  
leguminous plants  
oats  
orchards  
plant diseases  
plant stress  
planting  
plants (botany)  
plowing  
plows  
rural areas  
rural land use  
soil science  
sorghum  
sugar beets  
sugar cane  
sunflowers  
tomatoes  
tractors  
vegetation growth  
vineyards
- AgRISTARS project**  
DEF A multiagency program utilizing Landsat remote sensing data to predict crop yields, land use, and detect pollution. Used for Crop Inventories by Remote Sensing.  
UF *Crop Inventories by Remote Sensing*  
GS programs  
. projects  
. . . **AgRISTARS project**  
RT agriculture  
agrophysical units  
crop inventories  
farm crops  
fresh water  
land use  
Landsat satellites  
meteorological satellites  
NASA programs  
remote sensors  
vegetative index
- agroclimatology**  
GS climatology  
. **agroclimatology**  
RT agriculture  
agrometeorology  
hydroclimatology  
meteorological parameters  
meteorology  
microclimatology
- agrometeorology**  
GS meteorology  
. **agrometeorology**  
RT agriculture  
agroclimatology  
hydrometeorology  
micrometeorology  
thermal resources  
tropical meteorology
- agrophysical units**  
DEF Geographic areas defined for statistical purposes by AgRISTARS personnel whose boundaries are based on natural rather than political lines for the purpose of comparing similar agricultural regions.  
RT agriculture  
AgRISTARS project  
farmlands  
Large Area Crop Inventory  
Experiment
- AGT  
USE **automated guideway transit vehicles**
- AH-1G helicopter**  
DEF US Army designation for the Bell Model 209 Hueycobra attack helicopter powered by a single Avco Lycoming T53-L-13 turboshaft engine.  
GS attack aircraft  
. **AH-1G helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . . helicopters  
. . . . military helicopters  
. . . . **AH-1G helicopter**  
RT ∞ military aircraft
- AH-1S helicopter**  
(added April 1997)  
GS attack aircraft  
. **AH-1S helicopter**  
Bell aircraft  
. **AH-1S helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . . helicopters  
. . . . military helicopters  
. . . . **AH-1S helicopter**  
RT ∞ aircraft  
∞ military aircraft
- AH-1W helicopter**  
(added April 1997)  
UF *SuperCobra*  
GS attack aircraft  
. **AH-1W helicopter**  
Bell aircraft  
. **AH-1W helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . . helicopters  
. . . . military helicopters  
. . . . **AH-1W helicopter**  
RT ∞ aircraft  
∞ military aircraft
- AH-63 helicopter**  
GS attack aircraft  
. **AH-63 helicopter**  
Bell aircraft  
. **AH-63 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . . helicopters  
. . . . military helicopters  
. . . . **AH-63 helicopter**  
RT ∞ military aircraft
- AH-64 helicopter**  
GS attack aircraft  
. **AH-64 helicopter**  
Hughes aircraft  
. **AH-64 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . . helicopters  
. . . . military helicopters  
. . . . **AH-64 helicopter**  
RT ∞ military aircraft
- ∞ **aids**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT landing aids  
navigation aids  
visual aids
- AIDS (disease)*  
USE **acquired immunodeficiency syndrome**
- aileron**  
GS airfoils  
. **aileron**  
. . . flaperons  
. . . spoiler slot ailerons  
control surfaces  
. **aileron**  
. . . flaperons  
. . . spoiler slot ailerons  
RT elevators (control surfaces)  
elevons  
lateral control



# air

tabs (control surfaces)

*AIMP-1*  
USE **Explorer 33 satellite**

*AIMP-2*  
USE **Explorer 35 satellite**

*AIMP-D*  
USE **Explorer 33 satellite**

*AIMP-E*  
USE **Explorer 35 satellite**

**air**  
DEF The mixture of gases comprising the Earth's atmosphere.  
GS gases  
. gas mixtures  
. . **air**  
. . . alveolar air  
. . . compressed air  
. . . expired air  
. . . high temperature air  
. . . liquid air  
mixtures  
. solutions  
. . gas mixtures  
. . . **air**  
. . . . alveolar air  
. . . . compressed air  
. . . . expired air  
. . . . high temperature air  
. . . . liquid air  
RT air data systems  
∞ atmospheres  
atmospheric composition  
Earth atmosphere  
environments  
middle atmosphere

**air bag restraint devices**  
GS bags  
. **air bag restraint devices**  
expandable structures  
. inflatable structures  
. . **air bag restraint devices**  
safety devices  
. **air bag restraint devices**  
RT accident prevention  
accidents  
automobiles  
collisions  
crashes  
∞ devices  
highways  
pneumatic equipment  
safety

*air bearings*  
USE **gas bearings**

*air blasts*  
USE **aerial explosions**

**air breathing boosters**  
DEF Boosters which are possible substitutes for rocket engines and which have inlets for oxygen sources for their engines rather than carrying their own oxygen as in a conventional rocket.  
RT air breathing engines  
booster rocket engines  
∞ boosters  
rocket-based combined-cycle engines

**air breathing engines**  
GS engines  
. **air breathing engines**  
. . gas turbine engines  
. . . hydrogen engines  
. . . jet engines  
. . . T-58 engine  
. . . ramjet engines  
. . . . integral rocket ramjets  
. . . . low volume ramjet engines  
. . . . pulsejet engines  
. . . . supersonic combustion ramjet engines  
. . . . turboramjet engines

. . . . turbojet engines  
. . . . . Bristol-Siddeley Olympus 593 engine  
. . . . . Bristol-Siddeley Viper engine  
. . . . ducted fan engines  
. . . . . J-33 engine  
. . . . . J-34 engine  
. . . . . J-47 engine  
. . . . . J-52 engine  
. . . . . J-57 engine  
. . . . . J-58 engine  
. . . . . J-65 engine  
. . . . . J-69-T-25 engine  
. . . . . J-71 engine  
. . . . . J-73 engine  
. . . . . J-75 engine  
. . . . . J-79 engine  
. . . . . J-85 engine  
. . . . . J-93 engine  
. . . . . RA-28 engine  
. . . . . turbofan engines  
. . . . . Bristol-Siddeley BS 53 engine  
. . . . . CF-700 engine  
. . . . . convertible fan-shaft engines  
. . . . . J-97 engine  
. . . . . TF-30 engine  
. . . . . TF-34 engine  
. . . . . TF-41 engine  
. . . . . turboprop engines  
. . . . . T-34 engine  
. . . . . T-38 engine  
. . . . . T-53 engine  
. . . . . T-55 engine  
. . . . . T-56 engine  
. . . . . T-63 engine  
. . . . . T-64 engine  
. . . . . T-74 engine  
. . . . . T-76 engine  
. . . . . T-78 engine  
. . . . . turboramjet engines  
RT air breathing boosters  
pulse detonation engines  
rocket-based combined-cycle engines

**air cargo**  
UF *air freight*  
GS cargo  
. **air cargo**  
. . air mail  
RT airdrops  
airfield surface movements  
airline operations  
baggage  
cargo aircraft  
ground handling  
heavy lift helicopters

**air conditioning**  
DEF The simultaneous control of all, or at least three, of those factors affecting both the physical and chemical conditions of the atmosphere within any structure. These factors include temperature, humidity, motion, distribution, dust, bacteria, odor, and toxic gases.  
RT blowers  
comfort  
condensers (liquefiers)  
controlled atmospheres  
coolants  
coolers  
cooling  
cooling systems  
∞ diffusers  
exhaust systems  
freon  
heat pumps  
heating  
heating equipment  
humidity  
infiltration  
life support systems  
Modular Integrated Utility System  
refrigerants  
refrigerating  
refrigerating machinery  
space heating (buildings)  
temperature  
temperature control  
temperature distribution

thermal insulation  
∞ treatment  
ventilation

**air conditioning equipment**  
RT absorbents  
absorbers (equipment)  
adsorbents  
blowers  
compressors  
condensers (liquefiers)  
coolers  
cooling systems  
∞ diffusers  
∞ equipment  
evaporators  
∞ fans  
heat pumps  
heating equipment  
oxygen supply equipment  
refrigerating machinery

**air conductivity**  
RT atmospheric conductivity  
electrical resistivity  
thermal conductivity

**air cooling**  
SN (COOLING WITH AIR)  
GS cooling  
. **air cooling**  
RT coolants  
coolers  
cooling systems  
liquid cooling  
refrigerating  
ventilation

**air currents**  
GS fluid flow  
. gas flow  
. . air flow  
. . . **air currents**  
. . . . jet streams (meteorology)  
. . . . meridional flow  
. . . . vertical air currents  
RT atmospheric circulation  
barotropic flow  
boundary layer flow  
boundary layer transition  
Brunt-Vaisala frequency  
convection clouds  
convection currents  
∞ currents  
ground wind  
lee waves  
sea breeze  
upstream  
wind (meteorology)  
windpower utilization  
zonal flow (meteorology)

**air cushion landing systems**  
DEF Landing systems based on the ground effect principle whereby a stratum of air is utilized as the aircraft ground contacting medium (in place of landing gear).  
RT aircraft landing  
cushions  
ground effect (aerodynamics)  
skid landings  
∞ systems

*air cushion vehicles*  
USE **ground effect machines**

**air data systems**  
SN (LIMITED TO FLIGHT DATA SYSTEMS)  
DEF Sets of aerodynamic and thermodynamic sensors, and a computer which provide flight characteristics such as airspeed, static pressure, air temperature and Mach number.  
GS data systems  
. **air data systems**  
RT air  
∞ aircraft  
∞ spacecraft  
tables (data)

wind tunnel tests

### air defense

- GS **air defense**
  - . antimissile defense
  - . SAGE air defense system
- RT antiradiation missiles
  - Ballistic Missile Early Warning System
  - camouflage
  - civil defense
  - deception
- ∞ defense
  - defense program
  - DMSP satellites
  - early warning systems
  - electronic warfare
  - jammers
  - optical countermeasures
  - sabotage
  - space surveillance (ground based)
  - space surveillance (spaceborne)
  - weapons delivery

*Air Density Explorer A*

USE **Explorer 19 satellite**

*Air Density/Injun Explorer B*

USE **Explorer 25 satellite**

### air drop operations

- RT bailout
  - ballutes
  - cargo
  - delivery
  - free fall
- ∞ operations
  - parachutes
  - parawings

### air ducts

- GS ducts
  - . **air ducts**
- RT annular ducts
  - blowers
  - exhaust nozzles
- ∞ fans
  - gas flow
  - ventilators

### air filters

- GS cleaners
  - . **air filters**
  - separators
  - . fluid filters
  - . . **air filters**
- RT cooling systems
  - dust collectors
- ∞ filters
  - precipitators
  - ventilation

### air flow

- GS fluid flow
  - . gas flow
  - . . **air flow**
  - . . . air currents
  - . . . . jet streams (meteorology)
  - . . . . meridional flow
  - . . . . vertical air currents
- RT aerodynamic interference
  - atmospheric boundary layer
  - barotropic flow
  - Brunt-Vaisala frequency
  - compressible flow
- ∞ currents
  - duct geometry
  - ducted flow
  - streamlining
  - streams
  - ventilation

*air freight*

USE **air cargo**

*air inlets*

USE **air intakes**

### air intakes

- UF *air inlets*
- GS intake systems

- . **air intakes**
  - . . engine inlets
  - . . hypersonic inlets
  - . . inlet airframe configurations
  - . . supersonic inlets

- RT bypass ratio
  - conical inlets
  - cowlings
  - inlet nozzles
  - inlet temperature
  - internal compression inlets
  - manifolds
  - nacelles
  - nose inlets
  - plenum chambers
  - scoops
  - side inlets
  - superchargers
  - supersonic diffusers
  - ventilation
  - ventilators
- ∞ water intakes

### air jets

- GS fluid flow
  - . jet flow
  - . . **air jets**
  - fluid jets
  - . **air jets**
- RT gas flow
  - gas jets
  - jet streams (meteorology)
- ∞ jets
  - vapor jets

### air land interactions

- RT atmospheric boundary layer
  - atmospheric circulation
  - Earth cryosphere
  - gas-solid interactions
- ∞ interactions
  - land surface temperature
  - meteorology

### air launching

- GS launching
  - . **air launching**
- RT multistage rocket vehicles
  - Pegasus air-launched booster
  - piggyback systems
  - X-34 reusable launch vehicle

### air law

DEF The body of domestic and/or international laws dealing with regulations and liabilities in civil or military aviation.

- GS law (jurisprudence)
  - . international law
  - . . **air law**
- RT ∞ aeronautics
  - airspace
  - civil aviation
  - conventions
  - insurance (contracts)
  - legal liability
  - liabilities
- ∞ military aviation
  - National Airspace Utilization System
  - penalties
  - politics
  - public law
  - regulations
  - space law

### air locks

DEF A stoppage or diminution of flow in a fuel system, hydraulic system, or the like, caused by pockets of air or vapor. Also chambers capable of being hermetically sealed that provide for passage between two places of different pressure as between an altitude chamber and the outside atmosphere.

- GS compartments
  - . **air locks**
  - . . airlock modules
- RT doors
  - egress
  - enclosures
  - hatches
  - ingress (spacecraft passageway)

- ∞ locks
  - pressure chambers
  - seals (stoppers)

### air mail

- GS cargo
  - . air cargo
  - . . **air mail**

### air masses

DEF Large widespread volumes of air having particular characteristics of temperature and moisture content that were acquired at its source region and are modified as they move away from their source.

- RT anticyclones
  - atmospheric circulation
  - Brunt-Vaisala frequency
  - cold fronts
  - fronts (meteorology)
  - meteorology
  - synoptic meteorology
  - warm fronts
  - weather forecasting
  - windpower utilization

### air navigation

DEF The art, science, or action of plotting and directing the course of an aircraft through the air from one place to another.

- GS navigation
  - . **air navigation**
  - . . all-weather air navigation
  - . . area navigation
  - . . . nap-of-the-earth navigation
  - . . . terrain following
- RT astronavigation
  - boresight error
  - celestial navigation
  - celestial reference systems
  - collision avoidance
- ∞ control
  - dead reckoning
  - digital navigation
  - Doppler navigation
  - flight instruments
  - flight management systems
  - flight paths
  - flight plans
  - flight rules
  - formation flying
  - guidance (motion)
  - hyperbolic navigation
  - inertial navigation
  - instrument flight rules
  - loran
  - loran C
  - loran D
  - National Airspace Utilization System
  - navigation aids
  - Omega Navigation System
  - polar navigation
  - radar navigation
  - radio navigation
  - Shoran
  - solar compasses
  - space navigation
  - Tacan
  - VHF omnirange navigation
  - visual flight

### air piracy

- UF *hijacking*
- GS crime
  - . **air piracy**
- RT aircraft safety
  - airport security
  - flight hazards
  - flight safety
  - operational hazards
  - terrorism

### air pollution

DEF The presence of unwanted material in the air. The term "unwanted material" here refers to material in sufficient concentrations, present for a sufficient time, and under circumstances to interfere significantly with comfort, health, or welfare of persons, or with the full use

## air purification

and enjoyment of property. Used for atmospheric impurities.

UF *atmospheric impurities*  
GS pollution  
. environment pollution  
. . **air pollution**  
. . . global air pollution  
. . . indoor air pollution

RT acid rain  
aerobiology  
aerosols  
ashes  
atmospheric chemistry  
atmospheric composition  
atmospheric density  
atmospheric effects  
biomass burning  
chlorofluorocarbons  
chlorofluoromethane  
clean energy  
climate change  
combustion products  
contamination  
diffusion  
drops (liquids)  
dust  
Earth atmosphere  
Earth environment  
effluents  
environment effects  
environment protection  
environmental chemistry  
environmental quality  
environmental surveys  
environments  
exhaust gases  
exhaust systems  
fallout  
flue gases  
fly ash  
forest fires  
Global Air Sampling Program  
haze  
human wastes  
metabolic wastes  
middle atmosphere  
mixing height  
mutagens  
nitrous acid  
odors  
organic peroxides  
oxidizers  
ozone depletion  
particles  
particulates  
photochemical oxidants  
pollen  
pollution monitoring  
pollution transport  
polynuclear organic compounds  
radiative forcing  
smog  
smoke  
smoke abatement  
soot  
temperature inversions  
volatile organic compounds  
waste disposal  
wastes  
wind (meteorology)

### air purification

GS purification  
. **air purification**  
RT carbon dioxide concentration  
carbon dioxide removal  
decontamination  
electrostatic precipitators  
Hopcalite (trademark)  
rebreathing  
sterilization  
ventilation

### air quality

GS quality  
. environmental quality  
. . **air quality**  
RT Earth atmosphere  
environments

indoor air pollution  
particulates  
pollution control  
pollution monitoring  
volatile organic compounds

### air sampling

GS sampling  
. **air sampling**  
RT electrostatic precipitators  
environment pollution  
gas analysis  
Global Air Sampling Program  
indoor air pollution  
ozonesondes  
particulates  
smog

### air sea ice interactions

GS gas-liquid interactions  
. air water interactions  
. . **air sea ice interactions**  
RT  $\infty$  interactions  
polynyas  
sea ice

### air sea interactions

USE **air water interactions**

### air showers

(added August 1997)  
USE **cosmic ray showers**

### air sickness

USE **motion sickness**

### air slew missiles

DEF Solid propellant rockets utilizing thrust vector control.

GS missiles  
. **air slew missiles**  
RT maneuverability  
 $\infty$  rockets  
solid propellant rocket engines  
thrust vector control

### air start

UF *engine relight (in-flight)*  
*in-flight starting*  
GS starting  
. **air start**  
RT aircraft control  
aircraft engines  
engine control  
flight tests

### air to air missiles

UF *air to air rockets*  
GS missiles  
. **air to air missiles**  
. . Falcon missile  
. . Matra missile  
. . Sidewinder missiles  
. . Sparrow missiles  
. . . Sparrow 2 missile  
. . . Sparrow 3 missile  
RT antiaircraft missiles  
ramjet missiles  
SIAM missiles  
space weapons  
surface to air missiles

### air to air refueling

GS refueling  
. **air to air refueling**  
RT tanker aircraft

### air to air rockets

USE **air to air missiles**

### air to surface missiles

GS missiles  
. **air to surface missiles**  
. . Bullpup missiles  
. . Condor missile  
. . Harpoon missile  
. . Hound Dog missile  
. . Maverick missiles  
. . quail missile  
. . Shrike missile  
RT miss distance

ordnance  
surface to air missiles  
surface to surface missiles  
 $\infty$  surfaces  
weapon systems

### air traffic

GS traffic  
. **air traffic**  
RT aircraft hazards  
airline operations  
airspace  
collision avoidance  
flight hazards  
flight paths  
flight plans  
National Airspace Utilization System  
National Aviation System

### air traffic control

DEF A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

GS ground based control  
. **air traffic control**  
. . automated en route ATC  
. . radar approach control  
traffic control  
. **air traffic control**  
. . automated en route ATC  
. . radar approach control  
RT aeronautical satellites  
airborne radar approach  
aircraft approach spacing  
aircraft communication  
aircraft guidance  
aircraft safety  
airport surface detection equipment  
airport towers  
airports  
airspace  
approach  
approach control  
approach indicators  
attitude control  
automated pilot advisory system  
automated radar terminal system  
Beacon Collision Avoidance System  
collision avoidance  
collisions  
 $\infty$  control  
discrete address beacon system  
flight altitude  
flight control  
flight management systems  
flight paths  
flight plans  
flight rules  
flight safety  
flight time  
ground support equipment  
ground-air-ground communication  
heliports  
instrument flight rules  
instrument landing systems  
landing  
landing aids  
landing instruments  
landing radar  
LOCATES system  
microwave landing systems  
midair collisions  
military air facilities  
National Airspace System  
National Airspace Utilization System  
National Aviation System  
navigation aids  
 $\infty$  operations  
radar navigation  
radio navigation  
routes  
situational awareness  
solar compasses  
surveillance radar  
takeoff  
taxiing  
towers  
tracking (position)  
transponders

vortex advisory system  
vortex avoidance

**air traffic controllers (personnel)**  
GS personnel  
. **air traffic controllers (personnel)**  
RT airport towers  
ground based control  
landing aids  
traffic control

**air transportation**  
DEF The conveyance of cargo and passengers by means of airplanes, helicopters, and other airborne vehicles.  
GS transportation  
. **air transportation**  
RT airline operations  
commercial aircraft  
commuter aircraft  
compound helicopters  
general aviation aircraft  
marine transportation  
National Aviation System  
passenger aircraft  
rapid transit systems  
short haul aircraft  
transport aircraft

**air water interactions**  
UF *air sea interactions*  
GS gas-liquid interactions  
. **air water interactions**  
. . air sea ice interactions  
RT Atmospheric & Oceanographic Inform Sys  
Earth cryosphere  
el Nino  
gyres  
hydrological cycle  
∞ interactions  
liquid-gas mixtures  
liquid-vapor interfaces  
Madden-Julian Oscillation  
ocean dynamics  
ocean models  
sea surface temperature  
water tunnel tests

**airborne equipment**  
GS onboard equipment  
. **airborne equipment**  
. . airborne/spaceborne computers  
. . Light Airborne Multipurpose System  
. . TERCOM  
RT Advanced Range Instrumentation Aircraft  
airborne radar  
aircraft communication  
aircraft equipment  
Astroplane  
automatic landing control  
avionics  
balloon-borne instruments  
cockpit weather information systems  
∞ electric equipment  
∞ equipment  
flight instruments  
hydraulic equipment  
Kuiper Airborne Observatory  
map matching guidance  
MATTS (systems)  
radar equipment  
radio equipment  
SOFIA (airborne observatory)  
vacuum arc switches

**airborne infection**  
GS diseases  
. infectious diseases  
. . **airborne infection**  
RT aerobiology  
parasitic diseases

**Airborne Integrated Reconnaissance System**  
DEF Aerial reconnaissance system incorporating various modes of detection. Used for AIRS (reconnaissance sys).

UF *AIRS (reconnaissance sys)*  
GS reconnaissance  
. aerial reconnaissance  
. . **Airborne Integrated Reconnaissance System**  
RT ground truth  
photoreconnaissance  
∞ systems  
targets

**airborne lasers**  
GS onboard equipment  
. **airborne lasers**  
stimulated emission devices  
. lasers  
. . **airborne lasers**  
RT laser applications  
laser ranger/tracker  
remote sensors  
spaceborne lasers

**airborne radar**  
(added August 1992)  
GS radar  
. **airborne radar**  
. . airborne surveillance radar  
RT airborne equipment  
clutter  
digital radar systems  
Doppler radar  
radar echoes  
radar equipment  
radar imagery  
radar maps  
radar receivers  
radar targets  
remote sensing  
remote sensors  
side-looking radar  
space based radar  
space-time adaptive processing  
synthetic aperture radar

**airborne radar approach**  
DEF The use of airborne radar for helicopter approach control -- the radar cursor technique.  
GS approach  
. **airborne radar approach**  
RT air traffic control  
aircraft approach spacing  
helicopter control  
helicopters  
landing aids  
radar approach control

**airborne range and orbit determination**  
UF *AROD (range-orbit determination)*  
GS orbit determination  
. **airborne range and orbit determination**  
rangefinding  
. **airborne range and orbit determination**  
RT ∞ measurement  
orbits

**airborne surveillance radar**  
GS radar  
. airborne radar  
. . **airborne surveillance radar**  
. surveillance radar  
. . **airborne surveillance radar**  
RT aircraft instruments  
display devices  
onboard equipment

*Airborne Warning and Control System*  
USE **AWACS aircraft**

**airborne/spaceborne computers**  
UF *flight computers*  
*onboard computers*  
*spacecraft computers*  
GS data processing equipment  
. computers  
. . embedded computer systems  
. . . **airborne/spaceborne computers**  
onboard equipment  
. airborne equipment

RT . . **airborne/spaceborne computers**  
data processing  
flight management systems  
highly maneuverable aircraft  
minicomputers  
onboard data processing  
spacecraft components  
spacecraft electronic equipment  
systems integration

*Airbus*  
USE **European Airbus**

∞ **aircraft**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *aerodynamic vehicles*  
RT A-1 aircraft  
A-2 aircraft  
A-3 aircraft  
A-4 aircraft  
A-5 aircraft  
A-6 aircraft  
A-7 aircraft  
A-9 aircraft  
A-10 aircraft  
A-37 aircraft  
A-300 aircraft  
A-330 aircraft  
A-340 aircraft  
Advanced Range Instrumentation Aircraft  
aerodynamics  
aeronautical engineering  
∞ aeronautics  
aerospace engineering  
aerospace industry  
aerospace planes  
aerospace vehicles  
agricultural aircraft  
AH-1S helicopter  
AH-1W helicopter  
air data systems  
aircraft accident investigation  
aircraft accidents  
aircraft antennas  
aircraft approach spacing  
aircraft brakes  
aircraft carriers  
aircraft communication  
aircraft compartments  
aircraft configurations  
aircraft construction materials  
aircraft control  
aircraft design  
aircraft detection  
aircraft engines  
aircraft equipment  
aircraft fuel systems  
aircraft fuels  
aircraft guidance  
aircraft hazards  
aircraft hydraulic systems  
aircraft industry  
aircraft instruments  
aircraft lights  
aircraft maintenance  
aircraft maneuvers  
aircraft noise  
aircraft parts  
aircraft performance  
aircraft pilots  
aircraft production  
aircraft production costs  
aircraft reliability  
aircraft runup  
aircraft safety  
aircraft specifications  
aircraft spin  
aircraft stability  
aircraft structures  
aircraft survivability  
aircraft tires  
aircraft wakes  
airships  
Aladin 2 aircraft  
Alouette helicopters  
Alpha jet aircraft  
amphibious aircraft

## aircraft

AN-2 aircraft  
AN-22 aircraft  
AN-24 aircraft  
antisubmarine warfare aircraft  
Antonov aircraft  
Argosy MK-1 aircraft  
ASSET gliders  
ATLIT project  
ATR-72 aircraft  
attack aircraft  
AVRO 707 aircraft  
AWACS aircraft  
B-1 aircraft  
B-2 aircraft  
B-26 aircraft  
B-47 aircraft  
B-50 aircraft  
B-52 aircraft  
B-57 aircraft  
B-58 aircraft  
B-66 aircraft  
B-70 aircraft  
BAC 111 aircraft  
BAC aircraft  
balloons  
Beagle aircraft  
Beech 99 aircraft  
Beechcraft 18 aircraft  
Beechcraft aircraft  
Bell 214A helicopter  
Bell aircraft  
biplanes  
bird-aircraft collisions  
Boeing 707 aircraft  
Boeing 717 aircraft  
Boeing 720 aircraft  
Boeing 727 aircraft  
Boeing 733 aircraft  
Boeing 737 aircraft  
Boeing 747 aircraft  
Boeing 757 aircraft  
Boeing 767 aircraft  
Boeing 777 aircraft  
Boeing 2707 aircraft  
Boeing aircraft  
Bolkow aircraft  
bomber aircraft  
boostglide vehicles  
Breguet 940 aircraft  
Breguet 941 aircraft  
Breguet 1150 aircraft  
Breguet aircraft  
Buccaneer aircraft  
C-1A aircraft  
C-2 aircraft  
C-5 aircraft  
C-8A augmentor wing aircraft  
C-9 aircraft  
C-15 aircraft  
C-17 aircraft  
C-33 aircraft  
C-35 aircraft  
C-46 aircraft  
C-47 aircraft  
C-54 aircraft  
C-118 aircraft  
C-119 aircraft  
C-121 aircraft  
C-123 aircraft  
C-124 aircraft  
C-130 aircraft  
C-131 aircraft  
C-133 aircraft  
C-135 aircraft  
C-140 aircraft  
C-141 aircraft  
C-160 aircraft  
Canadair aircraft  
Canberra aircraft  
cargo aircraft  
ceiling (aircraft capability)  
Cessna 172 aircraft  
Cessna 205 aircraft  
Cessna 402B aircraft  
Cessna aircraft  
Cessna L-19 aircraft  
Chance-Vought aircraft  
Chinese aircraft  
CL-41 aircraft  
CL-44 aircraft  
CL-84 aircraft  
CL-600 challenger aircraft  
CL-823 aircraft  
COIN aircraft  
Comet 4 aircraft  
commercial aircraft  
commuter aircraft  
compound helicopters  
Concorde aircraft  
Curtiss-Wright aircraft  
CV-340 aircraft  
CV-440 aircraft  
CV-880 aircraft  
CV-990 aircraft  
D-558 aircraft  
Dassault aircraft  
DC 3 aircraft  
DC 7 aircraft  
DC 8 aircraft  
DC 9 aircraft  
DC 10 aircraft  
de Havilland aircraft  
DH 112 aircraft  
DH 115 aircraft  
DH 121 aircraft  
DH 125 aircraft  
DHC 2 aircraft  
DHC 4 aircraft  
DHC 5 aircraft  
DO-27 aircraft  
DO-28 aircraft  
DO-31 aircraft  
DO-328 aircraft  
Dornier aircraft  
Douglas aircraft  
drone aircraft  
E-2 aircraft  
E-3A aircraft  
E-4 aircraft  
Earth Resources Survey aircraft  
EH-101 helicopter  
Electra aircraft  
electronic aircraft  
European Airbus  
F-2 aircraft  
F-4 aircraft  
F-5 aircraft  
F-8 aircraft  
F-9 aircraft  
F-14 aircraft  
F-15 aircraft  
F-16 aircraft  
F-17 aircraft  
F-18 aircraft  
F-22 aircraft  
F-27 aircraft  
F-28 transport aircraft  
F-84 aircraft  
F-86 aircraft  
F-89 aircraft  
F-94 aircraft  
F-100 aircraft  
F-101 aircraft  
F-102 aircraft  
F-104 aircraft  
F-105 aircraft  
F-106 aircraft  
F-111 aircraft  
F-117A aircraft  
Fairchild-Hiller aircraft  
Fairey aircraft  
fan in wing aircraft  
FD 2 aircraft  
Fiat aircraft  
fighter aircraft  
Firebee 2 target drone aircraft  
flight test vehicles  
flying platforms  
Fokker aircraft  
Folding Fin aircraft rocket vehicle  
free wing aircraft  
FV-12A aircraft  
G-1 aircraft  
G-91 aircraft  
G-95/4 aircraft  
G-222 aircraft  
GA-5 aircraft  
general aviation aircraft  
General Dynamics aircraft  
GETOL aircraft  
gliders  
ground effect machines  
Grumman aircraft  
Gyrodyne aircraft  
H-17 helicopter  
H-19 helicopter  
H-43 helicopter  
H-53 helicopter  
H-54 helicopter  
H-56 helicopter  
H-60 Helicopter  
H-126 aircraft  
Hamburger aircraft  
Handley Page aircraft  
hang gliders  
Harrier aircraft  
Hawker Siddeley aircraft  
heavy lift helicopters  
Heinkel aircraft  
helicopters  
Helio aircraft  
HFB-320 aircraft  
HH-65 helicopter  
highly maneuverable aircraft  
Hiller aircraft  
hovercraft ground effect machines  
HP-115 aircraft  
HS-748 aircraft  
HS-801 aircraft  
Hughes aircraft  
hypersonic aircraft  
hypersonic gliders  
IL-14 aircraft  
IL-62 aircraft  
IL-76 aircraft  
IL-86 aircraft  
IL-96 aircraft  
Ilyushin aircraft  
inflatable gliders  
Jaguar aircraft  
JAS-39 aircraft  
jet aircraft  
jet aircraft noise  
jet provost aircraft  
Jetstream aircraft  
Jindivik target aircraft  
Kaman aircraft  
Kawasaki aircraft  
L-1011 aircraft  
L-2000 aircraft  
Lear jet aircraft  
lifting reentry vehicles  
light aircraft  
light helicopters  
light intratheater transport  
light transport aircraft  
Ling-Temco-Vought aircraft  
Lockheed aircraft  
Lockheed model 18 aircraft  
∞ low wing aircraft  
man powered aircraft  
Martin aircraft  
McDonnell aircraft  
McDonnell Douglas aircraft  
MD 11 aircraft  
MD 80 aircraft  
Mercure aircraft  
meteorological research aircraft  
MH-262 aircraft  
MiG aircraft  
Mil aircraft  
∞ military air facilities  
∞ military aircraft  
military helicopters  
monoplanes  
MRCA aircraft  
multiengine vehicles  
Mystere 50 aircraft  
Navion aircraft  
night flights (aircraft)  
Nihon aircraft  
noise prediction (aircraft)  
Nord 1500 aircraft  
Nord aircraft  
North American aircraft  
Northrop aircraft  
nuclear propelled aircraft

observation aircraft  
onboard equipment  
OV-1 aircraft  
OV-10 aircraft  
P-3 aircraft  
P-51 aircraft  
P-160 aircraft  
P-166 aircraft  
P-308 aircraft  
P-1127 aircraft  
P-1154 aircraft  
PA-34 Seneca aircraft  
passenger aircraft  
PD-808 aircraft  
Piaggio aircraft  
Piasecki aircraft  
pilotless aircraft  
Piper aircraft  
planetary aerial vehicles  
Potez aircraft  
powered lift aircraft  
propulsion  
Questol aircraft  
reconnaissance aircraft  
remotely piloted vehicles  
Republic aircraft  
research aircraft  
rigid rotor helicopters  
rocket planes  
rotary wing aircraft  
rotor systems research aircraft  
Ryan aircraft  
S-2 aircraft  
S-3 aircraft  
S-61 helicopter  
S-67 helicopter  
SA-321 helicopter  
SA-330 helicopter  
Saab 37 aircraft  
Saab 105 aircraft  
Saab aircraft  
SC-1 aircraft  
SC-5 aircraft  
SC-7 aircraft  
Schleicher aircraft  
Scimitar aircraft  
SE-210 aircraft  
short haul aircraft  
short takeoff aircraft  
Siebel aircraft  
Sikorsky aircraft  
Sikorsky Whirlwind helicopter  
single engine aircraft  
solar powered aircraft  
spanloader aircraft  
SR-71 aircraft  
submersible aircraft  
∞ subsonic aircraft  
Sud Aviation aircraft  
Sukhoi aircraft  
supersonic aircraft  
supersonic cruise aircraft research  
T-2 aircraft  
T-28 aircraft  
T-33 aircraft  
T-37 aircraft  
T-38 aircraft  
T-39 aircraft  
TACT program  
tailless aircraft  
tandem rotor helicopters  
tandem wing aircraft  
tanker aircraft  
target drone aircraft  
test vehicles  
tilt rotor aircraft  
Tilt Rotor Research Aircraft Program  
tilt wing aircraft  
training aircraft  
transatmospheric vehicles  
transport aircraft  
TS-11 aircraft  
TSR-2 aircraft  
TU-104 aircraft  
TU-124 aircraft  
TU-134 aircraft  
TU-144 aircraft  
TU-154 aircraft  
TU-204 aircraft

Tupolev aircraft  
turbofan aircraft  
turboprop aircraft  
U-2 aircraft  
U-10 aircraft  
ultralight aircraft  
unidentified flying objects  
utility aircraft  
V-22 aircraft  
V/STOL aircraft  
Valiant aircraft  
Vampire MK 35 aircraft  
VATOL aircraft  
VC-10 aircraft  
vertical takeoff aircraft  
Victor MK-1 aircraft  
Viscount aircraft  
VJ-101 aircraft  
Vulcan aircraft  
VZ-2 aircraft  
VZ-8 aircraft  
water takeoff and landing aircraft  
weapons delivery  
weather reconnaissance aircraft  
Weser aircraft  
Westland aircraft  
Westland ground effect machines  
Westland Whirlwind helicopter  
wing nacelle configurations  
∞ winged vehicles  
X-1 aircraft  
X-2 aircraft  
X-3 aircraft  
X-5 aircraft  
X-13 aircraft  
X-14 aircraft  
X-15 aircraft  
X-19 aircraft  
X-20 aircraft  
X-21 aircraft  
X-21A aircraft  
X-22 aircraft  
X-22A aircraft  
X-24 aircraft  
X-29 aircraft  
X-31 aircraft  
X-36 aircraft  
XC-142 aircraft  
XV-3 aircraft  
XV-4 aircraft  
XV-5 aircraft  
XV-8A aircraft  
XV-9A aircraft  
XV-11A aircraft  
XV-15 aircraft  
Yak 40 aircraft  
Yakovlev aircraft  
YC-14 aircraft  
YF-12 aircraft

**aircraft accident investigation**

GS investigation  
. accident investigation  
. . **aircraft accident investigation**  
RT ∞ aircraft  
aviation meteorology  
insurance (contracts)

**aircraft accidents**

GS accidents  
. **aircraft accidents**  
. . bird-aircraft collisions  
RT ∞ aircraft  
aircraft safety  
aviation meteorology  
collisions  
crash landing  
crashes  
crashworthiness  
ditching (landing)  
emergency landing  
flight hazards  
flight safety  
human factors engineering  
insurance (contracts)  
malfunctions  
midair collisions  
pilot error  
runway incursions

weather

**aircraft antennas**

GS antennas  
. **aircraft antennas**  
RT ∞ aircraft  
loop antennas  
microwave antennas  
missile antennas  
protuberances  
radar antennas  
radio antennas

**aircraft approach spacing**

GS spacing  
. **aircraft approach spacing**  
RT aeronautical satellites  
air traffic control  
airborne radar approach  
∞ aircraft  
aircraft safety  
airspace  
approach  
approach control  
collision avoidance  
flight safety  
glide paths  
ground based control  
instrument approach  
National Airspace Utilization System  
National Aviation System  
vortex advisory system  
vortex avoidance

*aircraft bases*

USE **military air facilities**

**aircraft brakes**

GS brakes (for arresting motion)  
. **aircraft brakes**  
. . split flaps  
. . wing flaps  
. . . leading edge flaps  
. . . leading edge slats  
. . . trailing edge flaps  
. . . vortex flaps  
RT aerodynamic brakes  
∞ aircraft  
antiskid devices  
ballutes  
drag chutes  
drag devices  
thrust reversal  
towed bodies  
wheel brakes

*aircraft cabins*

USE **aircraft compartments**

**aircraft carriers**

GS surface vehicles  
. **aircraft carriers**  
water vehicles  
. ships  
. . **aircraft carriers**  
RT ∞ aircraft  
arresting gear  
∞ carriers  
military air facilities  
∞ military aircraft  
∞ military vehicles  
navy  
nuclear powered ships

**aircraft communication**

DEF The conveyance of information to or from aircraft by radio or other signals.  
GS communicating  
. **aircraft communication**  
telecommunication  
. **aircraft communication**  
RT aeronautical satellites  
air traffic control  
airborne equipment  
∞ aircraft  
approach control  
avionics  
ground-air-ground communication  
radar beacons  
radio communication

## aircraft compartments

wireless communication

### aircraft compartments

- UF *aircraft cabins*  
*aircraft interiors*
- GS compartments
  - . **aircraft compartments**
- RT ∞ aircraft
  - bays (structural units)
  - cabin atmospheres
- ∞ cabins
  - cockpits
  - gondolas
  - pressurized cabins
  - windshields

### aircraft configurations

- UF *fixed-wing aircraft*
- GS **aircraft configurations**
  - . drooped airfoils
- RT aerodynamic configurations
  - aerodynamic interference
- ∞ aircraft
  - blended-wing-body configurations
  - compound helicopters
- ∞ configurations
  - control configured vehicles
  - flared bodies
- ∞ flight vehicles
  - joined wings
- ∞ low wing aircraft
  - missile configurations
  - propulsion system configurations
  - spacecraft configurations
  - under surface blowing
  - upper surface blowing
  - wing roots

### aircraft construction

USE **aircraft structures**

### aircraft construction materials

- DEF A general term designating the materials used in manufacturing an aircraft.
- GS **aircraft construction materials**
  - . airframe materials
- RT ∞ aircraft
  - airframes
  - aluminum-lithium alloys
  - ceramic matrix composites
  - composite materials
- ∞ construction materials
  - functionally gradient materials
  - fuselages
  - lithium alloys
- ∞ materials
  - materials selection
  - plastic aircraft structures
  - skin (structural member)
  - structural members
  - wings

### aircraft control

DEF To direct the movements of an aircraft with particular reference to changes in attitude and speed.

- UF *flap control*
- GS **aircraft control**
  - . helicopter control
- RT active control
  - air start
- ∞ aircraft
  - attitude control
  - automatic control
  - automatic flight control
- ∞ control
  - control equipment
  - control simulation
  - control stability
  - control sticks
  - controllability
  - DAST program
  - directional control
  - engine control
  - flight control
  - flight envelopes
  - flight instruments
  - fly by light control
  - fly by tube control
  - fly by wire control

ground based control  
in-flight simulation  
lateral control  
longitudinal control  
maneuverability  
manual control  
minor circle turning flight  
pilot induced oscillation  
radio control  
remote control  
stability augmentation  
turbojet engine control  
visual control

### aircraft design

DEF The act of conceiving and planning the structure, systems, and performance characteristics of an aircraft vehicle or any other apparatus, machine or contrivance intended to be borne up either by dynamic action of the air upon the object's surfaces, or by the object's own buoyancy.

#### GS aircraft design

. helicopter design  
acoustic retrofitting  
aerodynamic configurations  
aeroelastic research wings  
aeronautical engineering  
aeroquatic vehicles

#### ∞ aircraft

airfoils  
blended-wing-body configurations  
channel wings  
compound helicopters  
computer aided design  
control configured vehicles  
DAST program

∞ design  
design optimization  
engine airframe integration  
engine design  
flight tests  
free wing aircraft  
induced drag  
lofting  
missile design  
multidisciplinary design optimization  
product development  
rotor systems research aircraft  
shape optimization  
short haul aircraft  
streamlining  
structural design  
systems engineering  
Terminal Configured Vehicle Program  
transatmospheric vehicles  
vortex sheets  
weight reduction  
YF-12 aircraft

### aircraft detection

GS detection

- . **aircraft detection**

RT ∞ aircraft

- ∞ detectors
  - F-117A aircraft
  - IFF systems (identification)
  - infrared suppression
  - tracking (position)

### Aircraft Energy Efficiency program

USE **ACEE program**

### aircraft engines

UF *aircraft power sources*

GS engines

- . **aircraft engines**
- . . convertible fan-shaft engines
- . . helicopter engines
- . . J-52 engine
- . . J-58 engine
- . . J-97 engine
- . . T-34 engine
- . . T-38 engine
- . . T-55 engine
- . . T-63 engine
- . . T-76 engine
- . . T-78 engine
- . . TF-30 engine
- . . TF-34 engine

. . TF-41 engine  
. . variable cycle engines  
. . variable stream control engines

RT ACEE program

- air start

∞ aircraft

- engine airframe integration
- gas turbine engines
- hydrogen engines
- infrared suppression
- internal combustion engines
- jet engines
- jet propulsion
- laser propulsion
- nuclear propulsion
- piston engines

∞ power supplies

- quiet engine program
- rocket engines
- rotary engines
- T-58 engine
- topping cycle engines
- turbine engines
- Wankel engines

### aircraft equipment

GS onboard equipment

- . **aircraft equipment**
- . . bombing equipment
- . . ejection seats
- . . flying ejection seats
- . . TERCOM

RT airborne equipment

- ∞ aircraft
  - aircraft hydraulic systems
  - aircraft lights
  - aircraft power supplies
  - aircraft tires
  - automatic landing control
  - automatic pilots
  - avionics
  - commonality
  - display devices
- ∞ equipment
  - flight instruments
  - landing aids
  - landing instruments
  - Light Airborne Multipurpose System
  - navigation aids
  - navigation instruments
  - radio direction finders

### aircraft fuel systems

GS fuel systems

- . **aircraft fuel systems**

RT ∞ aircraft

- fuel pumps
- fuel tank pressurization
- fuel tanks
- fuel valves

∞ systems

### aircraft fuels

GS fuels

- . **aircraft fuels**

RT ∞ aircraft

- antimisting fuels
- automobile fuels
- hydrocarbon fuels
- jet engine fuels
- liquid fuels
- liquid rocket propellants
- monopropellants
- slurry propellants
- solid propellants
- tanker aircraft

### aircraft guidance

GS guidance (motion)

- . **aircraft guidance**

RT air traffic control

- ∞ aircraft
  - approach control
  - automated en route ATC
  - collision avoidance
- ∞ indicators
  - instrument landing systems
  - radar approach control
  - radar navigation
  - radarscopes

- radio navigation
- aircraft hangars*
- USE **hangars**
- aircraft hazards**
- GS hazards
  - . **aircraft hazards**
  - . . runway incursions
- RT air traffic
- ∞ aircraft
  - aircraft icing
  - aviation meteorology
  - bird-aircraft collisions
  - birds
  - collisions
  - crash landing
  - crashes
  - flight hazards
  - flight safety
  - foreign bodies
  - human factors engineering
  - malfunctions
  - midair collisions
  - noise (sound)
  - operational hazards
  - refueling
  - threat evaluation
  - toxic hazards
  - weather
- aircraft hydraulic systems**
- GS hydraulic equipment
  - . **aircraft hydraulic systems**
- RT actuators
- ∞ aircraft
  - aircraft equipment
  - servocontrol
  - servomechanisms
- ∞ systems
- aircraft icing**
- (added August 1991)
- DEF Accumulation of ice on aircraft external surfaces, propellers and engine inlets from freezing rain or flight through inclement weather.
- UF *wing icing*
- GS ice formation
  - . **aircraft icing**
- RT aircraft hazards
- aircraft safety
- aviation meteorology
- deicers
- deicing
- flight conditions
- flight hazards
- flight safety
- ice prevention
- aircraft industry**
- GS industries
  - . aerospace industry
  - . . **aircraft industry**
- RT aeronautical engineering
- ∞ aircraft
  - aircraft production costs
- aircraft instruments**
- DEF Any electronic or mechanically-based instrument or instrument system designed for detecting, measuring, displaying, recording, telemetering, processing, or analyzing different values or quantities encountered in the flight of an aircraft; often supporting the general control of the aircraft.
- GS **aircraft instruments**
  - . approach indicators
  - . automatic pilots
  - . flight recorders
  - . . flight load recorders
  - . rate of climb indicators
- RT airborne surveillance radar
- ∞ aircraft
  - altimeters
  - anemometers
  - attitude indicators
  - automatic flight control
  - avionics
  - compasses
  - display devices
- flight control
- flight instruments
- flight paths
- flight test instruments
- I2S cameras
- indicating instruments
- instrument approach
- instrument landing systems
- ∞ instruments
  - landing aids
  - landing instruments
  - laser altimeters
  - light emitting diodes
- ∞ measurement
  - measuring instruments
  - monitors
  - navigation aids
  - navigation instruments
  - position indicators
  - radar
  - radio altimeters
  - recording instruments
  - speed indicators
  - tachometers
- aircraft interiors*
- USE **aircraft compartments**
- aircraft landing**
- GS landing
  - . **aircraft landing**
- RT air cushion landing systems
- all-weather landing systems
- blind landing
- ceilings (meteorology)
- crashworthiness
- emergency landing
- enhanced vision
- glide landings
- hard landing
- instrument landing systems
- landing aids
- landing mats
- landing radar
- low visibility
- microwave landing systems
- runway alignment
- soft landing
- spacecraft landing
- touchdown
- vertical landing
- vortex avoidance
- water landing
- aircraft launching devices**
- UF *takeoff systems*
- GS launchers
  - . **aircraft launching devices**
  - . . JATO engines
- RT catapults
- aircraft lights**
- GS lighting equipment
  - . luminaires
  - . . **aircraft lights**
- RT ∞ aircraft
  - aircraft equipment
  - beacons
- aircraft maintenance**
- GS maintenance
  - . **aircraft maintenance**
- RT ∞ aircraft
  - checkout
  - flight operations
  - ground support equipment
  - logistics
  - preventive maintenance
- aircraft maneuvers**
- GS maneuvers
  - . **aircraft maneuvers**
- RT ∞ aircraft
  - approach control
  - flight characteristics
  - flight envelopes
  - flight paths
  - formation flying
  - highly maneuverable aircraft
  - maneuverability
- obstacle avoidance
- trajectory optimization
- transition flight
- turning flight
- X-31 aircraft
- aircraft models**
- GS models
  - . **aircraft models**
- RT dynamic models
- mathematical models
- powered models
- scale models
- semispan models
- spacecraft models
- wind tunnel models
- aircraft noise**
- GS elastic waves
  - . sound waves
  - . . noise (sound)
  - . . . **aircraft noise**
  - . . . . blade slap noise
  - . . . . jet aircraft noise
  - . . . . propeller noise
  - . . . . sonic booms
- RT acoustic retrofitting
- aeroacoustics
- aerodynamic noise
- ∞ aircraft
  - coaxial nozzles
  - engine noise
  - Ffowcs Williams-Hawkings equation
  - footprints
  - jet aircraft
  - mufflers
  - noise intensity
  - noise measurement
  - noise prediction (aircraft)
  - noise reduction
  - synchrophasing
- aircraft noise prediction*
- USE **noise prediction (aircraft)**
- aircraft parts**
- RT ∞ aircraft
  - airfoils
  - airframes
  - channel wings
  - control surfaces
  - fuselages
  - landing gear
  - oblique wings
  - protuberances
  - swing tail assemblies
  - swing wings
  - tail assemblies
  - wings
- aircraft performance**
- DEF The manner or effectiveness with which an aircraft vehicle or any airborne structure, machine, or contrivance functions while in operation.
- GS **aircraft performance**
  - . helicopter performance
- RT aerodynamic stalling
- ∞ aircraft
  - aircraft spin
  - airspeed
  - controllability
  - Cooper-Harper ratings
  - distance
  - flight characteristics
  - flight envelopes
  - maneuverability
  - minimum drag
  - payloads
- ∞ performance
  - pilot performance
  - pilot ratings
  - specifications
  - takeoff runs
- aircraft pilots**
- UF *aviators*
- copilots*
- jet pilots*
- GS personnel



## aircraft power supplies

- . flying personnel
  - . . . pilots (personnel)
  - . . . . **aircraft pilots**
  - . . . . test pilots
  - . operators (personnel)
  - . . . pilots (personnel)
  - . . . . **aircraft pilots**
  - . . . . test pilots
- RT ∞ aircraft  
aviation psychology  
flight crews  
∞ pilots

### aircraft power sources

- USE **aircraft engines**

### aircraft power supplies

DEF Electric power sources for the normal operation of aircraft.

- GS electric power supplies  
. **aircraft power supplies**
- RT aircraft equipment  
auxiliary power sources  
electric generators  
∞ power supplies

### aircraft production

- UF *fuselage mounting*
- RT ∞ aircraft  
costs  
equipment specifications  
product development  
∞ production  
production engineering

### aircraft production costs

- GS costs  
. production costs  
. . . **aircraft production costs**
- RT ∞ aircraft  
aircraft industry  
cost estimates  
efficiency  
∞ engineering  
financial management  
industries  
manufacturing  
production engineering  
production management  
productivity

### aircraft reliability

- UF *airworthiness*  
*airworthiness requirements*
- GS reliability  
. **aircraft reliability**
- RT ∞ aircraft  
certification  
circuit reliability  
component reliability  
helicopter performance  
quality control  
structural reliability  
total quality management  
vulnerability

### aircraft runup

- DEF Final engine check prior to takeoff.
- GS preflight operations  
. **aircraft runup**
- RT ∞ aircraft  
engine noise  
engine tests  
ground tests  
jet aircraft noise

### aircraft safety

DEF Techniques used to prevent aircraft failures or accidents; the degree to which an aircraft is free of the risk of malfunction or accidents.

- GS safety  
. **aircraft safety**
- RT abort apparatus  
aerospace safety  
air piracy  
air traffic control  
∞ aircraft  
aircraft accidents  
aircraft approach spacing

- aircraft icing  
aircraft spin  
all-weather landing systems  
arresting gear  
Beacon Collision Avoidance System  
collision avoidance  
collisions  
crash landing  
crashes  
crashworthiness  
ejection seats  
emergency landing  
flight hazards  
flight safety  
flying ejection seats  
landing aids  
landing radar  
microwave landing systems  
midair collisions  
National Airspace System  
navigation aids  
runway incursions  
safety devices  
solar compasses  
terrorism  
threat evaluation  
weather  
wheel brakes

### aircraft specifications

- GS specifications  
. **aircraft specifications**
- RT ∞ aircraft  
airspeed  
ceiling (aircraft capability)  
controllability  
distance  
flight characteristics  
payloads

### aircraft spin

DEF A prolonged stall in fixed-wing aircraft characterized by a sustained spiral descent, usually with the nose down.

- RT aerodynamic stalling  
∞ aircraft  
aircraft performance  
aircraft safety  
control stability  
controllability  
crash landing  
flight hazards  
flight safety  
hazards  
maneuvers  
spin dynamics

### aircraft stability

DEF The property of an aircraft to maintain its attitude or to resist displacement, and if displaced, to develop forces and moments tending to restore the original condition.

- GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . **aircraft stability**  
. . . . hovering stability  
stability  
. dynamic stability  
. . motion stability  
. . . **aircraft stability**  
. . . . hovering stability
- RT aerodynamic balance  
aerodynamic stability  
∞ aircraft  
attitude stability  
buffeting  
control stability  
controllability  
counterbalances  
directional stability  
flight envelopes  
horizontal flight  
lateral stability  
liquid sloshing  
longitudinal stability  
low speed stability  
pilot induced oscillation  
static stability  
structural stability

- turning flight  
upper surface blown flaps  
wind tunnel stability tests  
wing rock

### aircraft structures

- UF *aircraft construction*
- GS **aircraft structures**  
. airframes  
. fuselages  
. plastic aircraft structures
- RT aerodynamic interference  
aeroelasticity  
afterbodies  
∞ aircraft  
airfoils  
boron-epoxy composites  
canard configurations  
canopies  
centerbodies  
channel wings  
control surfaces  
fairings  
forebodies  
hulls (structures)  
interference fit  
leading edge flaps  
noses (forebodies)  
oblique wings  
pylon mounting  
shells (structural forms)  
spacecraft structures  
streamlining  
∞ structures  
swing tail assemblies  
swing wings  
tail assemblies  
wings

### aircraft survivability

- RT ∞ aircraft  
combat  
∞ construction materials  
durability  
flight control  
helicopters  
life (durability)  
∞ military aircraft  
plastic aircraft structures  
reinforced plastics  
reliability  
spacecraft survivability  
survival  
survival equipment  
vulnerability

### aircraft tires

- GS tires  
. **aircraft tires**
- RT ∞ aircraft  
aircraft equipment  
landing gear  
vehicle wheels

### aircraft wakes

- GS wakes  
. **aircraft wakes**  
. . helicopter wakes  
. . slipstreams  
. . . propeller slipstreams
- RT ∞ aircraft  
hypersonic wakes  
laminar wakes  
supersonic wakes  
turbulent wakes  
vortex advisory system  
vortex alleviation

### aircrews

- USE **flight crews**

### airdrops

- RT air cargo  
cargo  
delivery  
drag chutes  
parachutes

- parafoils
- airfield surface movements**
  - RT air cargo
  - airports
  - hangars
  - materials handling
  - mobile lounges
  - runway incursions
  - runways
  - ∞ surfaces
  - taxiing
- airfields*
- USE **airports**
- airfoil characteristics*
- USE **airfoils**
- airfoil fences**
  - GS airfoils
    - . **airfoil fences**
  - RT boundary layer control
  - ∞ fences
    - vortex generators
    - wings
- airfoil oscillations**
  - DEF Periodic motions experienced by airfoils in aerodynamic conditions.
  - GS oscillations
    - . **airfoil oscillations**
    - . . wing oscillations
    - . . . wing rock
  - RT aerodynamic stability
    - aeroelasticity
    - aeroservoelasticity
    - flapping
    - flutter
    - flutter analysis
    - rotary stability
    - structural vibration
    - undamped oscillations
    - vibration
    - vibration mode
- airfoil profiles**
  - UF *aerodynamic chords*
  - airfoil sections*
  - airfoil thickness*
  - Clark Y airfoil*
  - GS **airfoil profiles**
    - . wing profiles
    - . . wing span
  - RT aerodynamic interference
    - airfoils
    - blade tips
    - ∞ cross sections
      - Joukowski transformation
      - Kutta-Joukowski condition
      - Lighthill method
      - nose tips
    - ∞ profiles
      - shape optimization
      - streamlining
      - supercritical airfoils
      - Theodorsen transformation
      - thickness
      - thickness ratio
      - thin airfoils
      - thin wings
      - tips
      - wedges
      - wing tips
  - airfoil sections*
  - USE **airfoil profiles**
  - airfoil thickness*
  - USE **airfoil profiles**
  - airfoils**
    - DEF Structures, pieces, or bodies, originally likened to foils or leaves in being wide and thin, designed to obtain a useful reaction on themselves in their motion through the air. Used for airfoil characteristics.
    - UF *airfoil characteristics*
    - GS **airfoils**
      - . aerial rudders
    - . ailerons
    - . . flaperons
    - . . spoiler slot ailerons
    - . airfoil fences
    - . circulation control airfoils
    - . . circulation control rotors
    - . drooped airfoils
    - . elevators (control surfaces)
    - . elevons
    - . flaps (control surfaces)
    - . . externally blown flaps
      - . . . upper surface blown flaps
    - . . flaperons
    - . . jet flaps
    - . . split flaps
    - . . wing flaps
      - . . . leading edge flaps
      - . . . leading edge slats
      - . . . trailing edge flaps
      - . . . vortex flaps
    - . horizontal tail surfaces
    - . laminar flow airfoils
    - . propeller blades
    - . spoilers
    - . supercritical airfoils
    - . . supercritical wings
    - . supersonic airfoils
    - . tabs (control surfaces)
    - . thin airfoils
    - . . thin wings
      - . . . infinite span wings
    - . wings
      - . . aeroelastic research wings
      - . . cambered wings
      - . . caret wings
      - . . channel wings
      - . . cruciform wings
      - . . fixed wings
      - . . flexible wings
        - . . . parawings
        - . . . GAW-1 airfoil
        - . . . GAW-2 airfoil
      - . . joined wings
      - . . low aspect ratio wings
        - . . . delta wings
        - . . . trapezoidal wings
      - . . mission adaptive wings
      - . . oblique wings
      - . . rigid wings
      - . . rotary wings
        - . . . circulation control rotors
        - . . . lifting rotors
        - . . . bearingless rotors
        - . . . rigid rotors
        - . . . tilting rotors
        - . . . tip driven rotors
        - . . . x wing rotors
      - . . slender wings
      - . . infinite span wings
      - . . supercritical wings
      - . . swept wings
        - . . . swept forward wings
          - . . . . trapezoidal wings
          - . . . . sweptback wings
          - . . . . arrow wings
          - . . . . delta wings
          - . . . . trapezoidal wings
        - . . . swing wings
      - . . thin wings
        - . . . infinite span wings
        - . . . twisted wings
      - . . uncambered wings
        - . . . ring wings
        - . . . unswept wings
        - . . . infinite span wings
        - . . . rectangular wings
        - . . . ring wings
        - . . . variable sweep wings
    - RT aerodynamic configurations
      - aerodynamics
      - aircraft design
      - aircraft parts
      - aircraft structures
      - airfoil profiles
      - aspect ratio
      - ∞ blades
        - blade-vortex interaction
        - blunt leading edges
        - blunt trailing edges
  - body-wing configurations
  - camber
  - control surfaces
  - deicers
  - deicing
  - fins
  - ∞ foils
    - foils (materials)
    - guide vanes
    - hydrofoils
    - interactional aerodynamics
    - jet vanes
    - leading edge thrust
    - leading edges
    - lift
    - lifting bodies
    - Lighthill method
    - monoplanes
    - rotor blades (turbomachinery)
    - rotors
    - rudders
    - sharp leading edges
    - stabilizers (fluid dynamics)
    - streamlined bodies
    - streamlining
    - tail assemblies
    - trailing edges
    - turbomachine blades
    - vanes
    - waveriders
    - wedges
  - airframe materials**
    - GS aircraft construction materials
      - . **airframe materials**
    - RT airframes
      - aluminum-lithium alloys
      - composite materials
    - ∞ construction materials
      - functionally gradient materials
      - glass fiber reinforced plastics
    - ∞ materials
      - materials selection
      - structural design
      - structural members
  - airframes**
    - DEF The assembled structural and aerodynamic components of an aircraft or rocket vehicle that support the different systems and subsystems integral to the vehicle.
    - GS aircraft structures
      - . **airframes**
      - frames
      - . **airframes**
    - RT aircraft construction materials
      - aircraft parts
      - airframe materials
      - bays (structural units)
      - canopies
      - control surfaces
      - engine airframe integration
      - fins
      - fuselages
      - landing gear
      - missile bodies
      - missile structures
      - nacelles
      - protuberances
      - tail assemblies
      - wing nacelle configurations
      - wings
  - Airgeep aircraft*
  - USE **VZ-8 aircraft**
  - airglow**
    - DEF The quasi-steady radiant emission from the upper atmosphere as distinguished from the sporadic emission of the auroras. Used for atmospheric emission.
    - UF *atmospheric emission*
    - GS atmospheric radiation
      - . sky radiation
      - . . **airglow**
        - . . . geocoronal emissions
        - . . . nightglow
        - . . . twilight glow
      - electromagnetic radiation

## airline operations

- . light (visible radiation)
- . . . sky radiation
- . . . . **airglow**
- . . . . . geocoronal emissions
- . . . . . nightglow
- . . . . . twilight glow

RT

- aeronomy
- atmospheric ionization
- auroras
- chemiluminescence
- Earth atmosphere
- emission
- Fabry-Perot spectrometers
- light emission
- night sky
- oxygen spectra
- radiative recombination
- Rayleigh scattering
- sky brightness

### airline operations

RT

- air cargo
- air traffic
- air transportation
- civil aviation
- commercial aircraft
- operating costs
- operational problems
- ∞ operations
- passengers
- short haul aircraft

### airlock modules

DEF Modular chambers capable of being hermetically sealed that provide for passage between two places of different pressure as between an altitude chamber and the outside atmosphere.

GS

- compartments
- . air locks
- . . **airlock modules**
- modules
- . **airlock modules**

RT

- Apollo applications program
- multiple docking adapters
- Saturn 1 workshop
- Saturn 5 workshop
- Saturn workshops
- Skylab 1
- Skylab 2
- Skylab 3
- Skylab 4
- Skylab program
- space station modules
- spacecraft docking modules

### airport beacons

GS

- landing aids
- . **airport beacons**
- . . discrete address beacon system
- navigation aids
- . beacons
- . . **airport beacons**
- . . . discrete address beacon system

RT

- radio beacons
- solar compasses

### airport lights

GS

- landing aids
- . **airport lights**
- . . runway lights
- lighting equipment
- . luminaires
- . . **airport lights**
- . . . runway lights

RT

- searchlights

### airport planning

GS

- planning
- . **airport planning**

RT

- ground support equipment
- heliports
- land use
- sites

### airport security

DEF Organization of trained security personnel, surveillance and screening devices, and procedures used for the protection of airport and airline property, aircraft, passengers, employ-

ees, and visitors from injury, air piracy, and other unauthorized acts.

GS

- security
- . **airport security**

RT

- air piracy
- airports
- explosives detection
- ion mobility spectroscopy
- protection
- terrorism
- vulnerability

### airport surface detection equipment

UF *ASDE*

RT

- air traffic control
- ∞ equipment
- ground based control
- radar equipment
- runway incursions
- search radar
- ∞ surfaces
- surveillance radar

### airport towers

GS

- towers
- . **airport towers**

RT

- air traffic control
- air traffic controllers (personnel)
- airports
- ground based control
- heliports
- landing aids
- traffic control

### airports

DEF An area of land or water that is used, or intended to be used, for the landing and takeoff of aircraft, including buildings and facilities, if any.

UF *airfields*

GS

- airports**
- . heliports

RT

- ∞ aeronautics
- air traffic control
- airfield surface movements
- airport security
- airport towers
- ∞ facilities
- hangars
- instrument landing systems
- landing aids
- landing mats
- military air facilities
- mobile lounges
- mooring
- National Airspace System
- navigation aids
- ∞ ports
- runways
- site selection
- ∞ strip

*AIRS (reconnaissance sys)*

USE **Airborne Integrated Reconnaissance System**

### airships

DEF Propelled and steerable dirigibles dependent on gases for flotation. Used for aerostats and dirigibles.

UF *aerostats*  
*dirigibles*

GS

- airships**
- . heavy lift airships

RT

- ∞ aircraft
- balloons
- gondolas
- inflatable structures
- ∞ military aircraft

### airspace

DEF The atmosphere above a particular portion of the earth, usually defined by the boundaries of an area on the surface projected perpendicularly upward.

RT

- air law
- air traffic
- air traffic control
- aircraft approach spacing
- boundaries
- collision avoidance

flight paths  
National Airspace System  
National Airspace Utilization System

### airspeed

GS

- rates (per time)
- . **airspeed**
- velocity
- . **airspeed**

RT

- aerodynamic stalling
- aircraft performance
- aircraft specifications
- boundary layer separation
- flight characteristics
- ground speed
- high speed
- low speed
- Mach number
- wind velocity

*airworthiness*

USE **aircraft reliability**

*airworthiness requirements*

USE **aircraft reliability**

### Airy function

GS

- analysis (mathematics)
- . complex variables
- . . **Airy function**
- functions (mathematics)
- . **Airy function**

RT

- cylindrical bodies
- differential equations
- elastic properties
- harmonic functions
- Poisson ratio
- stress analysis

### Aitken nuclei

DEF Microscopic particles in the atmosphere which serve as condensation nuclei for droplet growth during the rapid adiabatic expansion produced by an Aitken dust counter.

GS

- condensation nuclei
- . **Aitken nuclei**

RT

- aerosols
- atmospheric chemistry
- atmospheric composition
- cloud physics
- coagulation
- condensates
- crystal growth
- dust
- ice nuclei
- nucleation
- ∞ nuclei
- supercooling

### AJ-10 engine

GS

- engines
- . rocket engines
- . . booster rocket engines
- . . . **AJ-10 engine**
- . . . liquid propellant rocket engines
- . . . **AJ-10 engine**

RT

- tartar missile

*AJ-1000 engine*

USE **M-1 engine**

*Akebono satellite*

USE **EXOS-D satellite**

### akermanite

DEF A mineral of the melilite group. It is isomorphous with gehlenite.

GS

- calcium compounds
- . calcium carbonates
- . . **akermanite**
- . calcium oxides
- . . **akermanite**
- carbon compounds
- . carbonates
- . . calcium carbonates
- . . . **akermanite**
- chalcogenides
- . oxides
- . . metal oxides
- . . . alkaline earth oxides

- . . . . calcium oxides
- . . . . . **akermanite**
- . . . . magnesium oxides
- . . . . . **akermanite**
- magnesium compounds
- . magnesium oxides
- . . **akermanite**
- minerals
- . **akermanite**
- RT silicates
- silicon compounds
- silicon oxides
- Alabama**
- GS nations
- . United States
- . . **Alabama**
- RT Gulf of Mexico
- Tennessee Valley (AL-KY-TN)
- Aladin 2 aircraft**
- GS transport aircraft
- . **Aladin 2 aircraft**
- V/STOL aircraft
- . short takeoff aircraft
- . . **Aladin 2 aircraft**
- RT ∞ aircraft
- Alais meteorite**
- GS celestial bodies
- . meteorites
- . . stony meteorites
- . . . carbonaceous meteorites
- . . . . carbonaceous chondrites
- . . . . . **Alais meteorite**
- . . . . chondrites
- . . . . carbonaceous chondrites
- . . . . . **Alais meteorite**
- alanine**
- GS acids
- . amino acids
- . . **alanine**
- . . . phenylalanine
- . . . carboxylic acids
- . . **alanine**
- . . . phenylalanine
- organic compounds
- . amino acids
- . . **alanine**
- . . . phenylalanine
- . . . carboxylic acids
- . . **alanine**
- . . . phenylalanine
- RT proteins
- alarms*
- USE **warning systems**
- Alaska**
- GS nations
- . United States
- . . **Alaska**
- RT Aleutian Islands (US)
- Beaufort Sea (North America)
- Chena River Basin (AK)
- Cook Inlet (AK)
- Gulf of Alaska
- Prince William Sound (AK)
- Wrangell Mountains (AK)
- Albania**
- GS nations
- . **Albania**
- RT Europe
- albedo**
- DEF The ratio of the amount of electromagnetic radiation reflected by a body to the amount incident upon it. It is often expressed as a percentage, as, the albedo of the Earth is 34 percent.
- GS **albedo**
- . cosmic ray albedo
- . Earth albedo
- . lunar albedo
- RT absorptance
- cosmic rays
- Earth radiation budget experiment
- MISR (radiometry)
- optical properties
- planetary radiation
- reflectance
- solar radiation
- surface properties
- Alberta**
- GS nations
- . Canada
- . . **Alberta**
- albinism**
- GS diseases
- . **albinism**
- RT pigments
- skin (anatomy)
- albumins**
- GS biopolymers
- . proteins
- . . **albumins**
- organic compounds
- . proteins
- . . **albumins**
- RT elastin
- alcoholates*
- USE **alkoxides**
- alcohols**
- GS hydroxyl compounds
- . **alcohols**
- . . ethyl alcohol
- . . glycols
- . . isopropyl alcohol
- . . methyl alcohol
- . . phenols
- . . bisphenols
- . . cresols
- . . phloroglucinol
- . . thymol
- . . polyvinyl alcohol
- . . triols
- . . cyanuric acid
- RT alkoxides
- carbohydrates
- gasohol (fuel)
- glycerols
- hydroxyl radicals
- methoxy systems
- organic compounds
- thiols
- aldehydes**
- DEF Carbonyl groups to which a hydrogen atom is attached; the first stage of an alcohol; -CHO.
- GS **aldehydes**
- . acetaldehyde
- . acroleins
- . chloral
- . formaldehyde
- RT acetyl compounds
- furfuryl alcohol
- organic compounds
- retinene
- aldolase**
- GS biopolymers
- . proteins
- . . enzymes
- . . . **aldolase**
- organic compounds
- . proteins
- . . enzymes
- . . . **aldolase**
- RT muscles
- aldosterone**
- GS organic compounds
- . lipids
- . . steroids
- . . . corticosteroids
- . . . . **aldosterone**
- secretions
- . endocrine secretions
- . . hormones
- . . . corticosteroids
- . . . . **aldosterone**
- RT adrenal metabolism
- electrolyte metabolism
- alertness**
- RT arousal
- attention
- situational awareness
- wakefulness
- Aleutian Islands (US)**
- GS landforms
- . islands
- . . **Aleutian Islands (US)**
- RT Alaska
- archipelagoes
- island arcs
- United States
- alexandrite**
- (added November 1992)
- DEF A transparent variety of chrysoberl that has a grass-green or emerald green color in daylight and wine-red to brownish-red color by transmitted or incandescent artificial light.
- GS aluminum compounds
- . aluminum oxides
- . . **alexandrite**
- . . beryl
- . . . **alexandrite**
- beryllium compounds
- . beryl
- . . **alexandrite**
- . . beryllium oxides
- . . . **alexandrite**
- chalcogenides
- . oxides
- . . metal oxides
- . . . alkaline earth oxides
- . . . . beryllium oxides
- . . . . . **alexandrite**
- . . . . aluminum oxides
- . . . . . **alexandrite**
- minerals
- . beryl
- . . **alexandrite**
- silicon compounds
- . silicates
- . . beryl
- . . . **alexandrite**
- RT laser materials
- alfalfa**
- GS farm crops
- . **alfalfa**
- plants (botany)
- . **alfalfa**
- RT agriculture
- blight
- botany
- crop growth
- crop vigor
- ∞ crops
- curing
- Earth resources
- ∞ food
- grasses
- irrigation
- seeds
- Alfven waves*
- USE **magnetohydrodynamic waves**
- Al/GaAs*
- USE **aluminum gallium arsenides**
- algae**
- DEF Any plants of a group of unicellular and multicellular primitive organisms that include the Chlorella, Scenedesmus, and other genera. Used for algal bloom.
- UF *algal bloom*
- diatoms (unicellular plants)*
- GS plants (botany)
- . **algae**
- . . blue green algae
- . . . anabaena
- . . . Microcystis
- . . . Nostoc
- . . Chlorella
- . . Dunaliella
- . . porphyra

## algebra

. . . scenedesmus  
RT biochemical oxygen demand  
bioconversion  
chlorophylls  
Euglena  
lichens  
marine biology  
microorganisms  
photosynthesis  
phytoplankton  
plankton  
plastids  
thermophiles  
thermophilic plants  
water pollution

*algal bloom*  
USE **algae**

**algebra**  
GS **algebra**  
. binomial theorem  
. current algebra  
. determinants  
. group theory  
. homomorphisms  
. . . automorphisms  
. . . monoids  
. . . subgroups  
. lie groups  
. spinor groups  
. linear equations  
. . Frowcs Williams-Hawkings equation  
. linear evolution equations  
. . Riccati equation  
. linear transformations  
. nonlinear equations  
. . cubic equations  
. . Duffing differential equation  
. . Monge-Ampere equation  
. . nonlinear evolution equations  
. . quadratic equations  
. . quartic equations  
. polynomials  
. binomials  
. dyadics  
. Hermitian polynomial  
. tensors  
. stress tensors  
. vector spaces  
. Banach space  
. . Hilbert space  
. . . Sobolev space  
. matrices (mathematics)  
. . adjoints  
. . canonical forms  
. . eigenvalues  
. . eigenvectors  
. . Hessian matrices  
. . Jordan form  
. . stiffness matrix  
. . Stokes theorem (vector calculus)  
. U spin space  
. vectors (mathematics)  
. . eigenvectors  
. . state vectors  
. . vorticity  
RT analysis (mathematics)  
∞ analyzing  
Boolean algebra  
coordinates  
functions (mathematics)  
homotropy  
∞ mathematics  
Schwartz inequality  
∞ science  
semimpiirical equations  
∞ space  
sums  
uniqueness theorem

## Algeria

GS nations  
. **Algeria**  
RT Africa

## ALGOL

UF *algorithmic oriented language*  
GS languages

. programming languages  
. . **ALGOL**  
RT computer programming  
machine oriented languages

## Algol engine

GS engines  
. rocket engines  
. . booster rocket engines  
. . . **Algol engine**  
. . solid propellant rocket engines  
. . . **Algol engine**  
RT Blue Scout rocket vehicle  
Little Joe 2 launch vehicle  
Scout launch vehicle

## algorithmic oriented language

USE **ALGOL**

## algorithms

DEF Special mathematical procedures for solving a particular type of problem.  
GS mathematical logic  
. **algorithms**  
. . backpropagation (artificial intelligence)  
. . genetic algorithms  
. . greedy algorithms  
. . parsing algorithms  
. . simplex method  
. . sorting algorithms  
RT computer programming  
computer programs  
computer systems programs  
computerized simulation  
conjugate gradient method  
data conversion routines  
differential analyzers  
factorization  
fuzzy sets  
fuzzy systems  
Hessian matrices  
mean square values  
numerical analysis  
numerical differentiation  
parameterization  
robustness (mathematics)  
state estimation  
systolic arrays

## alignment

GS **alignment**  
. self alignment  
RT adjusting  
bearing (direction)  
clearances  
collimation  
correction  
directivity  
fitting  
horizontal orientation  
instrument orientation  
look angles (electronics)  
∞ orientation  
ply orientation  
polarization (spin alignment)  
positioning  
vertical orientation

## ∞ aliphatic compounds

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aliphatic hydrocarbons  
amines  
fatty acids  
molecular chains  
organic compounds

## aliphatic hydrocarbons

GS organic compounds  
. hydrocarbons  
. . **aliphatic hydrocarbons**  
. . . alkanes  
. . . . butanes  
. . . . cetane  
. . . . ethane  
. . . . heptanes  
. . . . methane  
. . . . nitropropane  
. . . . nonanes

. . . . octanes  
. . . . paraffins  
. . . . . ceresin  
. . . . . pentanes  
. . . . . neopentane  
. . . . propane  
. . . alkenes  
. . . . butenes  
. . . . ethylene  
. . . . vinylidene  
. . . . hexenes  
. . . . propylene  
. . . . trienes  
. . . alkynes  
. . . . acetylene  
. . . . oxyacetylene  
. . . dienes  
. . . . butadiene  
. . . . heptadiene  
. . . . hexadiene  
. . . . polybutadiene  
. . . carotenoids  
RT ∞ aliphatic compounds  
terpenes

## alkali halides

GS halogen compounds  
. halides  
. metal halides  
. . **alkali halides**  
. . . cesium halides  
. . . . cesium bromides  
. . . . cesium fluorides  
. . . . cesium iodides  
. . . . potassium iodides  
. . . . sodium bromides  
. . . . sodium chlorides  
. . . . sodium fluorides  
. . . . sodium iodides

## ∞ alkali metal compounds

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *Group 1A compounds*  
RT cesium compounds  
∞ chemical compounds  
fullerides  
lithium compounds  
∞ metal compounds  
potassium compounds  
rubidium compounds  
sodium compounds

## alkali metals

DEF Metals in group IA of the periodic system; namely, lithium, sodium, potassium, rubidium, cesium, and francium.

GS chemical elements  
. **alkali metals**  
. cesium  
. . cesium isotopes  
. . . cesium 133  
. . . cesium 134  
. . . cesium 137  
. . . cesium 144  
. cesium vapor  
. francium  
. lithium  
. . liquid lithium  
. . lithium isotopes  
. . potassium  
. . liquid potassium  
. . potassium isotopes  
. . . potassium 38  
. . . potassium 39  
. . . potassium 40  
. rubidium  
. . rubidium isotopes  
. . . rubidium 86  
. sodium  
. . liquid sodium  
. . sodium isotopes  
. . . sodium 22  
. . . sodium 24  
. . sodium vapor  
metals  
. **alkali metals**  
. cesium  
. . cesium isotopes

- ... cesium 133
  - ... cesium 134
  - ... cesium 137
  - ... cesium 144
  - .. cesium vapor
  - .. francium
  - .. lithium
  - .. liquid lithium
  - .. lithium isotopes
  - .. potassium
  - .. liquid potassium
  - .. potassium isotopes
  - ... potassium 38
  - ... potassium 39
  - ... potassium 40
  - .. rubidium
  - .. rubidium isotopes
  - ... rubidium 86
  - .. sodium
  - .. liquid sodium
  - .. sodium isotopes
  - ... sodium 22
  - ... sodium 24
  - ... sodium vapor
  - RT cesium alloys
  - metal vapors
- alkali vapor lamps**
- DEF Lamps in which light is produced by an electric discharge between electrodes in an alkali vapor at low or high pressures.
  - GS lighting equipment
    - . luminaires
    - . flash lamps
    - . . . **alkali vapor lamps**
  - RT lasers
  - luminescence
  - metal vapors
  - rare earth elements
- alkalies**
- UF *caustics*
  - GS bases (chemical)
    - . **alkalies**
    - . lithium hydroxides
    - . potassium hydroxides
    - . sodium hydroxides
  - RT alkalinity
  - carbonates
  - hydroxides
- alkaline batteries**
- GS electric generators
    - . direct power generators
    - . primary batteries
    - . . . **alkaline batteries**
  - electrochemical cells
  - . electric batteries
  - . primary batteries
  - . . . **alkaline batteries**
  - RT storage batteries
  - thermal batteries
- $\infty$  **alkaline earth compounds**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - UF *Group 2A compounds*
  - RT alkaline earth metals
  - alkaline earth oxides
  - barium compounds
  - beryllium compounds
  - calcium compounds
  - $\infty$  chemical compounds
  - magnesium compounds
  - strontium compounds
  - strontium oxides
- alkaline earth metals**
- GS chemical elements
    - . **alkaline earth metals**
    - . barium isotopes
    - metals
    - . **alkaline earth metals**
    - . barium isotopes
  - RT  $\infty$  alkaline earth compounds
- alkaline earth oxides**
- GS chalcogenides
  - . oxides
  - . metal oxides
- ... **alkaline earth oxides**
  - ... barium oxides
  - ... beryllium oxides
  - ... alexandrite
  - ... calcium oxides
  - ... akermanite
  - ... magnesium oxides
  - ... akermanite
  - ... periclase
  - RT  $\infty$  alkaline earth compounds
- alkalinity**
- DEF The state of being alkaline.
  - RT alkalies
  - bases (chemical)
  - chemical analysis
  - chemical composition
  - pH
  - salinity
  - soil sampling
  - water pollution
  - water quality
- alkaloids**
- GS bases (chemical)
    - . **alkaloids**
    - . atropine
    - . betaines
    - . caffeine
    - . colchicine
    - . ergotamine
    - . hyoscyne
    - . lysergine
    - . morphine
    - . nicotinamide
    - . nicotine
    - . pilocarpine
    - . reserpine
    - . strychnine
    - . tropanyl compounds
  - nitrogen compounds
    - . **alkaloids**
    - . atropine
    - . betaines
    - . caffeine
    - . colchicine
    - . ergotamine
    - . hyoscyne
    - . lysergine
    - . morphine
    - . nicotinamide
    - . nicotine
    - . pilocarpine
    - . reserpine
    - . strychnine
    - . tropanyl compounds
  - organic compounds
    - . cyclic compounds
    - . heterocyclic compounds
  - . . . **alkaloids**
  - ... atropine
  - ... betaines
  - ... caffeine
  - ... colchicine
  - ... ergotamine
  - ... hyoscyne
  - ... lysergine
  - ... morphine
  - ... nicotinamide
  - ... nicotine
  - ... pilocarpine
  - ... reserpine
  - ... strychnine
  - ... tropanyl compounds
  - organic compounds
  - . cyclic compounds
  - . heterocyclic compounds
  - . . . **alkaloids**
  - ... atropine
  - ... betaines
  - ... caffeine
  - ... colchicine
  - ... ergotamine
  - ... hyoscyne
  - ... lysergine
  - ... morphine
  - ... nicotinamide
  - ... nicotine
  - ... pilocarpine
  - ... reserpine
  - ... strychnine
  - ... tropanyl compounds
  - RT curare
  - drugs
  - marijuana
  - quinoline
- alkalosis**
- RT acidosis
  - hyperventilation
  - pH
  - pH factor
  - toxicity
- alkanes**
- UF *saturated hydrocarbons*
  - GS organic compounds
  - . hydrocarbons
- .. aliphatic hydrocarbons
  - ... **alkanes**
  - ... butanes
  - ... cetane
  - ... ethane
  - ... heptanes
  - ... methane
  - ... nitropropane
  - ... nonanes
  - ... octanes
  - ... paraffins
  - ... ceresin
  - ... pentanes
  - ... neopentane
  - ... propane
  - RT hydrocarbon fuels
  - waxes
- alkenes**
- UF *olefins*
  - GS organic compounds
  - . hydrocarbons
  - . aliphatic hydrocarbons
  - . . . **alkenes**
  - ... butenes
  - ... ethylene
  - ... vinylidene
  - ... hexenes
  - ... propylene
  - ... trienes
  - RT alkynes
  - oxetane polymers
  - terpenes
- alkoxides**
- (added January 1995)
  - UF *alcoholates*
  - GS chalcogenides
  - . oxides
  - . . **alkoxides**
  - RT alcohols
  - organometallic compounds
  - sol-gel processes
- alkyd resins**
- GS resins
  - . **alkyd resins**
  - RT adhesives
  - protective coatings
- alkyl compounds**
- GS **alkyl compounds**
  - . alkylidene
  - . cetyl compounds
  - . dibutyl compounds
  - . hexyl compounds
  - . isopropyl nitrate
  - . methyl nitrate
  - . propyl nitrate
  - . tetrabutyls
  - . triethyl compounds
  - . trimethyl compounds
  - RT  $\infty$  chemical compounds
  - organic compounds
- alkylates**
- GS esters
  - . **alkylates**
  - RT alkylation
- alkylation**
- UF *oxyalkylation*
  - GS chemical reactions
  - . **alkylation**
  - RT alkylates
  - Friedel-Craft reaction
  - methylation
  - refining
- alkylferrocene**
- GS iron compounds
  - . ferrocenes
  - . . **alkylferrocene**
  - organometallic compounds
  - . ferrocenes
  - . . **alkylferrocene**
- alkylidene**
- GS alkyl compounds

# alkynes

## . alkylidene

## alkynes

- GS organic compounds
  - . hydrocarbons
  - . . . aliphatic hydrocarbons
  - . . . . **alkynes**
  - . . . . . acetylene
  - . . . . . oxyacetylene
- RT alkenes
  - cyclic AMP
  - cyclic hydrocarbons

## all sky photography

- GS imagery
  - . photography
  - . . **all sky photography**
- RT black and white photography
  - cloud photographs
  - cloud photography
  - wide angle lenses

## Allegheny Plateau (US)

- GS land
  - . **Allegheny Plateau (US)**
  - landforms
  - . terraces (landforms)
  - . . plateaus
  - . . . **Allegheny Plateau (US)**
- RT Maryland
  - Pennsylvania
  - Virginia
  - West Virginia

## Allende meteorite

- GS celestial bodies
  - . meteorites
  - . . stony meteorites
  - . . . carbonaceous meteorites
  - . . . . carbonaceous chondrites
  - . . . . . **Allende meteorite**
  - . . . . . chondrites
  - . . . . . carbonaceous chondrites
  - . . . . . **Allende meteorite**

## allergic diseases

- RT anaphylaxis
  - contact dermatitis
  - immunology

## allocations

- UF *assignment*
- GS **allocations**
  - . resource allocation
- RT allowances
  - budgeting
  - commercial energy
  - cost effectiveness
  - distributing
  - ∞ distribution
    - domestic energy
    - economic analysis
    - economic factors
    - engineering management
    - estimates
    - federal budgets
    - financial management
    - industrial energy
    - matrix management
    - procurement management
    - project planning
    - research management
    - revenue
    - transportation energy

## allotropy

- RT austenite
  - crystal structure
  - polymorphism

## allowances

- RT allocations
  - clearances
- ∞ compensation
  - precision
  - productivity
  - regulations
  - reliability
  - sampling

tolerances (mechanics)

## alloxan

- GS organic compounds
  - . cyclic compounds
  - . . heterocyclic compounds
  - . . . pyrimidines
  - . . . . **alloxan**
- RT thymidine
  - thymine
  - uracil
  - uric acid

## alloying

- RT additives
  - alloys
  - aluminum-lithium alloys
  - bimetals
  - binary alloys
  - eutectic alloys
  - eutectics
  - intermetallics
  - ∞ metallurgy
    - mischmetal
    - powder metallurgy
    - pyrometallurgy
    - quaternary alloys
    - solid solutions
    - ternary alloys

## alloys

DEF Substances having metallic properties and being composed of two or more chemical elements of which at least one is an elemental metal.

- GS **alloys**
  - . antimony alloys
  - . . babbitt metal
  - . . arsenic alloys
  - . . barium alloys
  - . . bearing alloys
  - . . binary alloys
  - . . bismuth alloys
  - . . boron alloys
  - . . cadmium alloys
  - . . cast alloys
  - . . cesium alloys
  - . . chromium alloys
  - . . Astroloy (trademark)
  - . . chromium steels
  - . . Rene 41
  - . . Rene 63
  - . . Rene 77
  - . . Rene 95
  - . . cobalt alloys
  - . . Astroloy (trademark)
  - . . Rene 41
  - . . Rene 63
  - . . Rene 77
  - . . Rene 95
  - . . constantan
  - . . copper alloys
  - . . babbitt metal
  - . . brasses
  - . . bronzes
  - . . Manganin (trademark)
  - . . eutectic alloys
  - . . gallium alloys
  - . . germanium alloys
  - . . gold alloys
  - . . hafnium alloys
  - . . heat resistant alloys
  - . . nimonic alloys
  - . . refractory metal alloys
  - . . . molybdenum alloys
  - . . . . Rene 41
  - . . . . Rene 63
  - . . . . Rene 77
  - . . . . Rene 95
  - . . . niobium alloys
  - . . . osmium alloys
  - . . . rhenium alloys
  - . . . tantalum alloys
  - . . . tungsten alloys
  - . . Udimet alloys
  - . . Waspaloy
    - . high strength alloys
  - . . Astroloy (trademark)
  - . . high strength steels
  - . . . maraging steels

- . indium alloys
- . iridium alloys
- . iron alloys
- . . steels
- . . . bainitic steel
- . . . carbon steels
- . . . . low carbon steels
- . . . chromium steels
- . . . Croloy
- . . . high strength steels
- . . . maraging steels
- . . . nickel steels
- . . . stainless steels
- . . . . austenitic stainless steels
- . . . . ferritic stainless steels
- . . . . martensitic stainless steels
- . . Kovar (trademark)
- . . lead alloys
- . . light alloys
- . . aluminum alloys
- . . . aluminum-lithium alloys
- . . beryllium alloys
- . . magnesium alloys
- . . liquid alloys
- . . lithium alloys
- . . aluminum-lithium alloys
- . . manganese alloys
- . . Manganin (trademark)
- . . mercury alloys
- . . mercury amalgams
- . . monotectic alloys
- . . mulberry (alloy)
- . . nickel alloys
- . . Astroloy (trademark)
- . . Hastelloy (trademark)
- . . Inconel (trademark)
- . . kamacite
- . . Monel (trademark)
- . . Nichrome (trademark)
- . . nitinol alloys
- . . Rene 41
- . . Rene 63
- . . Rene 77
- . . Rene 95
- . . Udimet alloys
- . . Waspaloy
- . . palladium alloys
- . . Permalloys (trademark)
- . . platinum alloys
- . . plutonium alloys
- . . potassium alloys
- . . quaternary alloys
- . . rare earth alloys
- . . erbium alloys
- . . gadolinium alloys
- . . lanthanum alloys
- . . mischmetal
- . . neodymium alloys
- . . rhodium alloys
- . . ruthenium alloys
- . . selenium alloys
- . . shape memory alloys
- . . nitinol alloys
- . . silicon alloys
- . . silver alloys
- . . sodium alloys
- . . solders
- . . syntectic alloys
- . . tellurium alloys
- . . ternary alloys
- . . Astroloy (trademark)
- . . thallium alloys
- . . thorium alloys
- . . tin alloys
- . . babbitt metal
- . . titanium alloys
- . . nitinol alloys
- . . uranium alloys
- . . vanadium alloys
- . . wrought alloys
- . . yttrium alloys
- . . zinc alloys
- . . zirconium alloys
- . . Zircalloys (trademark)
- . . . Zircaloy 2 (trademark)

RT

- alloying
- bimetals
- binary systems (materials)
- dispersion strengthening

- embedded atom method
- eutectic composites
- eutectics
- ferrous metals
- hardeners
- heat treatment
- intermetallics
- Kondo effect
- Laves phases
- liquid phases
- metallography
- metalloids
- ∞ metallurgy
- metals
- mixtures
- oxide dispersion strengthening
- phase diagrams
- powder metallurgy
- precipitates
- rheocasting
- solid solutions
- stress relieving
- ternary systems

**alluvium**

- DEF Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedimentation.
- GS soils
  - . **alluvium**
- RT clays
  - deltas
  - fans (landforms)
  - floods
  - gravels
  - hydrology
  - mud
  - rivers
  - sands
  - sedimentary rocks
  - sediments
  - streams
  - water flow

**all-weather air navigation**

- GS navigation
  - . air navigation
  - . . **all-weather air navigation**
- RT Doppler navigation
  - inertial navigation
  - navigation aids
  - radar navigation
  - radio navigation
  - solar compasses
  - Tacan

**all-weather landing systems**

- GS landing aids
  - . instrument landing systems
  - . . **all-weather landing systems**
- RT aircraft landing
  - aircraft safety
  - flight safety
  - low visibility
- ∞ systems

**allyl compounds**

- RT ∞ chemical compounds
- diallyl compounds

*almucantar*

- USE **elevation angle**

**Aloha system**

- DEF A multiple random access communications scheme in which there is a nonfixed allocation of channel capacity, so that the channel is available to any terminal whenever it has a packet ready for transmission.

- GS networks
  - . communication networks
  - . . **Aloha system**
  - telecommunication
  - . multiple access
  - . . **Aloha system**
  - . packet transmission
  - . . **Aloha system**
  - transmission
  - . signal transmission
  - . . data transmission

- . . . multiple access
- . . . . **Aloha system**
- . . . packet transmission
- . . . . **Aloha system**
- RT channel capacity
- channel noise
- code division multiple access
- computer networks
- frequency division multiple access
- packets (communication)
- random access
- satellite transmission
- ∞ systems
- time division multiple access
- transmission efficiency
- VSAT (network)

**Alouette 1 satellite**

- UF *S-27 satellite*
- GS artificial satellites
  - . Alouette satellites
  - . . **Alouette 1 satellite**
  - Canadian spacecraft
  - . Alouette satellites
  - . . **Alouette 1 satellite**
- RT ionospheric sounding

**Alouette 2 satellite**

- GS artificial satellites
  - . Alouette satellites
  - . . **Alouette 2 satellite**
  - . ISIS satellites
  - . . **Alouette 2 satellite**
  - Canadian spacecraft
  - . Alouette satellites
  - . . **Alouette 2 satellite**
- RT ionospheric sounding

*Alouette 3 helicopter*

- USE **SE-3160 helicopter**

**Alouette B satellite**

- GS artificial satellites
  - . Alouette satellites
  - . . **Alouette B satellite**
  - Canadian spacecraft
  - . Alouette satellites
  - . . **Alouette B satellite**
- RT ISIS-X

**Alouette helicopters**

- GS Sud Aviation aircraft
  - . **Alouette helicopters**
  - . . SA-330 helicopter
  - . . SE-3160 helicopter
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . **Alouette helicopters**
  - . . . . SA-330 helicopter
  - . . . . SE-3160 helicopter
- RT ∞ aircraft

**Alouette project**

- GS programs
  - . projects
  - . . **Alouette project**
  - . space programs
  - . . Canadian space program
  - . . . **Alouette project**
- RT cosmic noise
  - data acquisition
  - ionospheric sounding
  - ISIS-A

**Alouette satellites**

- GS artificial satellites
  - . **Alouette satellites**
  - . . Alouette 1 satellite
  - . . Alouette 2 satellite
  - . . Alouette B satellite
  - Canadian spacecraft
  - . **Alouette satellites**
  - . . Alouette 1 satellite
  - . . Alouette 2 satellite
  - . . Alouette B satellite
- RT ISIS satellites

**alpha decay**

- DEF The radioactive transformation of a nu-

- clide by alpha-particle emission.
- GS decay
  - . radioactive decay
  - . . **alpha decay**
  - nuclear reactions
  - . radioactive decay
  - . . **alpha decay**
- RT fine structure
  - selection rules (nuclear physics)

**Alpha jet aircraft**

- GS attack aircraft
  - . fighter aircraft
  - . . **Alpha jet aircraft**
  - jet aircraft
  - . **Alpha jet aircraft**
  - training aircraft
  - . **Alpha jet aircraft**
- RT ∞ aircraft
  - ∞ military aircraft

**Alpha Magnetic Spectrometer**

- (added June 1998)
- UF *AMS (spectrometer)*
- GS measuring instruments
  - . spectrometers
  - . . **Alpha Magnetic Spectrometer**
- RT antimatter
  - Cerenkov counters
  - cosmic rays
  - dark matter
  - International Space Station
  - interstellar matter
  - magnetic spectroscopy
  - space station payloads
  - spaceborne astronomy

**alpha particles**

- SN (EMITTED BY NUCLEI)
- DEF Positively charged particles emitted from the nuclei of certain atoms during radioactive disintegration. Used for alpha radiation.
- UF *alpha radiation*
- GS ionizing radiation
  - . **alpha particles**
  - particles
  - . charged particles
  - . . energetic particles
  - . . . nuclei (nuclear physics)
  - . . . . **alpha particles**
  - . corpuscular radiation
  - . . energetic particles
  - . . . nuclei (nuclear physics)
  - . . . . **alpha particles**
  - . elementary particles
  - . . bosons
  - . . . **alpha particles**
  - . nuclear particles
  - . . bosons
  - . . . **alpha particles**
- RT alphas
  - alphatrons
  - corpuscular radiation
  - cosmic rays
  - deuteron irradiation
  - deuterons
  - flux density
  - helium
  - helium ions
  - ions
  - nuclear radiation
  - nucleons
  - protons
  - ∞ radiation
  - radioactivity
  - solar wind velocity
  - tritons

**alpha plasma devices**

- GS plasma accelerators
  - . **alpha plasma devices**
- RT ∞ devices
  - Hall accelerators
  - magnetohydrodynamics
  - plasma physics
  - plasmas (physics)

*alpha radiation*

- USE **alpha particles**

**alphabets**

- RT abbreviations



## alphanumeric characters

alphanumeric characters  
coding  
languages  
symbols

### alphanumeric characters

DEF Characters in a set that contain both letters and digits, but they usually also contain other characters such as punctuation symbols.

GS symbols  
. alphanumeric characters  
. . . digits  
. . . . binary digits  
RT alphabets  
instruction sets (computers)  
light emitting diodes  
∞ numbers

### alphatrons

GS measuring instruments  
. pressure gages  
. . . vacuum gages  
. . . . ionization gages  
. . . . **alphatrons**  
vacuum apparatus  
. vacuum gages  
. . . ionization gages  
. . . **alphatrons**  
RT alpha particles

### Alpine meteorology

DEF Wind, precipitation, atmospheric physics, and other climatological phenomena peculiar to the Alps and/or other similar mountainous areas.

GS meteorology  
. **Alpine meteorology**  
RT aeronomy  
clouds (meteorology)  
nephelanalysis  
precipitation (meteorology)  
storms (meteorology)  
weather  
wind (meteorology)

### Alps Mountains (Europe)

GS landforms  
. mountains  
. . **Alps Mountains (Europe)**  
RT Austria  
Europe  
Italy  
Switzerland  
West Germany

### ALS (launch system)

USE **Advanced Launch System (STS)**

### ALSEP

USE **Apollo Lunar Surface Experiments Package**

### Altair engine

USE **X-248 engine**

### Altair Lunar Lander

(added November 2008)

DEF The lunar landing module of the Constellation program. The lander is capable of landing four astronauts on the moon, providing life support and a base for weeklong initial surface exploration missions, and returning the crew to the Orion spacecraft that will return them to Earth.

GS lunar spacecraft  
. lunar landing modules  
. . **Altair Lunar Lander**  
manned spacecraft  
. **Altair Lunar Lander**  
modules  
. spacecraft modules  
. . . landing modules  
. . . . lunar landing modules  
. . . . **Altair Lunar Lander**  
soft landing spacecraft  
. landing modules  
. . lunar landing modules  
. . . **Altair Lunar Lander**  
spacecraft components  
. spacecraft modules

. . landing modules  
. . . lunar landing modules  
. . . . **Altair Lunar Lander**  
RT Ares 5 cargo launch vehicle  
Constellation program  
lunar bases  
lunar exploration  
lunar landing  
lunar logistics

### alteration

USE **revisions**

### alternating current

UF **AC (current)**  
GS electric current  
. **alternating current**  
electricity  
. **alternating current**  
RT current converters (AC to DC)  
direct current  
induction motors  
inverted converters (DC to AC)  
voltage converters (AC to AC)

### alternating current generators

USE **AC generators**

### alternating direction implicit methods

UF **ADI methods**  
GS problem solving  
. **alternating direction implicit methods**  
RT differential equations  
numerical analysis  
partial differential equations

### alternations

GS variations  
. periodic variations  
. . **alternations**  
RT cycles  
intervals  
rhythm (biology)

### alternatives

RT options  
substitutes  
variations

### alternators (generators)

USE **AC generators**

### altimeters

DEF Instruments for measuring height above a reference datum.  
GS measuring instruments  
. distance measuring equipment  
. . **altimeters**  
. . . laser altimeters  
. . . . radio altimeters  
RT aircraft instruments  
altimetry  
altitude  
approach indicators  
astrolabes  
barometers  
flight instruments  
hypsonometers  
landing instruments  
navigation aids  
navigation instruments  
position indicators  
range finders  
rate of climb indicators  
satellite altimetry

### altimetry

GS **altimetry**  
. satellite altimetry  
RT altimeters  
altitude  
elevation  
geodesy  
geoids  
radar measurement  
topography

### altitude

DEF In astronomy, angular displacement

above the horizon. Also height, especially radial distance as measured above a given datum, as average sea level.

GS **altitude**  
. flight altitude  
. high altitude  
. low altitude  
. midaltitude  
. sea level  
RT altimeters  
altimetry  
apexes  
azimuth  
distance  
elevation  
elevation angle  
height  
position (location)

### altitude acclimatization

DEF A physiological adaptation to reduced atmospheric and oxygen pressure.

GS adaptation  
. acclimatization  
. . **altitude acclimatization**  
RT mountain inhabitants

### altitude control

RT ∞ control  
laser altimeters  
lateral control  
longitudinal control  
spacing

### altitude sickness

DEF In general, any sickness brought on by exposure to reduced oxygen tension and barometric pressure.

GS sicknesses  
. **altitude sickness**  
RT aeroembolism  
aerosinusitis  
aerospace medicine  
decompression sickness

### altitude simulation

UF **simulated altitude**  
GS simulation  
. environment simulation  
. . **altitude simulation**  
RT computerized simulation  
flight simulation  
high altitude environments  
hypobaric atmospheres  
landing simulation  
space environment simulation  
thermal simulation  
training devices  
vacuum chambers

### altitude tests

GS **altitude tests**  
. high altitude tests  
RT engine tests  
flight tests  
full scale tests  
high altitude environments  
test vehicles  
∞ tests

### altitude tolerance

GS tolerances (physiology)  
. **altitude tolerance**  
RT high altitude breathing  
high altitude environments  
high altitude pressure  
hypobaric atmospheres  
low pressure

### ALU (computer components)

USE **arithmetic and logic units**

### alum

GS aluminum compounds  
. **alum**  
potassium compounds  
. **alum**  
sulfur compounds  
. sulfates

- . . **alum**
- alumina*
- USE **aluminum oxides**
- aluminates**
  - GS aluminum compounds
  - . **aluminates**
  - RT aluminum oxides
  - ∞ oxygen compounds
  - spinel
- aluminides**
  - DEF Intermetallic compounds of aluminum and a transition metal.
  - GS aluminum compounds
  - . **aluminides**
  - . . iron aluminides
  - . . nickel aluminides
  - . . titanium aluminides
  - RT aluminum alloys
  - aluminum coatings
  - heat resistant alloys
  - intermetallics
  - nickel alloys
  - protective coatings
  - titanium alloys
- aluminizing*
- USE **aluminum coatings**
- aluminum**
  - GS chemical elements
  - . **aluminum**
  - . . aluminum isotopes
  - . . . aluminum 26
  - . . . aluminum 27
  - metals
  - . **aluminum**
  - . . aluminum isotopes
  - . . . aluminum 26
  - . . . aluminum 27
  - RT aluminum alloys
  - Boral
  - Borsic (tradename)
  - cryolite
  - dawsonite
  - powdered aluminum
  - reaction bonding
  - sialon
  - sintered aluminum powder
- aluminum 26**
  - GS chemical elements
  - . aluminum
  - . . aluminum isotopes
  - . . . **aluminum 26**
  - . nuclides
  - . . isotopes
  - . . . aluminum isotopes
  - . . . . **aluminum 26**
  - metals
  - . aluminum
  - . . aluminum isotopes
  - . . . **aluminum 26**
- aluminum 27**
  - GS chemical elements
  - . aluminum
  - . . aluminum isotopes
  - . . . **aluminum 27**
  - . nuclides
  - . . isotopes
  - . . . aluminum isotopes
  - . . . . **aluminum 27**
  - metals
  - . aluminum
  - . . aluminum isotopes
  - . . . **aluminum 27**
- aluminum alloys**
  - GS alloys
  - . light alloys
  - . . **aluminum alloys**
  - . . . aluminum-lithium alloys
  - RT aluminides
  - aluminum
  - bearing alloys
  - friction stir welding
  - gallium alloys
- indium alloys
- iron aluminides
- lamella (metallurgy)
- lithium alloys
- mischmetal
- silicon alloys
- vanadium alloys
- aluminum antimonides**
  - GS aluminum compounds
  - . **aluminum antimonides**
  - antimony compounds
  - . antimonides
  - . . **aluminum antimonides**
- aluminum arsenides**
  - DEF Binary compounds of aluminum with negative, trivalent arsenic.
  - GS aluminum compounds
  - . **aluminum arsenides**
  - . . aluminum gallium arsenides
  - . . indium aluminum arsenides
  - arsenic compounds
  - . arsenides
  - . . **aluminum arsenides**
  - . . . aluminum gallium arsenides
  - . . . indium aluminum arsenides
  - RT semiconductors (materials)
- aluminum borohydrides**
  - GS aluminum compounds
  - . aluminum hydrides
  - . . **aluminum borohydrides**
  - boron compounds
  - . borohydrides
  - . . **aluminum borohydrides**
  - . boron hydrides
  - . . **aluminum borohydrides**
  - hydrogen compounds
  - . hydrides
  - . . borohydrides
  - . . . **aluminum borohydrides**
  - . boron hydrides
  - . . . **aluminum borohydrides**
  - . metal hydrides
  - . . . aluminum hydrides
  - . . . . **aluminum borohydrides**
- aluminum boron composites**
  - DEF Structural materials composed of aluminum alloys reinforced with boron fibers (filaments).
  - GS composite materials
  - . boron reinforced materials
  - . . **aluminum boron composites**
  - . metal matrix composites
  - . . **aluminum boron composites**
  - RT boron fibers
  - fiber composites
- aluminum carbides**
  - GS aluminum compounds
  - . **aluminum carbides**
  - carbon compounds
  - . carbides
  - . . **aluminum carbides**
- aluminum chlorides**
  - GS aluminum compounds
  - . **aluminum chlorides**
  - halogen compounds
  - . chlorine compounds
  - . . chlorides
  - . . . **aluminum chlorides**
  - . halides
  - . . chlorides
  - . . . **aluminum chlorides**
  - . metal halides
  - . . . **aluminum chlorides**
- aluminum coatings**
  - UF *aluminizing*
  - GS coatings
  - . metal coatings
  - . . **aluminum coatings**
  - RT aluminides
- aluminum compounds**
  - GS **aluminum compounds**
  - . alum
- . aluminates
- . aluminides
- . . iron aluminides
- . . nickel aluminides
- . . titanium aluminides
- . aluminum antimonides
- . aluminum arsenides
- . . aluminum gallium arsenides
- . . indium aluminum arsenides
- . aluminum carbides
- . aluminum chlorides
- . aluminum fluorides
- . aluminum hydrides
- . . aluminum borohydrides
- . aluminum nitrides
- . aluminum oxides
- . . alexandrite
- . . sapphire
- . aluminum perchlorates
- . aluminum silicates
- . . andesite
- . . feldspars
- . . gehlenite
- . . kaolinite
- . . montmorillonite
- . . pyrophyllite
- . . . plagioclase
- . beryl
- . . alexandrite
- . cordierite
- . cryolite
- . lithium aluminum hydrides
- . muscovite
- . nepheline
- . nephelite
- . organic aluminum compounds
- . spodumene
- . tourmaline
- RT ∞ chemical compounds
- ∞ Group 3A compounds
- ∞ metal compounds
- metal fuels
- metal propellants
- aluminum fluorides**
  - GS aluminum compounds
  - . **aluminum fluorides**
  - halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . metal fluorides
  - . . . . **aluminum fluorides**
  - . halides
  - . . fluorides
  - . . . metal fluorides
  - . . . . **aluminum fluorides**
  - . metal halides
  - . . . metal fluorides
  - . . . . **aluminum fluorides**
- aluminum gallium arsenide lasers**  
(added November 1991)
  - GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . semiconductor lasers
  - . . . . **aluminum gallium arsenide lasers**
  - . . solid state lasers
  - . . . **aluminum gallium arsenide lasers**
  - stimulated emission devices
  - . lasers
  - . . semiconductor lasers
  - . . . **aluminum gallium arsenide lasers**
  - . . solid state lasers
  - . . . **aluminum gallium arsenide lasers**
  - RT gallium arsenide lasers
  - injection lasers
  - waveguide lasers
- aluminum gallium arsenides**
  - DEF Compounds exhibiting characteristics suitable for use in laser devices, light-emitting diodes, solar cells, etc. Used for AlGaAs.
  - UF AlGaAs
  - GS aluminum compounds
  - . aluminum arsenides

## aluminum graphite composites

. . . **aluminum gallium arsenides**  
arsenic compounds  
. arsenides  
. . . aluminum arsenides  
. . . **aluminum gallium arsenides**  
. . . gallium arsenides  
. . . **aluminum gallium arsenides**  
gallium compounds  
. gallium arsenides  
. . . **aluminum gallium arsenides**  
RT MODFETS  
negative resistance devices

### aluminum graphite composites

DEF Structural materials composed of aluminum alloys reinforced with graphite.  
GS composite materials  
. metal matrix composites  
. . . **aluminum graphite composites**  
RT fiber composites  
graphite

### aluminum hydrides

GS aluminum compounds  
. **aluminum hydrides**  
. . . aluminum borohydrides  
hydrogen compounds  
. hydrides  
. . . metal hydrides  
. . . **aluminum hydrides**  
. . . . aluminum borohydrides

### aluminum isotopes

GS chemical elements  
. aluminum  
. . . **aluminum isotopes**  
. . . . aluminum 26  
. . . . aluminum 27  
. nuclides  
. . . isotopes  
. . . . **aluminum isotopes**  
. . . . . aluminum 26  
. . . . . aluminum 27  
metals  
. aluminum  
. . . **aluminum isotopes**  
. . . . aluminum 26  
. . . . . aluminum 27

### aluminum nitrides

GS aluminum compounds  
. **aluminum nitrides**  
nitrogen compounds  
. nitrides  
. . . metal nitrides  
. . . **aluminum nitrides**

### aluminum oxides

UF *alumina*  
*corundum*  
GS aluminum compounds  
. **aluminum oxides**  
. . . alexandrite  
. . . sapphire  
chalcogenides  
. oxides  
. . . metal oxides  
. . . . **aluminum oxides**  
. . . . . alexandrite  
. . . . . sapphire  
RT abrasives  
aluminates  
bauxite  
energy absorption films  
gehlenite  
kaolinite  
nanocomposites  
plagioclase  
pyrophyllite  
ruby  
thermites

### aluminum perchlorates

GS aluminum compounds  
. **aluminum perchlorates**  
halogen compounds  
. chlorine compounds  
. . . perchlorates

. . . **aluminum perchlorates**

### aluminum silicates

GS aluminum compounds  
. **aluminum silicates**  
. . . andesite  
. . . feldspars  
. . . gehlenite  
. . . kaolinite  
. . . montmorillonite  
. . . pyrophyllite  
. . . plagioclase  
silicon compounds  
. silicates  
. . . **aluminum silicates**  
. . . . andesite  
. . . . feldspars  
. . . . gehlenite  
. . . . kaolinite  
. . . . montmorillonite  
. . . . pyrophyllite  
. . . . . plagioclase  
RT minerals  
mullites

### aluminum-lithium alloys

(added August 1991)  
DEF Light alloys consisting primarily of aluminum and lithium.  
GS alloys  
. light alloys  
. . . aluminum alloys  
. . . . **aluminum-lithium alloys**  
. . . . lithium alloys  
. . . . **aluminum-lithium alloys**  
RT aircraft construction materials  
airframe materials  
alloying  
copper alloys  
high strength alloys  
magnesium alloys

### alveolar air

DEF The respiratory air in the alveoli (air sacs) deep within the lungs.  
GS gases  
. gas mixtures  
. . . air  
. . . . **alveolar air**  
mixtures  
. solutions  
. . . gas mixtures  
. . . . air  
. . . . . **alveolar air**  
RT exhalation  
expired air  
lungs

### alveoli

DEF The terminal air sacs deep within the lungs.  
GS anatomy  
. respiratory system  
. . . lungs  
. . . . **alveoli**  
RT lung morphology  
pulmonary circulation  
pulmonary functions  
respiration

### AM (modulation)

USE **amplitude modulation**

### AM-1 (EOS) spacecraft

(added June 1999)  
USE **Terra spacecraft**

### amalgams

USE **mercury amalgams**

### Amalthea

DEF Innermost satellite of Jupiter.  
GS celestial bodies  
. natural satellites  
. . . Jupiter satellites  
. . . . **Amalthea**  
RT Jupiter (planet)

solar system

### Amazon region (South America)

GS regions  
. tropical regions  
. . . **Amazon region (South America)**  
RT Brazil  
forests  
river basins  
rivers

### Amberlite (trademark)

RT asbestos  
thermal insulation

### ambience

RT acoustic measurement  
environmental monitoring  
environments  
noise (sound)  
pollution monitoring

### ambient temperature

DEF Temperature of surrounding medium.  
Used for environmental temperature.  
UF *environmental temperature*  
GS temperature  
. **ambient temperature**  
RT atmospheric temperature  
operating temperature  
room temperature  
satellite temperature

### ambiguity

RT intelligibility  
positioning

### ambipolar diffusion

GS diffusion  
. **ambipolar diffusion**  
RT electron diffusion  
electron mobility  
ionic diffusion  
ionic mobility  
plasma diffusion

### ambit

USE **field theory (physics)**

### ambulances

RT medical services  
∞ military vehicles  
safety devices

### American Indians

RT anthropology  
culture (social sciences)  
ethnic factors  
minorities  
races (anthropology)

### americium

GS chemical elements  
. actinide series  
. . . transuranium elements  
. . . . **americium**  
. . . . . americium isotopes  
. . . . . . americium 241  
. . . . . nuclides  
. . . . . isotopes  
. . . . . radioactive isotopes  
. . . . . transuranium elements  
. . . . . **americium**  
. . . . . . americium isotopes  
. . . . . . . americium 241  
metals  
. actinide series  
. . . transuranium elements  
. . . . **americium**  
. . . . . americium isotopes  
. . . . . . americium 241

### americium 241

GS chemical elements  
. actinide series  
. . . transuranium elements  
. . . . americium  
. . . . . americium isotopes  
. . . . . . **americium 241**  
. . . . . nuclides  
. . . . . isotopes

- . . . radioactive isotopes
- . . . . transuranium elements
- . . . . . americium
- . . . . . americium isotopes
- . . . . . **americium 241**
- metals
- . actinide series
- . . transuranium elements
- . . . americium
- . . . . americium isotopes
- . . . . . **americium 241**
- americium isotopes**
- GS chemical elements
- . actinide series
- . . transuranium elements
- . . . americium
- . . . . **americium isotopes**
- . . . . . americium 241
- . nuclides
- . . isotopes
- . . . radioactive isotopes
- . . . . transuranium elements
- . . . . . americium
- . . . . . **americium isotopes**
- . . . . . . americium 241
- metals
- . actinide series
- . . transuranium elements
- . . . americium
- . . . . **americium isotopes**
- . . . . . americium 241
- amidase**
- GS biopolymers
- . proteins
- . . enzymes
- . . . **amidase**
- organic compounds
- . proteins
- . . enzymes
- . . . **amidase**
- RT amino acids
- amides**
- GS nitrogen compounds
- . **amides**
- . . acetanilide
- . . acetazolamide
- . . carbamides
- . . cyanamides
- . . formhydroxamic acid
- . . nicotinamide
- . . oxamic acids
- . . polyimides
- . . . bismaleimide
- . . . Kapton (trademark)
- . . succinimides
- . . ureas
- . . . difluorourea
- . . . thioureas
- . . . thiuronium
- RT imides
- phthalimides
- amines**
- GS organic compounds
- . **amines**
- . . aminophylline
- . . amphetamines
- . . . methamphetamine
- . . aniline
- . . catecholamine
- . . . epinephrine
- . . . norepinephrine
- . . cysteamine
- . . diamines
- . . . ethylenediamine
- . . . guanidines
- . . . . guanethidine
- . . . . triaminoguanidinium azide
- . . difluorourea
- . . dimenhydrinate
- . . dimethylhydrazines
- . . diphenyl hydantoin
- . . ergotamine
- . . fluoroamines
- . . . nitrofluoroamines
- . . . trifluoroamine oxide
- . . gallamine triethiodide

- . . hexamethylenetetramine
- . . histidine
- . . hydroxylamine sulfate
- . . . hyoscine
- . . . mecamylamine
- . . . melamine
- . . . methylene diamine
- . . . monoethanolamine (MEA)
- . . . nitroamines
- . . . nitrosamine
- . . . promethazine
- . . . tetrafluorohydrazine
- . . . tetryl
- . . thiuronium
- . . trinitramine
- . . . tryptamines
- . . . . melatonin
- . . . . serotonin
- . . . . acetylcholine
- RT ∞ aliphatic compounds
- histamines
- hydrazines
- hydrocarbon fuels
- imines
- Lewis base
- nitrosyls
- phenolic epoxy resins
- rhodamine
- amino acids**
- GS acids
- . **amino acids**
- . . alanine
- . . . phenylalanine
- . . . aspartic acid
- . . . cysteine
- . . . dopa
- . . . folic acid
- . . . glutamic acid
- . . . glutamine
- . . . glycine
- . . . hippuric acid
- . . . histidine
- . . . leucine
- . . . . norleucine
- . . . . lysine
- . . . . melanoidin
- . . . . methionine
- . . . . thyroxine
- . . . . tryptophan
- . . . . tyrosine
- organic compounds
- . **amino acids**
- . . alanine
- . . . phenylalanine
- . . . aspartic acid
- . . . cysteine
- . . . dopa
- . . . folic acid
- . . . glutamic acid
- . . . glutamine
- . . . glycine
- . . . hippuric acid
- . . . histidine
- . . . leucine
- . . . . norleucine
- . . . . lysine
- . . . . melanoidin
- . . . . methionine
- . . . . thyroxine
- . . . . tryptophan
- . . . . tyrosine
- RT adenosine triphosphate
- adrenocorticotropin (ACTH)
- amidase
- aspartates
- cyclic AMP
- cysteamine
- lipids
- peptides
- polypeptides
- protoproteins
- synthetic food
- uridylic acid
- zwitterions
- amino radical**
- GS hydrogen compounds
- . hydrides

- . . nitrogen hydrides
- . . . **amino radical**
- nitrogen compounds
- . nitrogen hydrides
- . . **amino radical**
- radicals
- . **amino radical**
- RT ammonia
- anions
- free radicals
- molecular ions
- reaction kinetics
- aminophylline**
- GS diuretics
- . **aminophylline**
- drugs
- . **aminophylline**
- organic compounds
- . amines
- . . **aminophylline**
- RT stimulants
- ammeters**
- DEF An instrument for measuring the magnitude of an electric current.
- GS measuring instruments
- . **ammeters**
- . . micromillimeters
- . . . thermoelement ammeters
- RT coulometers
- electric current
- electrical measurement
- galvanometers
- voltmeters
- ammines**
- RT ammonia
- ∞ chemical compounds
- copper
- intermetallics
- ∞ metal compounds
- ammonia**
- GS gases
- . **ammonia**
- . . liquid ammonia
- inorganic compounds
- . **ammonia**
- . . liquid ammonia
- nitrogen compounds
- . **ammonia**
- . . liquid ammonia
- RT absorption cooling
- amino radical
- ammines
- ammonium compounds
- ammonolysis
- atmospheric energy sources
- cultivation
- fertilizers
- Kjeldahl method
- nitrogen hydrides
- refrigerants
- ammonium bromides**
- GS ammonium compounds
- . **ammonium bromides**
- halogen compounds
- . bromine compounds
- . . bromides
- . . . **ammonium bromides**
- . . halides
- . . bromides
- . . . **ammonium bromides**
- ammonium chlorides**
- GS ammonium compounds
- . **ammonium chlorides**
- halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **ammonium chlorides**
- . . halides
- . . chlorides
- . . . **ammonium chlorides**
- ammonium compounds**
- GS **ammonium compounds**
- . ammonium bromides

## ammonium nitrates

- . ammonium chlorides
- . ammonium nitrates
- . ammonium perchlorates
- . ammonium phosphates
- . ammonium picrates
- . ammonium sulfates
- . hydroxylammonium perchlorates
- RT ammonia
- ∞ chemical compounds
- hexamethonium

## ammonium nitrates

- GS ammonium compounds
- . **ammonium nitrates**
- nitrogen compounds
- . nitrates
- . . inorganic nitrates
- . . . **ammonium nitrates**
- RT cultivation
- fertilizers

## ammonium perchlorates

- GS ammonium compounds
- . **ammonium perchlorates**
- halogen compounds
- . chlorine compounds
- . . perchlorates
- . . . **ammonium perchlorates**
- RT solid rocket propellants

## ammonium phosphates

- GS ammonium compounds
- . **ammonium phosphates**
- phosphorus compounds
- . phosphates
- . . **ammonium phosphates**

## ammonium picrates

- GS ammonium compounds
- . **ammonium picrates**
- nitrogen compounds
- . nitro compounds
- . . picrates
- . . . **ammonium picrates**
- RT explosives

## ammonium sulfates

- GS ammonium compounds
- . **ammonium sulfates**
- sulfur compounds
- . sulfates
- . . **ammonium sulfates**

## ammonolysis

- GS chemical reactions
- . **ammonolysis**
- decomposition
- . **ammonolysis**
- RT ammonia
- cracking (chemical engineering)
- hydrolysis

## ammunition

- GS **ammunition**
- . incendiary ammunition
- RT blanks
- bombs (ordnance)
- case bonded propellants
- explosive devices
- explosives
- fuses (ordnance)
- grenades
- guns (ordnance)
- igniters
- magazines (supply chambers)
- mines (ordnance)
- missiles
- ordnance
- projectiles
- propellants
- pyrotechnics
- ∞ rockets
- shaped charges
- ∞ shot
- torpedoes
- ∞ tracers
- warheads

weapons

## amobarbital

- GS acids
- . **amobarbital**
- RT central nervous system depressants

## amoeba

- GS animals
- . protozoa
- . . **amoeba**
- . . . pelomyxa
- microorganisms
- . protozoa
- . . **amoeba**
- . . . pelomyxa
- RT parasitic diseases

## AMOOS

- USE **Aeromaneuvering Orbit to Orbit Shuttle**

## Amor asteroid

- DEF One group of Earth-approaching asteroids with orbits between the planets Mars and Jupiter. Used for Minor Planet 1221.
- UF *Minor Planet 1221*
- GS celestial bodies
- . asteroids
- . . **Amor asteroid**
- RT asteroid belts
- astronomy
- Jupiter (planet)
- Mars (planet)
- planetary orbits
- solar system

## amorphous materials

- GS **amorphous materials**
- . amorphous silicon
- RT asphalt
- carbon nitrides
- crystallinity
- glass
- graphoepitaxy
- grout
- ∞ materials
- spin glass

## amorphous semiconductors

- GS semiconductors (materials)
- . **amorphous semiconductors**
- . . amorphous silicon
- RT semiconducting films

## amorphous silicon

- GS amorphous materials
- . **amorphous silicon**
- chemical elements
- . metalloids
- . . silicon
- . . . **amorphous silicon**
- semiconductors (materials)
- . amorphous semiconductors
- . . **amorphous silicon**
- RT diamond films
- photovoltaic cells
- semiconducting films
- silicon films
- silicon junctions
- solar cells
- thin films

## amount

- UF *quantity*
- RT addition
- sums
- value

## AMP (biochemistry)

- (added December 2004)
- USE **adenosine monophosphate**

## amperage

- USE **electric current**

## amphetamines

- GS organic compounds
- . amines
- . . **amphetamines**
- . . . methamphetamine

RT central nervous system stimulants

## amphibia

- GS animals
- . vertebrates
- . . **amphibia**
- . . . frogs
- RT poikilothermia

## amphibious aircraft

- GS amphibious vehicles
- . **amphibious aircraft**
- RT ∞ aircraft
- seaplanes
- water takeoff and landing aircraft

## amphibious vehicles

- GS **amphibious vehicles**
- . amphibious aircraft
- RT boats
- ∞ military vehicles
- seaplanes
- ships
- surface vehicles
- ∞ vehicles
- water vehicles

## amphiboles

- DEF A group of dark, rock-forming, ferromagnesian silicate minerals closely related in crystal form and composition.
- GS minerals
- . **amphiboles**
- RT calcium silicates
- silicates

## Amphitrite asteroid

- GS celestial bodies
- . asteroids
- . . **Amphitrite asteroid**
- RT asteroid belts
- Galileo project

## amplidynes

- GS electric generators
- . rotating generators
- . . **amplidynes**
- RT amplifiers
- electric motors
- power amplifiers
- servomotors

## amplification

- UF *amplification factor*
- gain (amplification)*
- intensification*
- GS **amplification**
- . antenna gain
- . high gain
- . power gain
- . sound amplification
- . wave amplification
- RT amplifiers
- amplitudes
- dynamic characteristics
- dynamic range
- dynamic response
- fluid amplifiers
- fluidics
- magnification
- positive feedback
- sensitivity
- stability
- transfer functions
- transient response

## amplification factor

- USE **amplification**

## amplifier design

- RT amplifiers
- computer aided design
- ∞ design
- logic design
- operational amplifiers
- product development
- traveling wave amplifiers

## amplifiers

- DEF Devices which enable an input signal

to control a source of power whose output is an enlarged reproduction of the essential characteristics of the signal. Used for electronic amplifiers.

- UF *electronic amplifiers*
- GS **amplifiers**
  - . beam plasma amplifiers
  - . broadband amplifiers
  - . carcinotrons
  - . current amplifiers
  - . . . photomultiplier tubes
  - . . . frequency modulation photomultipliers
  - . differential amplifiers
  - . distributed amplifiers
  - . feedback amplifiers
  - . fluid amplifiers
  - . . jet amplifiers
  - . intermediate frequency amplifiers
  - . light amplifiers
  - . limiter amplifiers
  - . linear amplifiers
  - . magnetic amplifiers
  - . magnetostatic amplifiers
  - . microwave amplifiers
  - . . . crossed field amplifiers
  - . . . cyclotron resonance devices
  - . . . planotrons
  - . cascode devices
  - . operational amplifiers
  - . parametric amplifiers
  - . postamplifiers
  - . power amplifiers
  - . preamplifiers
  - . push-pull amplifiers
  - . quantum amplifiers
  - . servoamplifiers
  - . transistor amplifiers
  - . traveling wave amplifiers
  - . voltage amplifiers

- RT **amplidyne**
  - amplification
  - amplifier design
- ∞ boosters
- capacitors
- circuits
- dynamic range
- ∞ electric cells
- electric choppers
- image intensifiers
- intensifiers
- klystrons
- laser cavities
- lasers
- linear circuits
- masers
- modulators
- multivibrators
- oscillators
- receivers
- repeaters
- solid state devices
- stimulated emission devices
- transformers
- traveling wave masers

*amplitrons (trademark)*

USE **planotrons**

**amplitude distribution analysis**

- UF *amplitude probability analysis*
- GS statistical analysis
  - . **amplitude distribution analysis**
- RT photopeak
  - pulse amplitude
  - signal to noise ratios
  - signatures

**amplitude modulation**

DEF In general, modulation in which the amplitude of a wave is the characteristic subject to variation.

- UF *AM (modulation)*
- GS coding
  - . signal encoding
  - . . **amplitude modulation**
  - . . . quadrature amplitude modulation modulation
  - . **amplitude modulation**
  - . . quadrature amplitude modulation

- RT Bragg cells
  - demodulation
  - demodulators
  - frequency modulation
  - light modulation
  - modulators
  - P.A.C.M. telemetry
  - phase modulation
  - pulse modulation
  - single sideband transmission

*amplitude probability analysis*

USE **amplitude distribution analysis**

**amplitudes**

DEF The maximum value of the displacement of a wave or other periodic phenomenon from a reference position. Also, angular distance north or south of the prime vertical; the arc of the horizon, or the angle at the zenith between the prime vertical and a vertical circle, measured north or south from the prime vertical to the vertical circle.

- GS **amplitudes**
  - . pulse amplitude
  - . scattering amplitude
- RT amplification
  - cycles
  - dimensions
  - displacement
  - frequencies
  - ∞ intensity
    - level (quantity)
    - magnitude
    - oscillations
    - phase deviation
    - picosecond pulses
    - pulses
    - standing wave ratios
    - vibration

**ampoules**

DEF Glass containers designed to be filled and sealed by fusion of the glass neck.

- RT ∞ containers
  - laboratory equipment
  - vacuum systems

**AMPS (satellite payload)**

- UF *Atmospheric and Magnetospheric Payload*
  - plasmas-in-space payload*
- GS measuring instruments
  - . satellite-borne instruments
  - . . **AMPS (satellite payload)**
  - payloads
    - . Spacelab payloads
    - . . **AMPS (satellite payload)**
- RT instrument packages

**AMPTE (satellites)**

- SN (ACTIVE MAGNETOSPHERIC PARTICLE TRACER EXPLORERS)
- UF *Active Magneto Particle Tracer Explorers*
- GS artificial satellites
  - . scientific satellites
  - . . **AMPTE (satellites)**
- RT Earth magnetosphere
  - European space programs
  - satellite-borne instruments
  - solar wind
  - space plasmas
  - spaceborne experiments

*AMS (spectrometer)*

(added June 1998)  
USE **Alpha Magnetic Spectrometer**

*AMSU (radiometer)*

(added July 1997)  
USE **Advanced Microwave Sounding Unit**

AMTV

USE **automated mixed traffic vehicles**

**AN-2 aircraft**

- GS Antonov aircraft
  - . **AN-2 aircraft**
  - biplanes

- . **AN-2 aircraft**
  - transport aircraft
  - . **AN-2 aircraft**
- RT agricultural aircraft
- ∞ aircraft

**AN-22 aircraft**

- UF *Antheus aircraft*
  - Antonov AN-22 aircraft*
  - Cock aircraft*
- GS Antonov aircraft
  - . **AN-22 aircraft**
  - jet aircraft
    - . turboprop aircraft
    - . . **AN-22 aircraft**
    - monoplanes
      - . **AN-22 aircraft**
      - transport aircraft
        - . **AN-22 aircraft**
  - RT ∞ aircraft
    - passenger aircraft

**AN-24 aircraft**

- UF *Antonov AN-24 aircraft*
  - Coke aircraft*
- GS Antonov aircraft
  - . **AN-24 aircraft**
  - jet aircraft
    - . turboprop aircraft
    - . . **AN-24 aircraft**
    - monoplanes
      - . **AN-24 aircraft**
      - transport aircraft
        - . **AN-24 aircraft**
  - RT ∞ aircraft
    - passenger aircraft

**anabaena**

- GS plants (botany)
  - . algae
    - . . blue green algae
    - . . . **anabaena**
    - . . . thermophilic plants
    - . . blue green algae
    - . . . **anabaena**

**anaerobes**

- RT aerobes
  - bacteria
  - microorganisms
  - sewage treatment

**analgesia**

- RT anesthesia
  - drugs
  - pain

**analog circuits**

- GS circuits
  - . **analog circuits**
- RT data converters
  - operational amplifiers
  - rheoelectrical simulation

**analog computers**

DEF Computers that work on the principle of measuring, as distinguished from counting, in which the input data is analogous to a measurement continuum such as linear lengths, voltages, or resistances which can be manipulated by the computer.

- GS data processing equipment
  - . computers
  - . . **analog computers**
  - . . . EAI 680 computer
  - . . . Honeywell 600/6000 computer
  - . . . SIGMA 5 computer
  - . . . Univac 1100 series computers
  - . . . . Univac 1105 computer
  - . . . . Univac 1106 computer
  - . . . . Univac 1107 computer
  - . . . . Univac 1108 computer
  - . . . . Univac 1110 computer
- RT differential amplifiers
  - differential analyzers
  - digital computers
  - discriminators
  - functional integration
  - hybrid computers
  - missile control

## analog data

- operational amplifiers
- resolvers
- signal analyzers
- spectral resolution

### analog data

- RT binary data
- ∞ data
  - data converters
  - data processing
  - digital data
- ∞ measurement
  - video compression
  - video data

### analog simulation

- GS models
  - mathematical models
  - analog simulation**
- simulation
  - computerized simulation
  - analog simulation**
- RT computer systems simulation
- digital simulation
- flight simulation
- rheoelectrical simulation
- systems simulation

### analog to digital converters

DEF Devices for converting non-digital information into digits. Used for digitizers.

- UF *digitizers*
- GS data converters
  - analog to digital converters**
- RT coders
- coding
- ∞ converters
  - data acquisition
  - digital computers
  - digital electronics
  - digital systems
  - digital to analog converters
  - Illiac 3 computer
  - Illiac 4 computer
  - peripheral equipment (computers)
  - plotting

### analogies

- UF *similarities*
- GS **analogies**
  - Earth analogs
  - hydraulic analogies
- RT comparison
- homology
- simulation

### analogous

- RT models
- simulators

### analysis

USE **analyzing**

### analysis (mathematics)

DEF That part of the field of mathematics which arises from the calculus and which deals primarily with functions.

- GS **analysis (mathematics)**
  - aperiodic functions
  - calculus
    - continuity (mathematics)
    - differential calculus
    - Fourier-Bessel transformations
    - Graeff calculus
    - integral calculus
    - limits (mathematics)
    - series (mathematics)
    - asymptotic series
    - Campbell-Hausdorff series
    - cosine series
    - Fourier series
    - Pade approximation
    - power series
    - Taylor series
    - MacLaurin series
    - progressions
    - Prony series
    - sine series
    - vector analysis
    - collinearity

- coplanarity
- curl (vectors)
- vorticity
- combinatorial analysis
- binomial coefficients
- combinations (mathematics)
- factorials
- partitions (mathematics)
- permutations
- complex variables
- Airy function
- analytic functions
  - entire functions
  - Bessel functions
  - Hankel functions
  - Cauchy integral formula
  - conformal mapping
  - conjugates
  - conjugate points
  - exponential functions
  - logarithms
  - gamma function
  - harmonic functions
  - hyperbolic functions
  - hypergeometric functions
  - Laguerre functions
  - Legendre functions
  - Liouville theorem
  - Mathieu function
  - meromorphic functions
  - elliptic functions
  - rational functions
  - nonholonomic equations
  - orthogonal functions
  - Walsh function
  - Schwarz-Christoffel transformation
  - singularity (mathematics)
  - naked singularities
  - spherical harmonics
  - dependent variables
  - Fourier analysis
  - Fourier series
  - function space
  - Banach space
  - Hilbert space
  - Sobolev space
  - functional analysis
  - Banach space
  - Hilbert space
  - Sobolev space
  - convolution integrals
  - harmonic analysis
  - tesseral harmonics
  - zonal harmonics
  - integral equations
  - Fredholm equations
  - J integral
  - singular integral equations
  - Volterra equations
  - Wiener Hopf equations
  - integral transformations
  - Fourier transformation
  - fast Fourier transformations
  - Fourier-Bessel transformations
  - Hilbert transformation
  - Laplace transformation
  - half planes
  - half spaces
  - Hill determinant
  - numerical analysis
  - approximation
  - Born approximation
  - Born-Oppenheimer approximation
  - Chebyshev approximation
  - Eddington approximation
  - essentially non-oscillatory schemes
  - finite difference theory
  - finite difference time domain method
  - finite element method
  - Hartree approximation
  - least squares method
  - mean square values
  - Milne method
  - multigrad methods
  - Newton methods
  - Newton-Raphson method
  - boundary element method

- discretization (mathematics)
- numerical differentiation
- Oseen approximation
- Pade approximation
- particle in cell technique
- Pohlhausen method
- predictor-corrector methods
- Rayleigh-Ritz method
- relaxation method (mathematics)
- Reynolds averaging
- Ritz averaging method
- Schwartz method
- Sommerfeld approximation
- TVD schemes
- upwind schemes (mathematics)
- vortex in cell technique
- Trefftz method
- computational mechanics
- meshfree methods
- boundary integral method
- computational astrophysics
- computational chemistry
- computational electromagnetics
- computational fluid dynamics
- difference equations
- error analysis
- finite volume method
- Godunov method
- flux difference splitting
- flux vector splitting
- Glimm method
- Graeff calculus
- interpolation
- iteration
- conjugate gradient method
- iterative solution
- Newton methods
- Newton-Raphson method
- predictor-corrector methods
- Monte Carlo method
- nomographs
- numerical integration
- Runge-Kutta method
- computational aeroacoustics
- direct numerical simulation
- space-time CE/SE method
- truncation errors
- Pfaff equation
- phase-space integral
- real variables
- Abel function
- asymptotes
- Bessel functions
- Hankel functions
- Bethe-Salpeter equation
- calculus of variations
- composite functions
- delta function
- differential equations
- Blasius equation
- Chandrasekhar equation
- cosine series
- Duffing differential equation
- Falkner-Skan equation
- hyperbolic differential equations
- Lame wave equations
- partial differential equations
- biharmonic equations
- Burger equation
- Cauchy-Riemann equations
- elliptic differential equations
- Monge-Ampere equation
- Euler-Cauchy equations
- Fowcs Williams-Hawkings equation
- Fokker-Planck equation
- Gauss equation
- Helmholtz vorticity equation
- Liouville equations
- parabolic differential equations
- Poisson equation
- vlasov equations
- Riccati equation
- vorticity equations
- Helmholtz vorticity equation
- Einstein equations
- existence theorems
- extremum values
- limits (mathematics)

- . . . maxima
- . . . minima
- . . . . Cramer-Rao bounds
- . . . Fourier-Bessel transformations
- . . . Green's functions
- . . . hyperbolic functions
- . . . hyperplanes
- . . . Jacobi integral
- . . . Jacobi matrix method
- . . . kernel functions
- . . . Liapunov functions
- . . . linear equations
- . . . . Flowcs Williams-Hawking's equation
- . . . . linear evolution equations
- . . . . Riccati equation
- . . . Lipschitz condition
- . . . measure and integration
- . . . . binary integration
- . . . . Borel sets
- . . . . functional integration
- . . . . integral calculus
- . . . . J integral
- . . . . Lebesgue theorem
- . . . . numerical integration
- . . . . . Runge-Kutta method
- . . . . Stieltjes integral
- . . . . weighting functions
- . . . Neumann problem
- . . . nonlinear equations
- . . . . cubic equations
- . . . . Duffing differential equation
- . . . . Monge-Ampere equation
- . . . . nonlinear evolution equations
- . . . . quadratic equations
- . . . . quartic equations
- . . . . numerical differentiation
- . . . . periodic functions
- . . . . trigonometric functions
- . . . . . cosine series
- . . . . . sine series
- . . . . . tangents
- . . . . series (mathematics)
- . . . . asymptotic series
- . . . . Campbell-Hausdorff series
- . . . . cosine series
- . . . . Fourier series
- . . . . Pade approximation
- . . . . power series
- . . . . . Taylor series
- . . . . . MacLaurin series
- . . . . progressions
- . . . . Prony series
- . . . . sine series
- . . . Sturm-Liouville theory
- . . . vector analysis
- . . . . collinearity
- . . . . coplanarity
- . . . . curl (vectors)
- . . . . vorticity
- . . . Weierstrass functions
- . . . Whittaker functions
- . . . frequency domain analysis
- . . . time domain analysis
- . . . finite difference time domain method
- RT algebra
- ∞ analyzing
- ∞ applications of mathematics
- discontinuity
- equilibrium equations
- geometry
- ∞ mathematics
- monotone functions
- ∞ space
- trees (mathematics)
- vector spaces
- Venn diagrams

**analysis of variance**

DEF A systematic statistical procedure for determining the sources and the magnitudes of the errors present in a measurement process, and for assessing the significance of differences between materials, processes, or test methods under study.

- GS statistical analysis
- . variance (statistics)
- . . **analysis of variance**

RT ∞ variance

**analytic functions**

- UF *holomorphism*
- GS analysis (mathematics)
- . complex variables
- . . **analytic functions**
- . . . entire functions
- . . . functions (mathematics)
- . . **analytic functions**
- . . . entire functions
- RT Cauchy-Riemann equations
- isoperimetric problem
- nonholonomic equations
- power series

**analytic geometry**

- GS geometry
- . Euclidean geometry
- . . **analytic geometry**
- . . . catenaries
- . . . circumferences
- . . . conics
- . . . . ellipses
- . . . . hyperbolas
- . . . . parabolas
- . . . . cycloids
- . . . . epicycloids
- . . . . loci
- . . . Mercator projection
- . . . . quadrants
- . . . . S curves
- . . . . Gompertz curves
- . . . . spheroids
- . . . . . oblate spheroids
- . . . . . prolate spheroids
- . . . . tangents
- . . . . toruses
- . . . . trigonometry
- RT annuli
- asymptotes
- calculus
- coordinates
- curves (geometry)
- ∞ cylinders
- descriptive geometry
- differential geometry
- polytopes
- projective geometry

**analytical chemistry**

- RT chemical analysis
- ∞ chemistry
- inorganic chemistry
- qualitative analysis
- quantitative analysis
- volumetric analysis

**analyzers**

- SN (EXCLUDES DEVICES FOR PERFORMING MATHEMATICAL ANALYSIS)
- GS measuring instruments
- . **analyzers**
- . . engine analyzers
- . . signal analyzers
- RT controllers
- ∞ detectors
- monitors
- selectors
- ∞ test equipment

∞ **analyzing**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *analysis*
- instrumental analysis*
- RT activation analysis
- algebra
- analysis (mathematics)
- chemical analysis
- combinatorial analysis
- cost analysis
- creep analysis
- design analysis
- diagnosis
- differential geometry
- duality principle
- error analysis
- evaluation

- examination
- failure analysis
- figure of merit
- forecasting
- management analysis
- multivariate statistical analysis
- network analysis
- numerical analysis
- photointerpretation
- postflight analysis
- prediction analysis techniques
- preflight analysis
- reliability analysis
- sensitivity analysis
- signal analysis
- signature analysis
- spectrum analysis
- statistical analysis
- stress analysis
- structural analysis
- systems analysis
- terrain analysis
- thermal analysis
- training analysis
- trajectory analysis
- trend analysis
- weight analysis
- x ray analysis

**anaphylaxis**

- GS sensitivity
- . **anaphylaxis**
- RT allergic diseases
- antigens
- immunology
- sensitizing

**anastigmatism**

- RT optometry
- vision

**anatase**

- UF *octahedrite*
- GS chalcogenides
- . oxides
- . . metal oxides
- . . . titanium oxides
- . . . . **anatase**
- minerals
- . **anatase**
- titanium compounds
- . titanium oxides
- . . **anatase**
- RT pigments
- rutile

**anatomy**

- SN (LIMITED TO ANIMAL ANATOMY)
- GS **anatomy**
- . abdomen
- . chest
- . . breast
- . . . mammary glands
- . . circulatory system
- . . cardiovascular system
- . . . blood vessels
- . . . . arteries
- . . . . . aorta
- . . . . . arterioles
- . . . . capillaries (anatomy)
- . . . . . glomerulus
- . . . . veins
- . . . heart
- . . . . cardiac auricles
- . . . . cardiac ventricles
- . . . . epicardium
- . . . . heart conduction system
- . . . . myocardium
- . . digestive system
- . . . esophagus
- . . gastrointestinal system
- . . . appendix (anatomy)
- . . . . intestines
- . . . . . rectum
- . . . . stomach
- . . . . mouth
- . . . . lips (anatomy)
- . . pancreas
- . . salivary glands
- . . teeth



## anchors (fasteners)

- . . tongue
- . face (anatomy)
- . . chin
- . . forehead
- . . mouth
- . . . lips (anatomy)
- . . nose (anatomy)
- . genitourinary system
- . . bladder
- . . kidneys
- . . . glomerulus
- . . reproductive systems
- . . . sex glands
- . . . . gonads
- . . . . . ovaries
- . . . . . testes
- . . . prostate gland
- . . . uterus
- . glands (anatomy)
- . . endocrine glands
- . . . adrenal gland
- . . . gonads
- . . . . ovaries
- . . . . . testes
- . . . hypothalamus
- . . . pancreas
- . . . parathyroid gland
- . . . pineal gland
- . . . pituitary gland
- . . . thymus gland
- . . . thyroid gland
- . . mammary glands
- . . salivary glands
- . . sebaceous glands
- . . sex glands
- . . . gonads
- . . . . ovaries
- . . . . . testes
- . . . prostate gland
- . head (anatomy)
- . . skull
- . . . cranium
- . . . . intracranial cavity
- . . . mastoids
- . human body
- . limbs (anatomy)
- . . arm (anatomy)
- . . . elbow (anatomy)
- . . . forearm
- . . hand (anatomy)
- . . . fingers
- . . leg (anatomy)
- . . . feet (anatomy)
- . . . knee (anatomy)
- . . . thigh
- . liver
- . lumbar region
- . musculoskeletal system
- . . bones
- . . . femur
- . . . pelvis
- . . . scapula
- . . . skull
- . . . . cranium
- . . . . . intracranial cavity
- . . . . . mastoids
- . . . spine
- . . . . vertebrae
- . . . sternum
- . . . tibia
- . . . ulna
- . . joints (anatomy)
- . . . elbow (anatomy)
- . . . knee (anatomy)
- . . . wrist
- . . muscles
- . . . constrictors
- . . . diaphragm (anatomy)
- . . . flexors
- . . . myocardium
- . . . skeletal muscle
- . . . smooth muscle
- . . . tendons
- . . cartilage
- . neck (anatomy)
- . nervous system
- . . afferent nervous systems
- . . autonomic nervous system
- . . . sympathetic nervous system

- . . central nervous system
- . . . brain
- . . . . brain stem
- . . . . cerebellum
- . . . . cerebral ventricles
- . . . . cerebrum
- . . . . . cerebral cortex
- . . . . . occipital lobes
- . . . . diencephalon
- . . . . . hypothalamus
- . . . . . pineal gland
- . . . . thalamus
- . . . hippocampus
- . . . spinal cord
- . . efferent nervous systems
- . . nerves
- . . ganglia
- . . myelin sheath
- . . nerve fibers
- . . oculomotor nerves
- . . peripheral nervous system
- . peritoneum
- . pleurae
- . respiratory system
- . . bronchi
- . . diaphragm (anatomy)
- . . larynx
- . . . glottis
- . . . vocal cords
- . . lungs
- . . . alveoli
- . . nose (anatomy)
- . . paranasal sinuses
- . . pharynx
- . . trachea
- . sciatic region
- . sense organs
- . . chemoreceptors
- . . ear
- . . . eardrums
- . . . eustachian tubes
- . . . labyrinth
- . . . . cochlea
- . . . . . Corti organ
- . . . . . otolith organs
- . . . . . semicircular canals
- . . . . vestibules
- . . . middle ear
- . . eye (anatomy)
- . . choroid membranes
- . . conjunctiva
- . . cornea
- . . oculomotor nerves
- . . . pupils
- . . . retina
- . . . . fovea
- . . gravireceptors
- . . . otolith organs
- . . baroreceptors
- . . mechanoreceptors
- . . photoreceptors
- . . proprioceptors
- . . thermoreceptors
- . skin (anatomy)
- . . epidermis
- . . immune systems
- . thorax
- . torso
- . . lymphatic system
- . . . spleen
- . . . thymus gland

RT

- appendages
- bifurcation (biology)
- biodynamics
- ∞ biology
- ∞ cells (biology)
- ∞ differentiation
- differentiation (biology)
- dorsal sections
- epithelium
- exoskeletons
- hepatitis
- morphology
- organs
- posterior sections
- tissues (biology)
- vestibular nystagmus

viscera

## anchors (fasteners)

GS fasteners

- . **anchors (fasteners)**

RT ∞ bands

- bolts
- brackets
- clips
- couplings
- guy wires
- holders
- mooring
- nuts (fasteners)
- screws
- straps
- studs (structural members)
- tetherlines

## Andes Mountains (South America)

GS landforms

- . mountains
- . . **Andes Mountains (South America)**

RT South America

## andesite

DEF Volcanic rock composed essentially of andesine and one or more mafic constituents.

GS aluminum compounds

- . aluminum silicates
- . . **andesite**
- rocks
- . **andesite**
- silicon compounds
- . silicates
- . . aluminum silicates
- . . . **andesite**

RT feldspars

- igneous rocks
- minerals
- soils

## Andorra

GS nations

- . **Andorra**

RT Europe

- France
- Pyrenees Mountains (Europe)
- Spain

## ∞ Andromeda

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT Andromeda Constellation

- Andromeda Galaxy

## Andromeda Constellation

GS constellations

- . **Andromeda Constellation**

RT ∞ Andromeda

- Andromeda Galaxy

## Andromeda Galaxy

GS celestial bodies

- . galaxies
- . . spiral galaxies
- . . . **Andromeda Galaxy**

RT ∞ Andromeda

- Andromeda Constellation
- local group (astronomy)

## anechoic chambers

DEF Enclosures especially designed with boundaries that absorb sufficiently well the sound incident thereon to create an essentially field-free condition in the frequency ranges of interest.

GS compartments

- . test chambers
- . . **anechoic chambers**
- test facilities
- . **anechoic chambers**

RT acoustic attenuation

- acoustic measurement
- acoustics
- ∞ chambers

- zero sound
- anelasticity**  
 GS mechanical properties  
 . elastic properties  
 . . **anelasticity**  
 RT creep properties  
 internal friction  
 modulus of elasticity  
 stress relaxation
- anemias**  
 GS diseases  
 . **anemias**  
 RT blood  
 blood cell count  
 blood cells  
 hematocrit ratio  
 hemoglobin  
 ischemia  
 occupational diseases
- anemometers**  
 DEF Instruments used to measure the speed of air currents, usually measured from the rotation of wind driven cups or from wind pressure through a tube pointed into the wind.  
 GS measuring instruments  
 . **anemometers**  
 . . drag force anemometers  
 . . hot-film anemometers  
 . . hot-wire anemometers  
 . . laser anemometers  
 . . sonic anemometers  
 RT aircraft instruments  
 flow measurement  
 meteorological instruments  
 speed indicators  
 velocity measurement  
 wind (meteorology)  
 wind measurement  
 wind vanes  
 wind velocity  
 wind velocity measurement
- anemometry*  
 USE **velocity measurement**
- anesthesia**  
 GS **anesthesia**  
 . electroanesthesia  
 RT analgesia  
 hypnosis  
 sensory perception  
 unconsciousness
- anesthesiology**  
 GS medical science  
 . **anesthesiology**  
 RT chloroform  
 clinical medicine  
 depressants  
 diagnosis  
 drugs  
 pharmacology
- anesthetics**  
 GS drugs  
 . **anesthetics**  
 . . chloroform  
 . . cyclopropane  
 . . methyl chloride  
 . . novocain  
 RT ethers
- angels (radar)**  
 DEF Echos of false radar targets caused by atmospheric inhomogeneity, atmospheric refraction, insects, birds, or unknown phenomena.  
 GS echoes  
 . radar echoes  
 . . **angels (radar)**  
 RT glint  
 radar cross sections  
 radio echoes
- angina pectoris**  
 GS diseases  
 . heart diseases  
 . . **angina pectoris**
- RT anoxia  
 arteriosclerosis  
 coronary artery disease  
 emotional factors  
 heart function  
 heart rate  
 myocardium  
 physical exercise  
 stress (physiology)
- angiogenesis**  
*(added June 2004)*  
 DEF The development of new blood vessels.  
 UF *neovascularization*  
 RT blood vessels  
 cardiovascular system  
 ∞ development  
 growth  
 hematopoietic system
- angiography**  
 GS imagery  
 . radiography  
 . . **angiography**  
 RT brain  
 cardiology  
 cardiovascular system
- angiosperms**  
 RT grains (food)  
 nuts (fruits)  
 plants (botany)  
 vegetables
- angiotensins**  
*(added August 2004)*  
 DEF Oligopeptides ranging in size from angiotensin precursors with 14 amino acids to the active vasoconstrictor angiotensin II with 8 amino acids, or their analogs or derivatives. The amino acid content varies with the species and changes in that content produce antagonistic or inactive compounds.  
 GS organic compounds  
 . peptides  
 . . polypeptides  
 . . . **angiotensins**  
 RT neurotransmitters  
 renin  
 vasoconstriction  
 vasoconstrictor drugs
- angle of attack**  
 DEF The angle between a reference line fixed with respect to an airframe and a line in the direction of movement of the body.  
 GS geometry  
 . Euclidean geometry  
 . . angles (geometry)  
 . . . **angle of attack**  
 . . . . zero angle of attack  
 RT aerodynamic characteristics  
 aerodynamic stalling  
 ∞ attack  
 boundary layer separation  
 lift  
 sweep angle  
 wing rock
- angles (geometry)**  
 DEF The inclination to each other of two intersecting lines, measured by the arc of a circle intercepted between the two lines forming the angle, the center of the circle being the point of intersection.  
 GS geometry  
 . Euclidean geometry  
 . . **angles (geometry)**  
 . . . angle of attack  
 . . . . zero angle of attack  
 . . . Bragg angle  
 . . . Brewster angle  
 . . . dihedral angle  
 . . . elevation angle  
 . . . look angles (electronics)  
 . . . look angles (tracking)  
 . . . sweep angle  
 . . . . sweepback  
 . . . . . leading edge sweep
- RT angular resolution  
 apsides  
 azimuth  
 complements (mathematics)  
 corners  
 elongation  
 goniometers  
 ∞ grade  
 gradients  
 grazing incidence  
 incidence  
 obliqueness  
 phase shift  
 photogoniometers  
 pitch (inclination)  
 ∞ profiles  
 protractors  
 reciprocal theorems  
 slopes  
 triangulation  
 trigonometry
- Angola**  
 GS nations  
 . **Angola**  
 RT Africa
- angular acceleration**  
 DEF The rate of change of angular velocity.  
 GS rates (per time)  
 . acceleration (physics)  
 . . **angular acceleration**  
 RT ∞ acceleration  
 acceleration measurement  
 centrifugal force  
 centripetal force  
 deceleration  
 rotation  
 spin reduction  
 transverse acceleration  
 yo-yo devices
- angular correlation**  
 GS correlation  
 . **angular correlation**  
 RT data correlation  
 MATTS (systems)  
 view effects
- angular distribution**  
 GS distribution (property)  
 . **angular distribution**  
 RT electron density profiles  
 elementary particle interactions  
 flux density  
 force distribution  
 mass distribution  
 moment distribution  
 nuclear scattering  
 star distribution
- angular momentum**  
 GS momentum  
 . **angular momentum**  
 RT classical mechanics  
 Clebsch-Gordan coefficients  
 electron spin  
 kinetics  
 moments of inertia  
 particle spin  
 quantum numbers  
 quantum theory  
 quenching (atomic physics)  
 Racah coefficient  
 Regge poles  
 spin  
 spin tests  
 stellar rotation  
 transverse momentum  
 Wigner coefficient
- angular motion*  
 USE **angular velocity**
- angular resolution**  
 DEF Specifically, the ability of a radar to distinguish between two targets solely by the measurement of angles.  
 GS resolution  
 . **angular resolution**

## angular velocity

- RT accuracy
- angles (geometry)
- high resolution
- ∞ optics
- radar resolution

### angular velocity

DEF The change of angle per unit time; specifically, in celestial mechanics, the change in angle of the radius vector per unit time. Used for angular motion.

- UF *angular motion*
- GS rates (per time)
  - . **angular velocity**
  - velocity
  - . **angular velocity**
- RT gyration
- orbital velocity
- proper motion
- revolving
- rotation
- rotor speed
- Sagnac effect
- tachometers
- tip speed

### anhydrides

- GS chalcogenides
  - . oxides
  - . . . **anhydrides**
  - . . . peroxides
  - . . . . inorganic peroxides
  - . . . . . hydrogen peroxide
  - . . . . organic peroxides
  - . . . . potassium peroxides
  - . . . . sodium peroxides
- RT acids
- bases (chemical)

### Anik 1

- UF *Anik A*  
*Telesat Canada A*
- GS artificial satellites
  - . synchronous satellites
  - . . Anik satellites
  - . . . **Anik 1**
  - Canadian spacecraft
  - . Anik satellites
  - . . **Anik 1**
- RT Canada
- Canadian space program
- Delta launch vehicle
- international cooperation

### Anik 2

- UF *Anik B*  
*Telesat Canada B*
- GS artificial satellites
  - . synchronous satellites
  - . . Anik satellites
  - . . . **Anik 2**
  - Canadian spacecraft
  - . Anik satellites
  - . . **Anik 2**
- RT Canada
- Canadian space program
- Delta launch vehicle
- international cooperation

### Anik 3

- UF *Anik C*  
*Telesat Canada 3*  
*Telesat Canada C*
- GS artificial satellites
  - . synchronous satellites
  - . . Anik satellites
  - . . . **Anik 3**
  - Canadian spacecraft
  - . Anik satellites
  - . . **Anik 3**
- RT Canada
- Canadian space program

international cooperation

*Anik A*  
USE **Anik 1**

*Anik B*  
USE **Anik 2**

*Anik C*  
USE **Anik 3**

### Anik satellites

DEF A series of geostationary communication satellites operated by Telesat which is partly owned by the Canadian government and partly owned by private enterprise. The name "Anik" is derived from an Eskimo word meaning "brother." It was so designated because of its partial use in the Far North.

- GS artificial satellites
  - . synchronous satellites
  - . . **Anik satellites**
  - . . . Anik 1
  - . . . Anik 2
  - . . . Anik 3
  - Canadian spacecraft
  - . **Anik satellites**
  - . . Anik 1
  - . . Anik 2
  - . . Anik 3

RT Canadian space program  
Delta launch vehicle  
international cooperation

### aniline

- GS organic compounds
  - . amines
  - . . **aniline**
- RT dyes

### animal models

(added July 2008)

DEF Non-human animals, selected because of specific characteristics, for use in experimental research, teaching, or testing.

- GS models
  - . **animal models**
  - . . knockout mice
- RT animals
- bioassay
- bioastronautics
- cytology
- diseases
- in vivo methods and tests
- mice
- pathology
- rats

### animals

- UF *fauna*  
*metazoa*
- GS **animals**
  - . homeotherms
  - . invertebrates
  - . . arthropods
  - . . . artemia
  - . . . crabs
  - . . . insects
  - . . . . bees
  - . . . . bollworms
  - . . . . chironomus flies
  - . . . . cockroaches
  - . . . . Coleoptera
  - . . . . . beetles
  - . . . . . tribolia
  - . . . . . boll weevils
  - . . . . crickets
  - . . . . Drosophila
  - . . . . fireflies
  - . . . . grasshoppers
  - . . . . locusts
  - . . . . moths
  - . . . . . silkworms
  - . . . . spiders
  - . . . mollusks
  - . . . cephalopods
  - . . . . octopuses
  - . . . snails
  - . . Rotifera
  - . . sea urchins

- . . worms
- . . . flatworms
- . . livestock
- . . poikilothermia
- . . protozoa
- . . amoeba
- . . . pelomyxa
- . . Flagellata
- . . . Euglena
- . . . trypanosome
- . . paramecia
- . . vertebrates
- . . . amphibia
- . . . frogs
- . . . birds
- . . . . chickens
- . . . . pigeons
- . . . . turkeys
- . . . . waterfowl
- . . . fishes
- . . . . schools (fish)
- . . . sharks
- . . mammals
- . . . bats
- . . . bears
- . . . cats
- . . . cattle
- . . . . calves
- . . . deer
- . . . . caribous
- . . . goats
- . . . horses
- . . . marine mammals
- . . . . dolphins
- . . . . manatees
- . . . . porpoises
- . . . . seals (animals)
- . . . . whales
- . . . moles
- . . . primates
- . . . . apes
- . . . . chimpanzees
- . . . . baboons
- . . . . human beings
- . . . . monkeys
- . . . rodents
- . . . . guinea pigs
- . . . . hamsters
- . . . . mice
- . . . . . jerboas
- . . . . . knockout mice
- . . . . . pocket mice
- . . . . rabbits
- . . . . rats
- . . . . squirrels
- . . . . . ground squirrels
- . . . dogs
- . . . sheep
- . . . swine
- . . . wolves
- . . reptiles
- . . lizards
- . . snakes
- . . turtles
- . . wildlife
- . . zooplankton

RT animal models

- ∞ biology
- biomass
- carbon cycle
- census
- endangered species
- food chain
- grazing
- habitats
- heterotrophs
- larvae
- microorganisms
- organisms
- parasites
- plankton
- plants (botany)
- predators
- viability
- wildlife radiolocation
- ∞ zoology

### animation

- GS arts

- . graphic arts
- . . . **animation**
- . . . . computer animation
- RT cinematography
- motion pictures
- anions**
- GS ions
- . negative ions
- . . . **anions**
- RT amino radical
- anodes
- cations
- cell anodes
- electrode materials
- electron affinity
- ionic mobility
- anisole**
- GS ethers
- . **anisole**
- organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . **anisole**
- anisoplanatism**
- (added May 1999)
- DEF In adaptive optics (AO) systems, a performance-degrading effect that arises whenever light from the wave-front sensor beacon and light from the target object sample different volumes of optical turbulence. This effect results in an increased value of the aperture-averaged residual phase variance after AO compensation, which causes an exponential decrease in system performance.
- RT aberration
- adaptive optics
- atmospheric correction
- atmospheric optics
- image resolution
- optical correction procedure
- phase error
- telescopes
- anisotropic fluids**
- GS media
- . anisotropic media
- . . **anisotropic fluids**
- RT anisotropy
- ∞ fluids
- invariant imbeddings
- isotropy
- liquid crystals
- Newtonian fluids
- anisotropic media**
- GS media
- . **anisotropic media**
- . . anisotropic fluids
- RT anisotropy
- birefringence
- birefringent coatings
- functionally gradient materials
- homogeneity
- isotropic media
- ∞ materials
- polarization (waves)
- anisotropic plates**
- UF *nonisotropic plates*
- GS structural members
- . plates (structural members)
- . . **anisotropic plates**
- RT cantilever plates
- end plates
- perforated plates
- reinforced plates
- anisotropic shells**
- GS shells (structural forms)
- . **anisotropic shells**
- RT corrugated shells
- elastic shells
- reinforced shells
- anisotropy**
- DEF Having different properties in different directions. Used for nonisotropy, onisotropy, photothermotropism, and thermotropism.
- UF *nonisotropy*
- onisotropy*
- photothermotropism*
- thermotropism*
- GS **anisotropy**
- . plastic anisotropy
- . . elastic anisotropy
- RT aeotropism
- anisotropic fluids
- anisotropic media
- birefringence
- crystal structure
- crystals
- directivity
- isotropy
- mechanical properties
- metallography
- polarization (spin alignment)
- polarization (waves)
- spatial distribution
- Sunyaev-Zeldovich effect
- Anna hurricane**
- GS storms
- . storms (meteorology)
- . . cyclones
- . . . hurricanes
- . . . . **Anna hurricane**
- . . tropical storms
- . . . hurricanes
- . . . . **Anna hurricane**
- ANNA satellites**
- GS artificial satellites
- . geodetic satellites
- . . **ANNA satellites**
- RT Explorer 29 satellite
- Explorer 36 satellite
- GEOS 1 satellite
- GEOS 2 satellite
- GEOS 3 satellite
- annealing**
- DEF Application of heat energy to a material cooling at a suitable rate to relieve stresses, change certain properties, improve machinability, or for realignment of atoms in a distorted lattice as caused, for example, by radiation damage.
- GS heat treatment
- . **annealing**
- . . laser annealing
- . . . pulse heating
- RT combustion synthesis
- graphitization
- hardening (materials)
- heating
- normalizing (heat treatment)
- recrystallization
- simulated annealing
- softening
- stress relieving
- tempering
- annihilation reactions**
- GS **annihilation reactions**
- . positron annihilation
- RT antiparticles
- electron-positron pairs
- high energy interactions
- matter-antimatter propulsion
- photons
- proton-antiproton interactions
- proton-proton reactions
- annotations**
- RT abstracts
- information
- summaries
- annual variations**
- UF *interannual variations*
- seasonal variations*
- GS variations
- . periodic variations
- . . **annual variations**
- RT atmospheric circulation
- brown wave effect
- cycles
- green wave effect
- intraseasonal variations
- Madden-Julian Oscillation
- magnetic variations
- meteorological parameters
- meteorology
- monsoons
- quasi-biennial oscillation
- seasons
- temporal distribution
- weather
- wind variations
- zonal flow (meteorology)
- annular core pulse reactors**
- GS nuclear reactors
- . **annular core pulse reactors**
- RT ∞ nuclear energy
- nuclear fuel elements
- nuclear fuels
- reactor cores
- reactor design
- reactor materials
- reactor physics
- reactor safety
- reactor technology
- ∞ reactors
- annular ducts**
- DEF Ring-shaped openings for the passage of fluids (gases, etc.) designed for optimum aerodynamic flow properties for the application involved.
- GS ducts
- . **annular ducts**
- RT air ducts
- duct geometry
- ducted bodies
- fluid flow
- intake systems
- nose inlets
- openings
- orifices
- vents
- annular flow**
- GS fluid flow
- . axisymmetric flow
- . . **annular flow**
- RT annuli
- axial flow
- channel flow
- coaxial flow
- Couette flow
- ∞ flow
- flow geometry
- heat transmission
- nozzle flow
- one dimensional flow
- turbulent flow
- annular nozzles**
- RT annuli
- coaxial flow
- conical nozzles
- exhaust nozzles
- inlet nozzles
- ∞ nozzles
- plug nozzles
- rocket nozzles
- shrouded nozzles
- spray nozzles
- annular plates**
- GS structural members
- . plates (structural members)
- . . **annular plates**
- RT annuli
- circular plates
- flat plates
- annular suspension and pointing system**
- DEF In the Shuttle era, high accuracy pointing and stabilization of an experiment payload.
- GS pointing control systems
- . **annular suspension and pointing system**
- RT magnetic suspension
- payloads
- space shuttles

## annuli

space transportation system  
Spacelab  
Spacelab payloads  
∞ systems

### annuli

RT analytic geometry  
annular flow  
annular nozzles  
annular plates  
flow measurement  
∞ rings

### anodes

DEF The positive poles or electrodes of electron emitters, such as electron tubes or electric cells.

GS electrodes  
. **anodes**  
. . cell anodes  
. . shell anodes  
. . tube anodes  
RT accumulators  
anions  
cathodes  
electrode materials  
multi-anode microchannel arrays

### anodic coatings

GS coatings  
. inorganic coatings  
. . **anodic coatings**  
. protective coatings  
. . **anodic coatings**  
RT anodizing  
cathodic coatings  
electrode materials  
oxides

### anodic stripping

DEF The removal of metal coatings.

RT cladding  
coating  
debonding (materials)  
delaminating  
metal coatings  
plating  
removal  
∞ stripping

### anodizing

DEF An electrolytic oxidation process in which the surface of a metal, when anodic, is converted to a coating having desirable protective, decorative, or functional properties.

GS coating  
. **anodizing**  
deposition  
. **anodizing**  
RT anodic coatings  
passivity  
protective coatings  
surface treatment

### anolytes

GS conductors  
. electrolytes  
. . **anolytes**  
RT catholytes  
cell anodes

### anomalies

DEF In general, deviations from the norm.

GS **anomalies**  
. geothermal anomalies  
. gravity anomalies  
. magnetic anomalies  
. . geomagnetic hollow  
RT anomalous temperature zones  
Southern Oscillation

### anomalous temperature zones

RT anomalies  
geysers  
stratospheric warming  
temperature measurement  
temperature measuring instruments  
temperature scales

temperature sensors

### anorthosite

DEF A group of essentially monomineralic plutonic igneous rocks composed almost entirely of plagioclase feldspar.

GS rocks  
. igneous rocks  
. . **anorthosite**  
RT feldspars  
gabbro  
soils

### anoxia

DEF A complete lack of oxygen available for physiological use within the body.

RT angina pectoris  
asphyxia  
hypoxia  
stress (physiology)

### ANS

USE **Astronomical Netherlands Satellite**

### Antarctic environment

USE **ice environments**

### Antarctic Ocean

GS oceans  
. **Antarctic Ocean**  
RT Antarctic regions

### Antarctic regions

DEF The areas surrounding and including the continent of Antarctica. Used for Antarctica.

UF *Antarctica*  
GS regions  
. polar regions  
. . **Antarctic regions**  
. . . McMurdo sound  
. . . Ross ice shelf  
. remote regions  
. . **Antarctic regions**  
. . . McMurdo sound  
. . . Ross ice shelf  
Southern Hemisphere  
. **Antarctic regions**  
. . McMurdo sound  
. . Ross ice shelf  
RT Antarctic Ocean  
climatology  
continents  
land ice  
ozone depletion  
polar caps  
polynyas  
Total Ozone Mapping Spectrometer

### Antarctica

USE **Antarctic regions**

### Antares rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . **Antares rocket vehicle**  
. sounding rockets  
. . **Antares rocket vehicle**  
RT atmospheric ionization  
solid propellant rocket engines  
X-254 engine

### Antelope missile

GS missiles  
. **Antelope missile**

### antenna arrays

DEF Systems of antennas coupled together to obtain directional effects, or to increase sensitivity.

GS arrays  
. **antenna arrays**  
. . linear arrays  
. . . endfire arrays  
. . . . Yagi antennas  
. . . multispectral linear arrays  
. . steerable antennas  
. . . inertialless steerable antennas  
. . turnstile antennas  
RT antennas  
beamforming

Cobra Dane (radar)  
dipole antennas  
directional antennas  
log periodic antennas  
microwave antennas  
patch antennas  
phased arrays  
retroreflection  
space based radar  
Very Large Array (VLA)  
Very Long Baseline Array (VLBA)

### antenna components

GS **antenna components**  
. antenna couplers  
. . duplexers  
. . directional couplers  
. antenna feeds  
. parasitic elements (antennas)  
. . directors (antenna elements)  
RT communication equipment  
∞ components  
couplers  
electronic equipment  
∞ spinners

### antenna couplers

GS antenna components  
. **antenna couplers**  
. . duplexers  
. . directional couplers  
couplers  
. **antenna couplers**  
. . duplexers  
. . directional couplers  
RT antennas  
couples  
coupling  
coupling circuits  
energy transfer  
impedance matching  
microwave coupling  
transmission lines

### antenna design

RT antennas  
backlobes  
Cassegrain antennas  
delta antennas  
∞ design  
dipole antennas  
gravitational wave antennas  
Gregorian antennas  
helical antennas  
horn antennas  
lens antennas  
∞ lobes  
log periodic antennas  
maypole antennas  
microstrip antennas  
monopole antennas  
parabolic antennas  
parasitic elements (antennas)  
patch antennas  
pencil beams  
plasma antennas  
product development  
rhombic antennas  
sidelobes  
slot antennas  
space technology experiments  
spiral antennas  
Yagi antennas

### antenna feeds

GS antenna components  
. **antenna feeds**  
RT Gregorian antennas  
reflector antennas  
strip transmission lines  
transmission lines  
waveguides

### antenna fields

USE **antenna radiation patterns**

### antenna gain

(added June 1998)  
GS amplification  
. **antenna gain**

RT antennas  
 automatic gain control  
 directional antennas  
 effectiveness  
 high gain  
 signal reception

**antenna radiation patterns**

UF *antenna fields*

GS distribution (property)  
 . radiation distribution  
 . . **antenna radiation patterns**  
 . . . sidelobes

RT antennas  
 backfire antennas  
 backlobes  
 beam steering  
 beamforming  
 cylindrical antennas  
 directional antennas  
 ∞ fans  
 far fields  
 field theory (physics)  
 footprints  
 Fresnel region  
 Gregorian antennas  
 ∞ lobes  
 near fields  
 parasitic elements (antennas)  
 pencil beams  
 plasma antennas  
 ∞ radiation  
 reflector antennas  
 rosette shapes  
 Schelkunoff principle  
 Sommerfeld approximation  
 support interference  
 synthetic arrays

**antennas**

DEF Conductors or systems of conductors for radiating or receiving radio waves.

GS **antennas**  
 . aircraft antennas  
 . backfire antennas  
 . Cassegrain antennas  
 . cylindrical antennas  
 . delta antennas  
 . directional antennas  
 . . dipole antennas  
 . . helical antennas  
 . . horn antennas  
 . . lens antennas  
 . . log periodic antennas  
 . . loop antennas  
 . . radar antennas  
 . . . radant  
 . . reflector antennas  
 . . . parabolic antennas  
 . . . two reflector antennas  
 . . rhombic antennas  
 . . slot antennas  
 . . steerable antennas  
 . . . inertialess steerable antennas  
 . . Yagi antennas  
 . furlable antennas  
 . gravitational wave antennas  
 . . LIGO (observatory)  
 . . LISA (observatory)  
 . Gregorian antennas  
 . high resolution coverage antennas  
 . hoop column antennas  
 . maypole antennas  
 . microstrip antennas  
 . missile antennas  
 . monopulse antennas  
 . multibeam antennas  
 . multiple beam interval scanners  
 . omnidirectional antennas  
 . . monopole antennas  
 . . . whip antennas  
 . . turnstile antennas  
 . parasitic elements (antennas)  
 . . directors (antenna elements)  
 . plasma antennas  
 . radio antennas  
 . . microwave antennas  
 . . . horn antennas  
 . . . lens antennas

. . . rectennas  
 . . . spacetennas  
 . satellite antennas  
 . Schwarzschild antennas  
 . spacecraft antennas  
 . spherical antennas  
 . spiral antennas  
 . . log spiral antennas  
 . waveguide antennas  
 . . horn antennas  
 . patch antennas

RT antenna arrays  
 antenna couplers  
 antenna design  
 antenna gain  
 antenna radiation patterns  
 arrays  
 conductors  
 corners  
 current sheets  
 electromagnetic radiation  
 folding structures  
 inflatable space structures  
 near fields  
 radiation hardening  
 ∞ radiators  
 radio equipment  
 radio telescopes  
 reflectors  
 slewing  
 space technology experiments  
 telecommunication  
 telescopes  
 towers  
 transmitters

*Antheus aircraft*  
 USE **AN-22 aircraft**

**anthracene**

GS organic compounds  
 . cyclic compounds  
 . . cyclic hydrocarbons  
 . . . **anthracene**  
 . hydrocarbons  
 . . cyclic hydrocarbons  
 . . . **anthracene**

RT anthraquinones  
 phenanthrene

**anthracite**

DEF Coal of the highest metamorphic rank, in which fixed-carbon content is between 92 percent and 98 percent (on a dry, mineral-matter-free basis). It is hard and black, and has a semimetallic luster and semiconchoidal fracture. Anthracite ignites with difficulty and burns with a short blue flame, without smoke. Used for hard coal.

UF *hard coal*

GS fuels  
 . chemical fuels  
 . . hydrocarbon fuels  
 . . . fossil fuels  
 . . . . coal  
 . . . . . **anthracite**  
 resources  
 . Earth resources  
 . . fossil fuels  
 . . . coal  
 . . . . **anthracite**  
 rocks  
 . sedimentary rocks  
 . . carbonaceous rocks  
 . . . coal  
 . . . . **anthracite**

RT mineral exploration  
 mining

**anthraquinones**

GS ketones  
 . **anthraquinones**

RT anthracene  
 dyes

**anthropology**

DEF The study of the interrelations of biological, cultural, geographical, and historical aspects of man.

RT aborigines

American Indians  
 anthropometry  
 archaeology  
 artifacts  
 case histories  
 cities  
 culture (social sciences)  
 Eskimos  
 human beings  
 minorities  
 museums  
 race factors  
 races (anthropology)  
 ∞ science  
 social factors  
 sociology

**anthropometry**

GS bioengineering  
 . biometrics  
 . . body measurement (biology)  
 . . . **anthropometry**

RT anthropology  
 body size (biology)

∞ engineering  
 human factors engineering

**antiadrenergics**

GS drugs  
 . **antiadrenergics**

RT adrenergics

**anti-aircraft missiles**

GS missiles  
 . **anti-aircraft missiles**  
 . . BOMARC missiles  
 . . . BOMARC A missile  
 . . . BOMARC B missile  
 . . Falcon missile  
 . . Mauler missile  
 . . Nike-Ajax missile  
 . . Nike-Hercules missile  
 . . Redeye missile  
 . . SIAM missiles  
 . . Sidewinder missiles  
 . . tartar missile  
 . . terrier missile

RT air to air missiles  
 antimissile missiles  
 Nike missiles  
 ramjet missiles  
 surface to air missiles

**antibiotics**

GS drugs  
 . **antibiotics**  
 . . actinomycin  
 . . penicillin  
 . . pleurotin  
 . . streptomycin  
 . . tetracyclines

RT anti-infectives and antibacterials  
 microorganisms  
 steroids

**antibodies**

GS **antibodies**  
 . gamma globulin

RT acquired immunodeficiency syndrome  
 antisera  
 biocompatibility  
 human immunodeficiency virus  
 immune systems  
 immunology  
 immunosuppression  
 inoculum  
 lymphatic system  
 physiological defenses  
 vaccines

**anticholinergics**

UF *cholinergic blocking agents*

GS drugs  
 . cholinergics  
 . . **anticholinergics**

RT curare

**antichlones**

DEF Geologic formations characterized by folds, the core of which contain stratigraphically

## anticoagulants

older rocks; they convex upward. Used for anticlinoria.

- UF *anticlinoria*
- RT domes (geology)
- geosynclines
- ∞ layers
- strata
- stratification
- stratigraphy
- synclines

*anticlinoria*

USE **anticlines**

### anticoagulants

- RT adrenergics
- ∞ agents
- heparins
- preservatives
- stabilizers (agents)

### anticoincidence detectors

(added August 2000)

DEF Detectors and related systems that differentiate ambient background noise from signals of interest by identifying unwanted input signals that co-occur in time with other signals. Often used with gamma-ray detection systems.

- UF *anticoincidence shields*
- RT background radiation
- coincidence circuits
- comparators
- counting circuits
- ∞ detectors
- discriminators
- gamma ray spectrometers
- hodoscopes
- particle telescopes
- proportional counters
- radiation counters
- scintillation counters
- signal detectors
- trigger circuits

*anticoincidence shields*

(added August 2000)

USE **anticoincidence detectors**

### anticonvulsants

- GS drugs
- . **anticonvulsants**
- RT hexamethonium

### anticyclones

- RT air masses
- atmospheric pressure
- cyclones
- high pressure
- meteorology
- synoptic meteorology

*antidetection technology*

(added November 2001)

USE **stealth technology**

### antidiuretics

- GS drugs
- . **antidiuretics**
- RT urine

### antidotes

- GS drugs
- . **antidotes**
- RT inhibitors

### antiemetics and antinauseants

- GS drugs
- . **antiemetics and antinauseants**
- RT nausea

### antiferroelectricity

- GS electrical properties
- . **antiferroelectricity**
- RT dielectric properties
- ferroelectricity
- hysteresis
- ∞ polarization

### antiferromagnetism

- GS magnetic properties
- . **antiferromagnetism**

- RT ferromagnetism
- hysteresis
- Ising model
- magnetic switching
- magnons
- neel temperature
- paramagnetism

### antifouling

DEF Measures taken to prevent corrosion or the accumulation of organic or other residues or growths on operating mechanisms, especially in underwater environments.

- GS fouling
- . **antifouling**
- RT ∞ agents
- cleaning
- contamination
- corrosion prevention
- inhibitors
- sterilization

### antifreezes

- GS additives
- . **antifreezes**
- RT antiicing additives
- freezing

### antifriction bearings

- GS bearings
- . **antifriction bearings**
- . . ball bearings
- . . roller bearings
- . . . needle bearings
- RT friction reduction
- gas bearings
- journal bearings
- rolling contact loads
- thrust bearings

### antigens

- RT anaphylaxis
- biocompatibility
- immune systems
- immunoassay
- immunology
- inoculum
- physiological defenses
- radioimmunoassay
- Rhesus factor
- vaccines

### antigravity

DEF A hypothetical effect that would arise from cancellation by some energy field of the effect of the gravitational field of the earth or other body.

- RT gravitation
- microgravity

### Antigua and Barbuda

(added February 1989)

- GS landforms
- . islands
- . . West Indies
- . . . **Antigua and Barbuda**
- nations
- . **Antigua and Barbuda**
- RT Caribbean region

### antihistaminics

- GS drugs
- . **antihistaminics**
- . . dimenhydrinate
- . . diphenyl hydantoin
- . . promethazine
- RT decongestants
- histamines

### antihypertensive agents

- GS drugs
- . **antihypertensive agents**
- RT reserpine

### antiicing additives

- GS additives
- . **antiicing additives**
- RT antifreezes
- deicers
- deicing

- fuel contamination
- ice prevention
- inhibitors
- propellant additives
- retardants

### antimicrobials and antibacterials

- GS drugs
- . **antimicrobials and antibacterials**
- RT antibiotics
- antiseptics
- bactericides
- contamination
- fungicides

### antiknock additives

- GS additives
- . **antiknock additives**
- RT automobile fuels
- gasoline
- ∞ octane
- octanes
- retardants

### antimatter

- GS **antimatter**
- . antiparticles
- . . antineutrinos
- . . antinucleons
- . . antiprotons
- . . positrons
- RT Alpha Magnetic Spectrometer
- degenerate matter
- matter (physics)
- matter-antimatter propulsion
- negative matter

### antimissile defense

- SN (PROTECTION AGAINST MISSILE ATTACK)
- GS air defense
- . **antimissile defense**
- RT antiradiation missiles
- civil defense
- ∞ defense
- defense industry
- defense program
- military technology
- missile defense
- missiles
- optical countermeasures
- Safeguard system
- Sentinel system
- space surveillance (ground based)
- space surveillance (spaceborne)

### antimissile missiles

- GS missiles
- . **antimissile missiles**
- . . Mauler missile
- . . Nike-Zeus missile
- . . Spartan missile
- . . Sprint missile
- RT antiaircraft missiles
- ballistic missiles
- infrared tracking
- missile defense
- Nike missiles
- Nike X systems
- Sentinel system
- SIAM missiles
- space weapons
- surface to air missiles

### antimisting fuels

- DEF Fuels which have an additive to reduce misting and thus create safer fuels.
- GS fuels
- . chemical fuels
- . . liquid fuels
- . . . **antimisting fuels**
- RT additives
- aircraft fuels
- flame retardants
- jet engine fuels
- kerosene

### antimonides

- GS antimony compounds
- . **antimonides**

- . . aluminum antimonides
  - . . cadmium antimonides
  - . . cesium antimonides
  - . . gallium antimonides
  - . . germanium antimonides
  - . . indium antimonides
  - . . zinc antimonides
- antimony**
- GS chemical elements
  - . metalloids
  - . . **antimony**
  - RT metals
- antimony alloys**
- GS alloys
  - . **antimony alloys**
  - . . babbitt metal
  - RT bismuth alloys
  - mulberry (alloy)
- antimony compounds**
- GS **antimony compounds**
  - . antimonides
  - . . aluminum antimonides
  - . . cadmium antimonides
  - . . cesium antimonides
  - . . gallium antimonides
  - . . germanium antimonides
  - . . indium antimonides
  - . . zinc antimonides
  - . . antimony fluorides
  - RT  $\infty$  chemical compounds
  - $\infty$  Group 5A compounds
  - $\infty$  metal compounds
- antimony fluorides**
- GS antimony compounds
  - . **antimony fluorides**
  - halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . **antimony fluorides**
  - . halides
  - . . fluorides
  - . . . **antimony fluorides**
- antimony isotopes**
- GS chemical elements
  - . metalloids
  - . . **antimony isotopes**
  - . nuclides
  - . . isotopes
  - . . . **antimony isotopes**
  - metals
  - . **antimony isotopes**
- antineutrinos**
- GS antimatter
  - . antiparticles
  - . . **antineutrinos**
  - particles
  - . elementary particles
  - . . antiparticles
  - . . . **antineutrinos**
  - . . fermions
  - . . . leptons
  - . . . . **antineutrinos**
  - . nuclear particles
  - . . antiparticles
  - . . . **antineutrinos**
  - RT charged particles
  - neutrinos
- antinodes**
- DEF Either of the two points on an orbit where a line in the orbit plane, perpendicular to the line of nodes and passing through the focus intersects the orbit. Also a point, line, or surface in a standing wave where some characteristic of the wave field has maximum amplitude.
  - RT nodes (standing waves)
  - rarefaction
  - resonant frequencies
  - standing waves
  - vibration
  - wavelengths
- antinucleons**
- GS antimatter
- . antiparticles
  - . . **antinucleons**
  - particles
  - . elementary particles
  - . . antiparticles
  - . . . **antinucleons**
  - . nuclear particles
  - . . antiparticles
  - . . . **antinucleons**
  - nucleons
- antioxidants**
- DEF Compounding ingredients used to retard deterioration caused by oxidation.
  - GS additives
  - . **antioxidants**
  - RT  $\infty$  agents
  - corrosion prevention
  - corrosion resistance
  - inhibitors
  - melatonin
  - preservatives
  - propellant additives
  - retardants
  - stabilizers (agents)
- antiparticles**
- DEF Particles with a charge of opposite signs to the same particles in normal matter.
  - GS antimatter
  - . **antiparticles**
  - . . antineutrinos
  - . . antinucleons
  - . . antiprotons
  - . . positrons
  - particles
  - . elementary particles
  - . . **antiparticles**
  - . . . antineutrinos
  - . . . antinucleons
  - . . . antiprotons
  - . . . positrons
  - . nuclear particles
  - . . **antiparticles**
  - . . . antineutrinos
  - . . . antinucleons
  - . . . antiprotons
  - . . . positrons
  - RT annihilation reactions
  - charged particles
  - hyperons
  - Pomeranchuk theorem
  - positron annihilation
- antiphase boundaries**
- (added March 1998)
  - UF *antiphase domains*
  - APB (materials)
  - GS boundaries
  - . **antiphase boundaries**
  - RT binary alloys
  - crystal dislocations
  - crystal lattices
  - crystal structure
  - grain boundaries
  - interfacial energy
  - intermetallics
  - microstructure
  - order-disorder transformations
  - solid solutions
  - solid-solid interfaces
  - superlattices
  - ternary alloys
- antiphase domains*
- (added March 1998)
  - USE **antiphase boundaries**
- antipodes**
- DEF Anything exactly opposite to something else. Particularly, that point on the Earth 180 deg. from a given place.
  - RT apsides
  - ionospheric propagation
  - propagation modes
  - radio transmission
  - zenith
- antiprotons**
- GS antimatter
- . antiparticles
  - . . **antiprotons**
  - particles
  - . charged particles
  - . . **antiprotons**
  - . elementary particles
  - . . antiparticles
  - . . . **antiprotons**
  - . nuclear particles
  - . . antiparticles
  - . . . **antiprotons**
  - nuclear particles
  - . . antiparticles
  - . . . **antiprotons**
  - proton-antiproton interactions
  - protons
- antiquities**
- DEF Man-made objects or surviving parts or fragments from the past.
  - RT artifacts
  - tools
  - weapons
- antiradar coatings**
- GS absorbers (materials)
  - . radar absorbers
  - . . **antiradar coatings**
  - coatings
  - . **antiradar coatings**
  - countermeasures
  - . electronic countermeasures
  - . . **antiradar coatings**
  - RT electronic warfare
  - inorganic coatings
  - metal coatings
  - plastic coatings
  - $\infty$  ram
  - stealth technology
- antiradiation drugs**
- UF *radioprotective agents*
  - GS drugs
  - . **antiradiation drugs**
  - . . cysteamine
  - RT nuclear medicine
  - pharmacology
  - radiation protection
  - radiation sickness
  - radiobiology
  - radiopathology
- antiradiation missiles**
- DEF Missiles that attack radiating targets such as radar transmitters, etc.
  - GS missiles
  - . **antiradiation missiles**
  - RT air defense
  - antimissile defense
  - countermeasures
  - digital radar systems
  - military technology
  - missile defense
  - remote control
- antireflection coatings**
- DEF Thin dielectric or metallic films applied to an optical surface to reduce the reflectance and thereby increase the transmittance. Note: The ideal value of the reactive index of a single layered film is the square root of the product of the refractive indices on either side of the film, the ideal optical thickness being one quarter of a wavelength.
  - GS coatings
  - . **antireflection coatings**
  - RT lens design
  - optical coatings
  - optical reflection
  - optical thickness
  - solar cells
- antiseptics**
- UF *disinfectants*
  - RT acriflavine
  - antiinfectives and antibacterials
  - bactericides
  - chemical sterilization
  - chemotherapy
  - cleaning
  - decontamination
  - environmental control
  - fumigation



## antiserums

infectious diseases  
purification  
sterilization

### antiserums

RT antibodies  
immunology  
serums  
vaccines

### antiship missiles

GS missiles  
. **antiship missiles**  
RT cruise missiles  
sea launching  
ships  
submarines  
weapon systems

### antiship warfare

GS warfare  
. **antiship warfare**  
RT missiles  
sea launching  
ships  
submarines  
warheads  
weapons

### antisite defects

(added July 1997)

DEF Point defects occurring in crystalline compounds where an atom of one atomic species occupies an atomic site that is allocated to a different atomic species (e.g., in GaAs, an arsenic atom may sit on a site allocated to a gallium atom). If the nearest neighbor sites are occupied with the correct species for their sites (e.g., an arsenic antisite atom surrounded by arsenic atoms), the antisite atom is then bonded to four like atoms (rather than four Ga atoms). Such a configuration is not electrically neutral, but acts as a double donor. An "antisite pair" occurs if two adjacent atoms have simply been interchanged.

GS defects  
. crystal defects  
. . . point defects  
. . . **antisite defects**  
RT donor materials  
gallium arsenides  
interstitials  
semiconductors (materials)  
vacancies (crystal defects)

### antiskid devices

RT aircraft brakes  
arresting gear  
automobiles  
brakes (for arresting motion)  
∞ devices  
landing aids  
safety devices  
trucks  
wheel brakes

### antistatic devices

USE **static dischargers**

### antisubmarine warfare

GS warfare  
. **antisubmarine warfare**  
RT ASROC engine  
military technology  
sonobuoys  
submarines  
torpedoes  
underwater explosions  
underwater trajectories

### antisubmarine warfare aircraft

GS **antisubmarine warfare aircraft**  
. Breguet 1150 aircraft  
. CL-84 aircraft  
. P-3 aircraft  
. S-2 aircraft  
. S-3 aircraft  
. SH-3 helicopter  
. SH-4 helicopter  
RT ∞ aircraft

attack aircraft  
bomber aircraft  
drone aircraft  
H-25 helicopter  
∞ military aircraft  
observation aircraft  
P-531 helicopter  
reconnaissance aircraft  
S-61 helicopter  
submersible aircraft  
V/STOL aircraft  
water takeoff and landing aircraft

### antisymmetry

RT asymmetry  
chirality  
symmetry

### antitank missiles

GS missiles  
. surface to surface missiles  
. . . **antitank missiles**  
. . . Shillelagh missiles  
. . . tow missiles

### Antonov aircraft

GS **Antonov aircraft**  
. AN-2 aircraft  
. AN-22 aircraft  
. AN-24 aircraft  
RT ∞ aircraft

### Antonov AN-22 aircraft

USE **AN-22 aircraft**

### Antonov AN-24 aircraft

USE **AN-24 aircraft**

### anvil clouds

GS clouds (meteorology)  
. convection clouds  
. . . cumulonimbus clouds  
. . . **anvil clouds**  
. . . cumulus clouds  
. . . **anvil clouds**  
RT atmospheric moisture  
climatology  
cloud cover  
fog  
meteorology  
nephelometry  
precipitation (meteorology)  
thunderstorms  
weather

### anvils

RT compressing  
tools

### anxiety

DEF Nervous or fear reaction to a perception of danger.  
RT detachment  
fear  
fear of flying  
phobias  
stress (biology)  
Taylor manifest anxiety scale

### AO-1 aircraft

USE **OV-1 aircraft**

### AOIPS

USE **Atmospheric & Oceanographic Inform Sys**

### aorta

GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . blood vessels  
. . . . arteries  
. . . . **aorta**  
RT heart

### AOSO

UF *Advanced Orbiting Solar Observatory*  
GS artificial satellites  
. geophysical satellites  
. . . OSO  
. . . **AOSO**

. scientific satellites  
. . . astronomical satellites  
. . . . OSO  
. . . . **AOSO**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . OSO  
. . . . **AOSO**  
. . . solar observatories  
. . . OSO  
. . . . **AOSO**  
. . . geophysical observatories  
. . . OSO  
. . . . **AOSO**  
RT sun

### Apache rocket vehicle

GS rocket vehicles  
. sounding rockets  
. . . **Apache rocket vehicle**  
RT sondes

### apatites

USE **calcium phosphates minerals**

### APB (materials)

(added March 1998)

USE **antiphase boundaries**

### aperiodic functions

GS analysis (mathematics)  
. **aperiodic functions**  
functions (mathematics)  
. **aperiodic functions**  
RT complex variables  
real variables

### apertures

GS openings  
. **apertures**  
. . . irises (mechanical apertures)  
. . . numerical aperture  
. . . synthetic apertures  
RT apodization  
cavities  
doors  
gates (openings)  
infrared windows  
louvers  
orifices  
outlets  
pinhole cameras  
ports (openings)  
slits  
synthetic arrays  
vents  
VSAT (network)  
windows (apertures)

### apes

GS animals  
. vertebrates  
. . . mammals  
. . . . primates  
. . . . **apes**  
. . . . . chimpanzees

### apexes

UF *vertices*  
RT altitude  
aphelions  
apogees  
maxima  
orbits  
∞ peaks  
plateaus  
trajectories  
zenith

### aphelions

GS apsides  
. **aphelions**  
RT apexes  
elliptical orbits  
orbits  
perihelions

- solar orbits
- API (computers)  
(added June 2003)  
USE **application programming interface**
- APL (programming language)**  
DEF "A Programming Language" is a high level interactive computer language primarily designed for mathematical applications. It was developed by Kenneth Iverson in 1962. It is characterized by extensive operators and array handling capability. NASA Goddard was one of the first users and was instrumental in introducing APL to the computer community.  
GS languages  
. programming languages  
. . . **APL (programming language)**  
RT computer programming
- apnea  
USE **respiration**
- apodization**  
(added October 2002)  
DEF The elimination or smoothing of sharp discontinuities in an image, electrical signal, or mathematical function; as in the modification of lens design to reduce diffraction fringes, or the mathematical processing of interferograms to suppress sidelobes.  
RT apertures  
Bragg gratings  
gratings (spectra)  
imaging techniques  
optical filters  
sidelobe reduction  
wave diffraction
- apogee boost motors**  
UF *ABM*  
*apogee kick motors*  
GS engines  
. rocket engines  
. . booster rocket engines  
. . . **apogee boost motors**  
. . solid propellant rocket engines  
. . . **apogee boost motors**  
RT  $\infty$  boosters  
motors
- apogee kick motors*  
USE **apogee boost motors**
- apogees**  
DEF Those orbital points farthest from the Earth, when the Earth is the center of attraction.  
GS apsides  
. **apogees**  
RT apexes  
Earth orbits  
elliptical orbits  
orbits  
perigees
- Apollo 5 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 5 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
lunar spacecraft  
moon-Earth trajectories
- Apollo 6 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 6 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing
- Apollo 7 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 7 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 8 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 8 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 9 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 9 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module
- Apollo 10 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 10 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 11 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 11 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 12 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 12 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module
- Apollo 13 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 13 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 14 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 14 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 15 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 15 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories  
SIM
- Apollo 16 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 16 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo 17 flight**  
GS space flight  
. manned space flight  
. . Apollo flights  
. . . **Apollo 17 flight**  
RT Earth-Moon trajectories  
lunar exploration  
Lunar Exploration System for Apollo  
lunar flight  
lunar landing  
lunar launch  
Lunar Module  
manned spacecraft  
moon-Earth trajectories
- Apollo applications program**  
GS programs  
. NASA programs  
. . NASA space programs  
. . . **Apollo applications program**  
. space programs  
. . NASA space programs  
. . . **Apollo applications program**  
RT AAP 1 mission  
AAP 2 mission  
AAP 3 mission

## Apollo asteroids

- AAP 4 mission
- airlock modules
- Earth Resources Program
- Earth Resources Survey Program
- Saturn 1 workshop
- Saturn 5 workshop
- Saturn project
- Saturn workshops
- Skylab program

### Apollo asteroids

DEF Earth grazing asteroids in orbits between Mars and Jupiter, and crossing the Earth's orbit. This group contains 19 known asteroids.

- GS celestial bodies
  - . asteroids
  - . . **Apollo asteroids**
- RT asteroid belts
- astronomy
- Chiron
- Earth orbits
- Jupiter (planet)
- Mars (planet)
- planetary orbits
- solar system

### Apollo extension system

- RT exobiology
- extravehicular activity
- lunar landing modules
- manned space flight
- NASA programs
- orbital workshops
- ∞ systems

### Apollo flights

- GS space flight
  - . manned space flight
  - . . **Apollo flights**
  - . . . Apollo 5 flight
  - . . . Apollo 6 flight
  - . . . Apollo 7 flight
  - . . . Apollo 8 flight
  - . . . Apollo 9 flight
  - . . . Apollo 10 flight
  - . . . Apollo 11 flight
  - . . . Apollo 12 flight
  - . . . Apollo 13 flight
  - . . . Apollo 14 flight
  - . . . Apollo 15 flight
  - . . . Apollo 16 flight
  - . . . Apollo 17 flight
- RT Skylab program

### Apollo lunar experiment module

- GS lunar spacecraft
  - . Apollo spacecraft
  - . . **Apollo lunar experiment module**
  - . . lunar landing modules
  - . . Lunar Module
  - . . . **Apollo lunar experiment module**
  - maneuverable spacecraft
  - . Apollo spacecraft
  - . . **Apollo lunar experiment module**
  - manned spacecraft
  - . Apollo spacecraft
  - . . **Apollo lunar experiment module**
  - . Lunar Module
  - . . **Apollo lunar experiment module**
  - modules
  - . spacecraft modules
  - . . landing modules
  - . . . lunar landing modules
  - . . . . Lunar Module
  - . . . . . **Apollo lunar experiment module**
  - reentry vehicles
  - . recoverable spacecraft
  - . . Apollo spacecraft
  - . . . **Apollo lunar experiment module**
  - soft landing spacecraft
  - . Apollo spacecraft
  - . . **Apollo lunar experiment module**
  - . landing modules
  - . . lunar landing modules
  - . . . Lunar Module

- . . . . **Apollo lunar experiment module**
- spacecraft components
- . spacecraft modules
- . . landing modules
- . . . lunar landing modules
- . . . . Lunar Module
- . . . . . **Apollo lunar experiment module**
- RT lunar exploration
- lunar landing

### Apollo Lunar Surface Experiments Package

- UF *ALSEP*
- GS packages
  - . instrument packages
  - . . **Apollo Lunar Surface Experiments Package**
- RT ∞ instruments
- lunar exploration
- lunar retroreflectors
- payloads
- ∞ surfaces

### Apollo project

- GS programs
  - . lunar programs
  - . . **Apollo project**
  - . NASA programs
  - . . NASA space programs
  - . . . **Apollo project**
  - . projects
  - . . **Apollo project**
  - . space programs
  - . . NASA space programs
  - . . . **Apollo project**
- RT AAP 1 mission
- AAP 2 mission
- AAP 3 mission
- AAP 4 mission
- Advanced Range Instrumentation Aircraft
- command service modules
- LSSM
- lunar exploration
- Lunar Exploration System for Apollo
- lunar mobile laboratories
- lunar probes
- manned spacecraft
- Marquardt R4D engine
- Mercury project
- Saturn 1 workshop
- Saturn 5 workshop
- Saturn launch vehicles
- Saturn workshops
- SIM
- site data processors
- Skylab program
- soft landing spacecraft

### Apollo short stack

- RT spacecraft configurations

### Apollo Soyuz test project

- UF *ASTP*
- GS programs
- . projects
- . . **Apollo Soyuz test project**
- RT international cooperation
- international relations
- manned spacecraft
- rendezvous
- Soyuz spacecraft
- space flight
- space missions
- space programs
- space rendezvous
- spacecrew transfer
- U.S.S.R. space program

### Apollo spacecraft

- GS lunar spacecraft
  - . **Apollo spacecraft**
  - . . Apollo lunar experiment module
  - maneuverable spacecraft
  - . **Apollo spacecraft**
  - . . Apollo lunar experiment module
  - manned spacecraft
  - . **Apollo spacecraft**
  - . . Apollo lunar experiment module

- reentry vehicles
- . recoverable spacecraft
- . . **Apollo spacecraft**
- . . . Apollo lunar experiment module
- soft landing spacecraft
- . **Apollo spacecraft**
- . . Apollo lunar experiment module
- RT command modules
- landing modules
- Lunar Module
- Lunar Module 5
- Lunar Module 7
- manned orbital laboratories
- Saturn project
- service modules
- Skylab program
- unified S band

### Apollo telescope mount

- GS telescopes
  - . manned orbital telescopes
  - . . **Apollo telescope mount**
- RT Skylab program

### apoptosis

(added October 2000)

DEF One of the two mechanisms by which cell death occurs (the other being the pathological process of NECROSIS). Apoptosis is the mechanism responsible for the physiological deletion of cells and appears to be intrinsically programmed. It is characterized by distinctive morphologic changes in the nucleus and cytoplasm, chromatin cleavage at regularly spaced sites, and the endonucleolytic cleavage of genomic DNA at internucleosomal sites. This mode of cell death serves as a balance to mitosis in regulating the size of animal tissues and in mediating pathological processes associated with tumor growth.

- UF *programmed cell death*
- GS physiological effects
- . **apoptosis**
- RT biological effects
- cells (biology)
- cytology
- death
- deoxyribonucleic acid
- necrosis
- radiation effects

### Appalachian Mountains (North America)

- GS landforms
  - . mountains
  - . . **Appalachian Mountains (North America)**
- RT North America

### apparatus

- USE **equipment**

### appearance

- RT imagery
- quality
- visibility

### appendages

- GS **appendages**
  - . arm (anatomy)
  - . . elbow (anatomy)
  - . . forearm
  - . . hand (anatomy)
  - . . fingers
  - . . leg (anatomy)
  - . . feet (anatomy)
  - . . knee (anatomy)
  - . . thigh
- RT anatomy
- human body
- limbs (anatomy)

### appendix (anatomy)

- GS anatomy
  - . digestive system
  - . . gastrointestinal system
  - . . . **appendix (anatomy)**

- RT intestines
- application*  
USE **utilization**
- application programming interface**  
(added June 2003)  
DEF An interface between a software or hardware system and an application program which allows the application program to communicate with, and to access services from the software or hardware system  
UF *API (computers)*  
RT computer systems programs
- application specific integrated circuits**  
(added May 1989)  
UF *ASIC*  
*custom integrated circuits*  
GS circuits  
. integrated circuits  
. . . **application specific integrated circuits**  
RT chips (electronics)  
large scale integration  
systems-on-a-chip  
very large scale integration
- Applications Explorer Satellites**  
GS artificial satellites  
. scientific satellites  
. . . Explorer satellites  
. . . **Applications Explorer Satellites**  
RT Heat Capacity Mapping Mission
- ∞ **applications of mathematics**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *mathematical analysis*  
RT analysis (mathematics)  
approximation  
combinatorial analysis  
computation  
dimensional analysis  
dynamic programming  
econometrics  
error analysis  
finite element method  
fractals  
functions (mathematics)  
information theory  
Kalman-Schmidt filtering  
linear programming  
mathematical models  
nonlinear programming  
numerical analysis  
operational calculus  
operations research  
optimization  
parameterization  
probability theory  
statistical analysis  
stochastic processes  
time series analysis
- applications programs (computers)**  
DEF Software designed to fulfill specific needs of a user; for example, software for navigation, payroll, or process control.  
GS computer programs  
. **applications programs (computers)**  
. . . NASTRAN  
. . . spreadsheets  
. . . web services  
RT computers  
software development tools
- Applications Technology Satellites*  
USE **ATS**
- approach**  
GS **approach**  
. airborne radar approach  
. instrument approach  
RT air traffic control  
aircraft approach spacing  
arrivals  
descent  
flight paths  
flight plans  
ground based control  
guidance (motion)  
landing  
landing aids  
passageways  
touchdown
- approach and landing tests (STS)**  
DEF A series of flight maneuvers involving the Space Shuttle.  
RT evaluation  
horizontal spacecraft landing  
landing  
manned spacecraft  
space shuttles  
space transportation system  
spacecraft landing  
∞ tests  
touchdown
- approach control**  
DEF The control process which delivers aircraft to the final approach course or landing system properly spaced for their landing.  
GS **approach control**  
. radar approach control  
RT air traffic control  
aircraft approach spacing  
aircraft communication  
aircraft guidance  
aircraft maneuvers  
automated en route ATC  
collision avoidance  
∞ control  
flight paths  
glide paths  
ground based control  
instrument approach  
instrument flight rules  
instrument landing systems  
landing aids  
landing radar  
microwave landing systems  
night flights (aircraft)  
runway lights  
tracking (position)  
traffic control  
visual control
- approach indicators**  
GS aircraft instruments  
. **approach indicators**  
display devices  
. **approach indicators**  
flight instruments  
. **approach indicators**  
landing aids  
. landing instruments  
. . . **approach indicators**  
measuring instruments  
. indicating instruments  
. . . **approach indicators**  
RT air traffic control  
altimeters  
blind landing  
glide paths  
instrument approach  
instrument landing systems  
microwave scanning beam landing system  
navigation aids  
radar approach control  
solar compasses  
speed indicators
- appropriations**  
RT budgeting  
cost estimates  
federal budgets  
grants
- approximation**  
UF *approximation methods*  
*nominal values*  
*truncation (mathematics)*  
GS analysis (mathematics)  
. numerical analysis  
. . . **approximation**  
. . . Born approximation  
. . . Born-Oppenheimer approximation  
. . . Chebyshev approximation  
. . . Eddington approximation  
. . . essentially non-oscillatory schemes  
. . . finite difference theory  
. . . finite difference time domain method  
. . . finite element method  
. . . Hartree approximation  
. . . least squares method  
. . . mean square values  
. . . Milne method  
. . . multigrid methods  
. . . Newton methods  
. . . Newton-Raphson method  
. . . boundary element method  
. . . discretization (mathematics)  
. . . numerical differentiation  
. . . Oseen approximation  
. . . Pade approximation  
. . . particle in cell technique  
. . . Pohlhausen method  
. . . predictor-corrector methods  
. . . Rayleigh-Ritz method  
. . . relaxation method (mathematics)  
. . . Reynolds averaging  
. . . Ritz averaging method  
. . . Schwartz method  
. . . Sommerfeld approximation  
. . . TVD schemes  
. . . upwind schemes (mathematics)  
. . . vortex in cell technique  
. . . Trefftz method  
. . . computational mechanics  
. . . meshfree methods  
RT ∞ applications of mathematics  
censored data (mathematics)  
difference equations  
∞ equations  
form factors  
Glauber theory  
Godunov method  
∞ methodology  
minimax technique  
numerical stability  
problem solving  
∞ relationships  
spline functions  
static models  
statistical analysis
- approximation methods*  
USE **approximation**
- apsidal angles*  
USE **apsides**
- apsides**  
UF *apsidal angles*  
GS **apsides**  
. aphelions  
. apogees  
. perigees  
. perihelions  
. perilunes  
RT angles (geometry)  
antipodes  
elliptical orbits  
orbital elements  
orbital mechanics
- APT (picture transmission)*  
USE **automatic picture transmission**
- aptitude**  
GS abilities  
. **aptitude**  
RT learning  
personnel selection
- Aqua spacecraft**  
(added May 2005)  
DEF Second in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. Aqua studies the Earth's water cycle, including evaporation from the oceans, water vapor in the atmosphere,

## Aquarid meteoroids

clouds, precipitation, soil moisture, sea ice, land ice, and snow cover on the land and ice. The spacecraft carries six instruments: the Atmospheric Infrared Sounder (AIRS), the Advanced Microwave Sounding Unit (AMSU-A), the Humidity Sounder for Brazil (HSB), the Advanced Microwave Scanning Radiometer for EOS (AMSR-E), the Moderate Resolution Imaging Spectroradiometer (MODIS), and Clouds and the Earth's Radiant Energy System (CERES).

UF *EOS PM (satellite)*  
GS artificial satellites  
. scientific satellites  
. . **Aqua spacecraft**  
Earth Observing System (EOS)  
. **Aqua spacecraft**  
RT Aura spacecraft  
CALIPSO (Pathfinder satellite)  
CERES (experiment)  
CloudSat  
data products  
Earth observations (from space)  
MODIS (radiometry)  
remote sensing  
Terra spacecraft

**Aquarid meteoroids**  
GS celestial bodies  
. meteoroid showers  
. . **Aquarid meteoroids**  
. meteoroids  
. . **Aquarid meteoroids**  
RT Orionid meteoroids

**aquatic plants**  
DEF Plants growing in or on water.  
GS plants (botany)  
. **aquatic plants**  
. . phytoplankton  
RT aquaculture  
hydroponics  
marine biology

**aqueous solutions**  
GS mixtures  
. solutions  
. . **aqueous solutions**  
RT hydrates  
solvation

**aquiculture**  
DEF The cultivation (breeding, raising, and harvesting) of fish, mollusks, shellfish, and/or other aquatic life as sources of food.  
GS agriculture  
. **aquiculture**  
RT aquatic plants  
fisheries  
fishes  
hydroponics  
marine biology  
marine environments  
marine resources  
marine technology  
∞ nutrients  
tidal flats

**aquifers**  
DEF Bodies of rock that contain sufficient saturated permeable material to conduct ground water and to yield economically significant quantities of ground water to wells and springs.  
GS resources  
. Earth resources  
. . water resources  
. . . **aquifers**  
RT fresh water  
gravels  
ground water  
hydrogeology  
hydrology  
hydrothermal systems  
lakes  
limnology  
oases  
permeability  
ponds  
porosity  
rain  
sands

springs (water)  
streams  
water  
water tables  
wells

*Arabian commercial satellite*  
USE **Arcomsat**

**Arabian Sea**  
GS seas  
. **Arabian Sea**  
RT Indian Ocean

**Arabsat**  
GS artificial satellites  
. **Arabsat**  
RT international cooperation  
Saudi Arabian space program

**aragonite**  
DEF A white, yellowish, or gray orthorhombic mineral, that contains calcium carbonate.  
GS calcium compounds  
. calcium carbonates  
. . **aragonite**  
carbon compounds  
. carbonates  
. . calcium carbonates  
. . . **aragonite**  
minerals  
. **aragonite**  
silicon compounds  
. silicates  
. . **aragonite**  
RT calcite

**aramid fiber composites**  
(added May 1992)  
SN (ARAMID FIBER UTILIZATION IN COMPOSITES. FOR PROPERTIES OF ARAMID FIBERS THEMSELVES USE 'ARAMID FIBERS'.)  
GS composite materials  
. fiber composites  
. . **aramid fiber composites**  
RT aramid fibers  
epoxy matrix composites  
Kevlar (trademark)  
metal matrix composites  
polyamide resins  
polymer matrix composites  
reinforced plastics  
whisker composites

**aramid fibers**  
(added May 1992)  
SN (PROPERTIES OF ARAMID FIBERS THEMSELVES. FOR ARAMID FIBER UTILIZATION IN COMPOSITES USE 'ARAMID FIBER COMPOSITES'.)  
GS fibers  
. reinforcing fibers  
. . **aramid fibers**  
. . . Kevlar (trademark)  
. synthetic fibers  
. . **aramid fibers**  
. . . Kevlar (trademark)  
RT aramid fiber composites  
composite materials  
epoxy matrix composites  
fiber composites  
fiber orientation  
fiber strength  
lay-up  
plastics  
polyamide resins  
reinforced plastics  
reinforcing materials  
resin matrix composites

**arc chambers**  
RT ∞ chambers  
electric arcs  
plasma generators  
thrust chambers

**arc clouds**  
GS clouds (meteorology)  
. convection clouds  
. . **arc clouds**  
RT cyclogenesis

fronts (meteorology)  
mesoscale phenomena  
meteorology  
observation aircraft  
satellite observation  
thunderstorms

**arc discharges**  
GS electric current  
. electric discharges  
. . **arc discharges**  
RT electric arcs

**arc generators**  
RT electric arcs  
electric generators  
electrostatic generators  
∞ generators  
∞ induction  
inductors  
plasma generators  
spark gaps  
spark plugs  
voltage generators

**arc heating**  
UF *Gerdien arc heaters*  
GS heating  
. **arc heating**  
RT gas heating  
image furnaces  
plasma heating  
resistance heating  
Saha equations

**arc jet engines**  
DEF Electrothermal rocket engines that produce thrust by expanding a hot gas in an appropriate nozzle to a high velocity. The propellant is heated to a higher temperature than can be obtained through combustion processes resulting in higher exhaust velocities and better propellant efficiency.  
GS engines  
. rocket engines  
. . electric rocket engines  
. . . electrothermal engines  
. . . . **arc jet engines**  
. . . . pulsed jet engines  
RT electric propulsion  
electrostatic engines  
magnetoplasmadynamic thrusters  
plasma engines  
resistojet engines

**arc lamps**  
GS lighting equipment  
. luminaires  
. . **arc lamps**  
RT carbon arcs  
light sources  
mercury arcs  
searchlights  
xenon lamps

**arc melting**  
GS phase transformations  
. melting  
. . **arc melting**  
RT drop transfer  
electroslag refining  
vacuum melting  
zone melting

**arc spraying**  
UF *plasma arc spraying*  
GS spraying  
. **arc spraying**  
RT metal spraying

**arc welding**  
GS welding  
. fusion welding  
. . electric welding  
. . . **arc welding**  
. . . . gas tungsten arc welding  
. . . . plasma arc welding  
RT electron beam welding  
heat affected zone  
pressure welding

- spot welds  
sputtering
- Arcas rocket vehicles**  
GS rocket vehicles  
. single stage rocket vehicles  
. . . **Arcas rocket vehicles**  
. sounding rockets  
. . . **Arcas rocket vehicles**  
RT radiosondes  
solid propellant rocket engines  
∞ vehicles
- archaeobacteria**  
DEF Organisms belonging to the taxonomic kingdom of the same name which are characterized by distinct t- and r-RNAs, the absence of peptidoglycan cell walls and their possible replacement by a proteinaceous coat, ether-linked lipids from phytanyl chains, and occurrence in unusually harsh habitats, e.g., methane, halide and thermoacidic environments. These hardy bacteria are significant in the study of the origin of life.  
GS microorganisms  
. bacteria  
. . . **archaeobacteria**  
RT bacteriology  
biological evolution  
paleobiology  
paleontology
- archaeology**  
RT anthropology  
cultural resources  
fossils  
ground penetrating radar  
paleomagnetism
- archaeomagnetism*  
(added April 1999)  
USE **paleomagnetism**
- arches**  
RT perforated shells  
rigid structures  
shells (structural forms)  
trusses
- archipelagoes**  
DEF Seas or areas in seas that contain numerous islands; also the island groups themselves.  
RT Aleutian Islands (US)  
islands  
landforms  
seas  
Spitsbergen (Norway)  
Virgin Islands
- architecture**  
RT acoustics  
buildings  
construction  
∞ construction materials  
human factors engineering  
illuminating  
plant design  
Starsite program  
structural design  
∞ structures
- architecture (computers)**  
DEF The design of system and logic organization and information flow relationships in a computer rather than the circuit and component features.  
UF *computer architecture*  
GS **architecture (computers)**  
. service oriented architecture  
RT client server systems  
computer components  
computer design  
concurrent processing  
Connection Machine  
distributed memory  
distributed processing  
hypercube multiprocessors  
local area networks  
logic circuits
- logic design  
massively parallel processors  
memory (computers)  
MIMD (computers)  
modularity  
multidisciplinary design optimization  
programmable logic devices  
relational data bases  
RISC processors  
SIMD (computers)  
software development tools  
supercomputers  
systolic arrays  
transputers  
very large scale integration
- Arcomsat**  
UF *Arabian commercial satellite*  
GS artificial satellites  
. communication satellites  
. . . **Arcomsat**  
RT Africa  
international cooperation  
Saudi Arabian space program  
Symphonie satellites  
synchronous satellites
- Arcon rocket vehicle**  
GS rocket vehicles  
. **Arcon rocket vehicle**  
RT ∞ vehicles
- ∞ **arcs**  
SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))  
RT auroral arcs  
curves (geometry)  
electric arcs  
island arcs  
magnetic annular arc  
plasma jets  
red arcs
- Arctic environments*  
USE **ice environments**
- Arctic Ocean**  
GS oceans  
. **Arctic Ocean**  
RT Barents Sea  
Beaufort Sea (North America)  
Greenland  
polynyas  
Spitsbergen (Norway)
- Arctic regions**  
GS Northern Hemisphere  
. **Arctic regions**  
. . . subarctic regions  
regions  
. polar regions  
. . . **Arctic regions**  
. . . subarctic regions  
. remote regions  
. . . **Arctic regions**  
. . . subarctic regions  
RT Chukchi Sea  
climatology  
geography  
muskegs  
nunataks  
ozone depletion  
polar caps  
Siberia  
tundra
- area**  
RT ∞ cross sections  
geometry  
integral calculus  
line of sight  
∞ sectors  
∞ surfaces  
volume
- area navigation**  
DEF A method of navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigation
- signals or within the limits of self-contained system capability.  
GS navigation  
. air navigation  
. . . **area navigation**  
RT flight paths  
ground tracks
- Arend-Roland comet**  
GS celestial bodies  
. comets  
. . . **Arend-Roland comet**  
RT solar system
- Ares 1 first stage**  
(added November 2006)  
DEF A single, five-segment reusable solid rocket booster derived from the Space Shuttle Program's reusable solid rocket motor.  
GS launch vehicles  
. Ares 1 launch vehicle  
. . . **Ares 1 first stage**  
rocket vehicles  
. multistage rocket vehicles  
. . . Ares 1 launch vehicle  
. . . . **Ares 1 first stage**  
RT booster rocket engines
- Ares 1 launch vehicle**  
(added November 2006)  
DEF An in-line, two-stage rocket configuration topped by the Orion crew exploration vehicle, a service module, and a launch abort system.  
GS launch vehicles  
. **Ares 1 launch vehicle**  
. . . Ares 1 first stage  
. . . Ares 1 upper stage  
rocket vehicles  
. multistage rocket vehicles  
. . . **Ares 1 launch vehicle**  
. . . . Ares 1 first stage  
. . . . Ares 1 upper stage  
RT Ares 5 cargo launch vehicle  
Constellation program  
Crew Exploration Vehicle
- Ares 1 upper stage**  
(added November 2006)  
DEF Second stage of the Ares 1 launch vehicle incorporating a J-2X liquid oxygen/hydrogen main engine.  
GS launch vehicles  
. Ares 1 launch vehicle  
. . . **Ares 1 upper stage**  
rocket vehicles  
. multistage rocket vehicles  
. . . Ares 1 launch vehicle  
. . . . **Ares 1 upper stage**  
RT Crew Exploration Vehicle  
J-2 engine  
upper stage rocket engines
- Ares 5 cargo launch vehicle**  
(added November 2006)  
DEF A two-stage heavy-lift launch vehicle comprised of a first stage having two five-segment reusable rocket boosters and a single liquid-fueled core propulsion booster; and an upper stage (Earth Departure Stage) propelled by a J-2X main engine.  
GS launch vehicles  
. heavy lift launch vehicles  
. . . **Ares 5 cargo launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . . **Ares 5 cargo launch vehicle**  
RT Altair Lunar Lander  
Ares 1 launch vehicle  
booster rocket engines  
Constellation program  
J-2 engine
- ARES (spacecraft)*  
USE **Advanced Recon Electric Spacecraft**
- Argentina**  
GS nations  
. **Argentina**

## Argentine space program

RT Argentine space program  
South America

**Argentine space program**  
(added May 1989)

GS programs  
. space programs  
. . **Argentine space program**

RT Argentina

**Argo rocket vehicles**

GS rocket vehicles  
. multistage rocket vehicles  
. . **Argo rocket vehicles**

RT Honest John rocket vehicle  
Javelin rocket vehicle  
Nike-Ajax missile  
solid propellant rocket engines  
sounding rockets  
∞ vehicles

**argon**

GS chemical elements  
. rare gases  
. . **argon**  
. . . argon isotopes  
gases  
. rare gases  
. . **argon**  
. . . argon isotopes

RT radiation trapping

**argon isotopes**

GS chemical elements  
. nuclides  
. . isotopes  
. . . **argon isotopes**  
. rare gases  
. . argon  
. . . **argon isotopes**  
gases  
. rare gases  
. . argon  
. . . **argon isotopes**

**argon lasers**

GS stimulated emission devices  
. lasers  
. . **argon lasers**

RT chemical lasers  
continuous wave lasers  
gas masers  
infrared lasers  
Mach-Zehnder interferometers  
molecular oscillations  
pulsed lasers  
Q switched lasers  
stimulated emission

**argon plasma**

GS particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)  
. . . . **argon plasma**  
. corpuscular radiation  
. . energetic particles  
. . . plasmas (physics)  
. . . . **argon plasma**

RT helium plasma  
hydrogen plasma  
oxygen plasma

**argon-oxygen atmospheres**

GS controlled atmospheres  
. **argon-oxygen atmospheres**

RT aerospace environments  
∞ atmospheres  
∞ breathing  
gas mixtures  
portable life support systems  
underwater breathing apparatus

**Argos system**

GS networks  
. satellite networks  
. . **Argos system**

RT data collection platforms  
data transmission  
ocean data acquisitions systems

satellite doppler positioning

**Argosy MK-1 aircraft**

GS Hawker Siddeley aircraft  
. **Argosy MK-1 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **Argosy MK-1 aircraft**  
monoplanes  
. **Argosy MK-1 aircraft**  
transport aircraft  
. **Argosy MK-1 aircraft**

RT ∞ aircraft

*arguments (mathematics)*

USE **independent variables**

**Argus project**

GS programs  
. projects  
. . **Argus project**

RT thermonuclear explosions

**Ariane 4 launch vehicle**  
(added April 1995)

GS launch vehicles  
. Ariane launch vehicle  
. . **Ariane 4 launch vehicle**

RT European space programs  
space commercialization

**Ariane 5 launch vehicle**  
(added April 1995)

GS launch vehicles  
. Ariane launch vehicle  
. . **Ariane 5 launch vehicle**

RT Automated Transfer Vehicle  
European space programs  
space commercialization

**Ariane launch vehicle**

GS launch vehicles  
. **Ariane launch vehicle**  
. . Ariane 4 launch vehicle  
. . Ariane 5 launch vehicle

RT Eldo launch vehicle  
Europa launch vehicles  
European Space Agency  
European space programs  
Geosari project

**arid lands**

GS land  
. **arid lands**

RT barren land  
Death Valley (CA)  
desertification  
desertline  
deserts  
drought  
Earth environment  
Earth resources  
equatorial regions  
Gobi desert  
Mojave Desert (CA)  
oases  
Sahara Desert (Africa)  
soils  
steppes  
wadis

**Ariel**

DEF A satellite of Uranus orbiting at a mean distance of 192,000 kilometers.

GS celestial bodies  
. natural satellites  
. . icy satellites  
. . . **Ariel**  
. . Uranus satellites  
. . . **Ariel**

RT Uranus (planet)

**Ariel 1 satellite**

UF *S-51 satellite*

GS artificial satellites  
. Ariel satellites  
. . **Ariel 1 satellite**

**Ariel 2 satellite**

UF *S-52 satellite*

GS artificial satellites  
. Ariel satellites  
. . **Ariel 2 satellite**

**Ariel 3 satellite**

GS artificial satellites  
. Ariel satellites  
. . **Ariel 3 satellite**

**Ariel 4 satellite**

GS artificial satellites  
. Ariel satellites  
. . **Ariel 4 satellite**  
. scientific satellites  
. . UK satellites  
. . . **Ariel 4 satellite**

RT ionospheric electron density  
ionospheric sounding

**Ariel 5 satellite**

DEF One in a series of artificial satellites launched for Britain by the United States.

GS artificial satellites  
. Ariel satellites  
. . **Ariel 5 satellite**  
. scientific satellites  
. . UK satellites  
. . . **Ariel 5 satellite**

**Ariel satellites**

GS artificial satellites  
. **Ariel satellites**  
. . Ariel 1 satellite  
. . Ariel 2 satellite  
. . Ariel 3 satellite  
. . Ariel 4 satellite  
. . Ariel 5 satellite

RT geophysical satellites  
Thor Delta launch vehicle

**Aries constellation**

GS constellations  
. **Aries constellation**

RT celestial bodies  
celestial sphere  
stars

**Aries sounding rocket**

DEF The largest in terms of weight and volume of the sounding rockets. It has a 44 inch payload capacity.

GS rocket vehicles  
. sounding rockets  
. . **Aries sounding rocket**

**Arietid meteoroids**

GS celestial bodies  
. meteoroid showers  
. . **Arietid meteoroids**  
. meteoroids  
. . **Arietid meteoroids**

*ARIP (impact prediction)*

USE **computerized simulation impact prediction**

*ARIS instrumentation ship*

USE **Advanced Range Instrumentation Ship**

**arithmetic**

GS number theory  
. **arithmetic**  
. . double precision arithmetic  
. . fixed point arithmetic  
. . floating point arithmetic

RT addition  
calculators  
computation  
dividing (mathematics)  
exponents  
integers  
multiplication  
subtraction  
sums

**arithmetic and logic units**

UF *ALU (computer components) logic units*

GS computer components  
. central processing units

- . . arithmetic and logic units  
 RT computers  
 double precision arithmetic  
 logic circuits
- Arizona**  
 GS nations  
 . United States  
 . . **Arizona**  
 RT Colorado Plateau (US)  
 Colorado River (North America)  
 Grand Canyon (AZ)  
 Phoenix (AZ)  
 Phoenix quadrangle (AZ)
- Arkansas**  
 GS nations  
 . United States  
 . . **Arkansas**
- arm (anatomy)**  
 GS anatomy  
 . limbs (anatomy)  
 . . **arm (anatomy)**  
 . . . elbow (anatomy)  
 . . . forearm  
 appendages  
 . **arm (anatomy)**  
 . . elbow (anatomy)  
 . . forearm  
 RT humerus  
 scapula  
 ulna  
 wrist
- ARMA (mathematics)*  
 (added October 1997)  
 USE **autoregressive moving average**
- armatures**  
 RT commutators  
 electric generators  
 electric motors  
 electric relays  
 induction motors  
 ∞ rotating electrical machines  
 rotors
- armed forces**  
 GS **armed forces**  
 . armed forces (foreign)  
 . armed forces (United States)  
 . navy  
 RT ∞ military aircraft  
 ∞ military aviation  
 military spacecraft  
 ∞ military vehicles  
 tanks (combat vehicles)
- armed forces (foreign)**  
 GS armed forces  
 . **armed forces (foreign)**  
 RT disarmament  
 enemy personnel  
 ∞ military aircraft  
 military technology  
 ∞ military vehicles  
 weapons
- armed forces (United States)**  
 GS armed forces  
 . **armed forces (United States)**  
 RT defense program  
 disarmament  
 ∞ military aircraft  
 military technology  
 ∞ military vehicles  
 weapons  
 weapons industry
- Armenia**  
 (added August 1993)  
 GS nations  
 . **Armenia**  
 RT Asia  
 Europe
- armor**  
 RT helmets  
 metal plates
- ordnance  
 protective clothing  
 shielding
- arms (robotics)*  
 USE **robot arms**
- Army-Navy instrumentation program**  
 GS programs  
 . **Army-Navy instrumentation program**  
 RT logistics  
 military technology
- AROD (range-orbit determination)*  
 USE **airborne range and orbit determination**
- ∞ **aromatic compounds**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 UF *aryl compounds*  
 RT ∞ chemical compounds  
 chloroaromatics  
 furfuryl alcohol  
 hydrocarbons  
 methylidyne  
 organic compounds  
 polycyclic aromatic hydrocarbons
- Aroos meteorite**  
 GS celestial bodies  
 . meteorites  
 . . iron meteorites  
 . . . **Aroos meteorite**
- arousal**  
 RT alertness  
 electroencephalography  
 ∞ stimuli
- ARPA computer network**  
 DEF The "Advanced Research Projects Agency" of the Department of Defense nationwide computer network incorporating digital communication between large numbers of dissimilar computers as well as direct access to programs, data, storage, etc. shared by all terminals.  
 GS networks  
 . communication networks  
 . . internets  
 . . . **ARPA computer network**  
 . computer networks  
 . . internets  
 . . . **ARPA computer network**  
 RT computer techniques  
 queueing theory  
 satellite communication  
 spacecraft communication  
 switching circuits  
 telecommunication  
 VSAT (network)
- ARQ (communication)*  
 USE **automatic repeat request**
- arrays**  
 GS **arrays**  
 . antenna arrays  
 . . linear arrays  
 . . . endfire arrays  
 . . . . Yagi antennas  
 . . . multispectral linear arrays  
 . . steerable antennas  
 . . . inertialess steerable antennas  
 . . turnstile antennas  
 . large aperture seismic array  
 . laser arrays  
 . multi-anode microchannel arrays  
 . phased arrays  
 . solar arrays  
 . . solar blankets  
 . synthetic arrays  
 . systolic arrays  
 RT antennas  
 focal plane devices  
 matrices (mathematics)  
 photomasks  
 pushbroom sensor modes
- ranking  
 ∞ statistics
- ∞ **arresters**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT arresting gear  
 blocking  
 brakes (for arresting motion)  
 gaps  
 lightning
- arresting gear**  
 GS landing aids  
 . **arresting gear**  
 safety devices  
 . **arresting gear**  
 RT abort apparatus  
 aircraft carriers  
 aircraft safety  
 antiskid devices  
 ∞ arresters  
 ∞ barriers  
 brakes (for arresting motion)  
 crash landing  
 ∞ gear
- arrhythmia**  
 DEF Absence of rhythm, as, for example, in heart beat.  
 GS rates (per time)  
 . heart rate  
 . . **arrhythmia**
- arrivals**  
 RT approach  
 landing
- arrow wings**  
 DEF Aircraft wings of V-shaped planform, either tapering or of constant chord, suggesting a stylized arrowhead.  
 GS airfoils  
 . wings  
 . . swept wings  
 . . . sweptback wings  
 . . . . **arrow wings**  
 planforms  
 . wing planforms  
 . . sweptback wings  
 . . . **arrow wings**  
 RT caret wings  
 delta wings  
 variable sweep wings
- arroyos**  
 GS landforms  
 . **arroyos**  
 RT canyons  
 drainage patterns  
 erosion  
 limnology  
 rain impact damage  
 water  
 water currents  
 water erosion
- arsenates**  
 GS arsenic compounds  
 . **arsenates**  
 RT arsenides  
 ∞ oxygen compounds
- arsenic**  
 GS chemical elements  
 . metalloids  
 . . **arsenic**  
 . . . arsenic isotopes  
 RT metals
- arsenic alloys**  
 GS alloys  
 . **arsenic alloys**  
 RT metalloids
- arsenic compounds**  
 GS **arsenic compounds**  
 . arsenates  
 . arsenides  
 . . aluminum arsenides



## arsenic isotopes

- . . . aluminum gallium arsenides
- . . . indium aluminum arsenides
- . . . gallium arsenides
- . . . aluminum gallium arsenides
- . . . indium gallium arsenides
- . . . indium arsenides
- . . . indium aluminum arsenides
- . . . indium gallium arsenides
- . . . proustite

RT ∞ chemical compounds  
∞ Group 5A compounds

### arsenic isotopes

GS chemical elements  
. metalloids  
. arsenic  
. . . **arsenic isotopes**  
. nuclides  
. isotopes  
. . . **arsenic isotopes**

RT metals  
radioactive isotopes

### arsenides

GS arsenic compounds  
. **arsenides**  
. . . aluminum arsenides  
. . . aluminum gallium arsenides  
. . . indium aluminum arsenides  
. . . gallium arsenides  
. . . aluminum gallium arsenides  
. . . indium gallium arsenides  
. . . indium arsenides  
. . . indium aluminum arsenides  
. . . indium gallium arsenides  
. . . proustite

RT arsenates  
intermetallics

### artemia

GS animals  
. invertebrates  
. . . arthropods  
. . . **artemia**

### arteries

GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . blood vessels  
. . . . **arteries**  
. . . . . aorta  
. . . . . arterioles

RT arteriosclerosis  
bifurcation (biology)  
carotid sinus body  
carotid sinus reflex  
phonoarteriography  
sphygmography  
veins

### arterioles

(added August 2004)  
DEF The smallest divisions of the arteries located between the muscular arteries and the capillaries.

GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . blood vessels  
. . . . arteries  
. . . . . **arterioles**

RT arteriosclerosis  
bifurcation (biology)  
capillaries (anatomy)

### arteriosclerosis

UF *atherosclerosis*  
GS diseases  
. **arteriosclerosis**

RT angina pectoris  
arteries  
arterioles  
cholesterol  
circulatory system  
coronary artery disease  
myocardial infarction

### arthritis

GS diseases

. **arthritis**

RT bones  
calcification  
joints (anatomy)  
rheumatic diseases

### arthropods

GS animals  
. invertebrates  
. . . **arthropods**  
. . . artemia  
. . . crabs  
. . . insects  
. . . . bees  
. . . . bollworms  
. . . . chironomus flies  
. . . . cockroaches  
. . . . Coleoptera  
. . . . beetles  
. . . . . tribolia  
. . . . . boll weevils  
. . . . crickets  
. . . . Drosophila  
. . . . fireflies  
. . . . grasshoppers  
. . . . locusts  
. . . . moths  
. . . . silkworms  
. . . spiders

RT exoskeletons  
larvae

### articulation (speech)

GS speech  
. **articulation (speech)**

RT languages  
speech defects

### artifacts

RT anthropology  
antiquities  
culture (social sciences)  
museums

### artificial cardiac pacemaker

GS medical equipment  
. **artificial cardiac pacemaker**

RT biotechnology  
blood circulation  
cardiology  
circulatory system  
heart  
heart conduction system  
pulmonary circulation

### artificial clouds

GS clouds (meteorology)  
. **artificial clouds**  
. . chemical clouds  
. . . barium ion clouds

RT weather modification

### artificial ears

GS medical equipment  
. prosthetic devices  
. . **artificial ears**

RT ear

### artificial gravity

DEF A simulated gravity established within a space vehicle by rotation or acceleration.

GS gravitation  
. **artificial gravity**

RT acceleration stresses (physiology)  
∞ astronautics  
environmental control  
gravity gradient satellites  
human centrifuges  
life support systems  
lower body negative pressure  
rotating environments  
spin dynamics  
weightlessness

### artificial harbors

GS waterways  
. harbors  
. . **artificial harbors**

RT cargo ships  
deepwater terminals

dredging  
marine technology  
oceanography  
offshore docking  
offshore platforms  
ship terminals  
tanker ships  
tanker terminals  
∞ tankers  
terminal facilities  
transportation

### artificial heart valves

GS medical equipment  
. **artificial heart valves**  
valves  
. heart valves  
. . **artificial heart valves**

RT biotechnology  
blood circulation  
blood pumps  
heart  
heart implantation

### artificial intelligence

DEF A discipline concerned with the development of computer and extended-robotic systems that can exhibit intelligent action. May also be defined as a subfield of computer science concerned with concepts and methods of symbolic inference by a computer and the symbolic representation of the knowledge to be used in making inferences.

UF *machine recognition*  
GS intelligence  
. **artificial intelligence**

RT automata theory  
backpropagation (artificial intelligence)  
belief networks  
bionics  
character recognition  
cognition  
computer vision  
computers  
decision support systems  
depersonalization  
expert systems  
genetic algorithms  
hypertext  
information processing (biology)  
intellect  
knowledge based systems  
knowledge bases (artificial intelligence)  
knowledge representation  
∞ logic  
logic programming  
machine learning  
natural language processing  
perception  
pilot support systems  
predicate calculus  
predicate logic  
Prolog (programming language)  
robotics  
robots  
self organizing systems  
theorem proving  
voice data processing

### artificial radiation belts

GS particles  
. charged particles  
. . magnetically trapped particles  
. . . radiation belts  
. . . . **artificial radiation belts**  
. . . . . corpuscular radiation  
. . radiation belts  
. . . **artificial radiation belts**  
. . trapped particles  
. . magnetically trapped particles  
. . . radiation belts  
. . . . **artificial radiation belts**

RT inner radiation belt  
nuclear explosions  
outer radiation belt

- ∞ radiation
- artificial respiration
- USE **resuscitation**
- artificial satellites**
- DEF Man-made satellites.
- GS **artificial satellites**
  - . active satellites
  - . . . SYNCOM satellites
  - . . . Early Bird satellites
  - . . . SYNCOM 1 satellite
  - . . . SYNCOM 2 satellite
  - . . . SYNCOM 3 satellite
  - . . . SYNCOM 4 satellite
  - . Alouette satellites
  - . . Alouette 1 satellite
  - . . Alouette 2 satellite
  - . . Alouette B satellite
  - . Arabsat
  - . Ariel satellites
  - . . Ariel 1 satellite
  - . . Ariel 2 satellite
  - . . Ariel 3 satellite
  - . . Ariel 4 satellite
  - . . Ariel 5 satellite
  - . BESS (satellite)
  - . biosatellites
  - . . Biosatellite 1
  - . . Biosatellite 2
  - . . Biosatellite 3
  - . . Orbiting Frog Otolith
  - . . Sputnik 2 satellite
  - . communication satellites
  - . . ACTS
  - . . aeronautical satellites
  - . . . Aerosat satellites
  - . . Arcomsat
  - . . Communications Technology Satellite
  - . . . ComStar C
  - . . . NATO 3B satellite
  - . . ComStar satellites
  - . . direct broadcast satellites
  - . . European Communications Satellite
  - . . Intelsat satellites
  - . . low frequency transionospheric satellites
  - . . L-Sat
  - . . Marecs maritime satellites
  - . . Marots (ESA)
  - . . Molniya satellites
  - . . MSAT
  - . . Palapa satellites
  - . . . Palapa 2 satellite
  - . . Raduga satellite
  - . . RCA Satcom satellites
  - . . Relay satellites
  - . . . Relay 1 satellite
  - . . . Relay 2 satellite
  - . . Symphonie satellites
  - . . SYNCOM satellites
  - . . . Early Bird satellites
  - . . . SYNCOM 1 satellite
  - . . . SYNCOM 2 satellite
  - . . . SYNCOM 3 satellite
  - . . . SYNCOM 4 satellite
  - . . TDR satellites
  - . . Westar satellites
  - . . COSPAS
  - . . Courier satellite
  - . . Diademe satellites
  - . . Discoverer satellites
  - . . Dodge satellite
  - . . EROS (satellites)
  - . . ESA satellites
  - . . . Aerosat satellites
  - . . . COS-B satellite
  - . . . ERS-1 (ESA satellite)
  - . . . ERS-2 (esa satellite)
  - . . . ESRO 1 satellite
  - . . . ESRO 2 satellite
  - . . . ESRO 4 satellite
  - . . European Communications Satellite
  - . . Exosat satellite
  - . . GEOS satellites (ESA)
  - . . HEOS satellites
  - . . . HEOS A satellite
  - . . . HEOS B satellite
  - . . Hipparcos satellite
  - . . Infrared Space Observatory (ISO)
  - . . L-Sat
  - . . Magellan ultraviolet astronomy satellite
  - . . Marecs maritime satellites
  - . . Marots (ESA)
  - . . METEOSAT satellite
  - . . OTS (ESA)
  - . . TD satellites
  - . . . TD-1 satellite
  - . . Envisat-1 satellite
  - . . XMM-Newton telescope
  - . . European 1 spacecraft
  - . . evasive satellites
  - . . French satellites
  - . . D-1 satellite
  - . . D-2 satellites
  - . . EOLE satellites
  - . . FR-1 satellite
  - . . GEOLE satellites
  - . . PEOLE satellites
  - . . Poseidon satellite
  - . . SPOT (French satellite)
  - . . SRET satellites
  - . . . SRET 1 satellite
  - . . . SRET 2 satellite
  - . . geodetic satellites
  - . . ANNA satellites
  - . . Explorer 29 satellite
  - . . Explorer 36 satellite
  - . . GEOLE satellites
  - . . GEOS 1 satellite
  - . . GEOS 2 satellite
  - . . GEOS 3 satellite
  - . . Geosat satellites
  - . . LARGOS satellite
  - . . PAGEOS satellite
  - . . Vanguard 1 satellite
  - . . geophysical satellites
  - . . Cosmos satellites
  - . . . Cosmos 2 satellite
  - . . . Cosmos 3 satellite
  - . . . Cosmos 5 satellite
  - . . . Cosmos 6 satellite
  - . . . Cosmos 14 satellite
  - . . . Cosmos 44 satellite
  - . . . Cosmos 54 satellite
  - . . . Cosmos 71 satellite
  - . . . Cosmos 110 satellite
  - . . . Cosmos 137 satellite
  - . . . Cosmos 144 satellite
  - . . . Cosmos 149 satellite
  - . . . Cosmos 166 satellite
  - . . . Cosmos 186 satellite
  - . . . Cosmos 188 satellite
  - . . . Cosmos 206 satellite
  - . . . Cosmos 213 satellite
  - . . . Cosmos 224 satellite
  - . . . Cosmos 225 satellite
  - . . . Cosmos 381 satellite
  - . . . Cosmos 954 satellite
  - . . . Cosmos 1129 satellite
  - . . Intercosmos satellites
  - . . Explorer 6 satellite
  - . . Explorer 10 satellite
  - . . Explorer 12 satellite
  - . . Explorer 45 satellite
  - . . OGO
  - . . . EGO
  - . . . OGO-3
  - . . . OGO-5
  - . . . OGO-A
  - . . . POGO
  - . . . . . OGO-4
  - . . . . . OGO-6
  - . . . . . OGO-C
  - . . OSO
  - . . . AOSO
  - . . . OSO-1
  - . . . OSO-2
  - . . . OSO-3
  - . . . OSO-4
  - . . . OSO-5
  - . . . OSO-6
  - . . . OSO-7
  - . . . OSO-8
  - . . . OSO-C
  - . . Polar/GGS spacecraft
  - . . Radiation and Meteoroid satellite
  - . . Sputnik 3 satellite
  - . . Vanguard 3 satellite
  - . . Wind/GGS spacecraft
  - . . GEOS-D satellite
  - . . gravity gradient satellites
  - . . . ATS
  - . . . . . ATS 1
  - . . . . . ATS 2
  - . . . . . ATS 3
  - . . . . . ATS 4
  - . . . . . ATS 5
  - . . . . . ATS 6
  - . . . . . ATS 7
  - . . . . . ATS 8
  - . . ORBIS CAL satellite
  - . . GREB satellites
  - . . Helios satellites
  - . . Helios 1
  - . . Helios 2
  - . . Helios A
  - . . Helios B
  - . . Injun satellites
  - . . Explorer 25 satellite
  - . . Injun 1 satellite
  - . . Injun 3 satellite
  - . . Injun 4 satellite
  - . . INMARSAT satellites
  - . . Inspector satellite
  - . . IRIS satellites
  - . . ISIS satellites
  - . . Alouette 2 satellite
  - . . ISIS-A
  - . . ISIS-B
  - . . ISIS-X
  - . . Landsat satellites
  - . . Landsat 1
  - . . Landsat 2
  - . . Landsat 3
  - . . Landsat 4
  - . . Landsat 5
  - . . Landsat 6
  - . . Landsat 7
  - . . Landsat E
  - . . Landsat F
  - . . Lincoln Experimental Satellites
  - . . lunar satellites
  - . . Explorer 18 satellite
  - . . Explorer 28 satellite
  - . . IMP
  - . . Lunar Orbiter
  - . . . Lunar Orbiter 1
  - . . . Lunar Orbiter 2
  - . . . Lunar Orbiter 3
  - . . . Lunar Orbiter 4
  - . . . Lunar Orbiter 5
  - . . LCROSS (satellite)
  - . . Lunar Prospector
  - . . Lunar Reconnaissance Orbiter
  - . . orbiting lunar stations
  - . . Mapsat
  - . . Marisat satellites
  - . . Marisat 1 satellite
  - . . maritime satellites
  - . . ERS-1 (ESA satellite)
  - . . Marecs maritime satellites
  - . . Marots (ESA)
  - . . meteorological satellites
  - . . AEROS satellite
  - . . Cosmos 144 satellite
  - . . D-2 satellites
  - . . DMSP satellites
  - . . Elektron satellites
  - . . . Elektron 1 satellite
  - . . . Elektron 2 satellite
  - . . . Elektron 4 satellite
  - . . EOLE satellites
  - . . ESSA satellites
  - . . . ESSA 1 satellite
  - . . . ESSA 2 satellite
  - . . . ESSA 3 satellite
  - . . . ESSA 4 satellite
  - . . . ESSA 5 satellite
  - . . . ESSA 6 satellite
  - . . . ESSA 7 satellite
  - . . . ESSA 8 satellite
  - . . . ESSA 9 satellite

artificial satellites

- .. Explorer 9 satellite
- .. Explorer 17 satellite
- .. Explorer 19 satellite
- .. GEOLE satellites
- .. GOES satellites
  - ... GOES 1
  - ... GOES 2
  - ... GOES 3
  - ... GOES 4
  - ... GOES 5
  - ... GOES 6
  - ... GOES 7
  - ... GOES 8
  - ... GOES 9
  - ... GOES 10
  - ... GOES 13
- .. METEOSAT satellite
- .. Nimbus satellites
  - ... Nimbus 1 satellite
  - ... Nimbus 2 satellite
  - ... Nimbus 3 satellite
  - ... Nimbus 4 satellite
  - ... Nimbus 5 satellite
  - ... Nimbus 6 satellite
  - ... Nimbus 7 satellite
- .. NOAA satellites
  - ... NOAA 2 satellite
  - ... NOAA 3 satellite
  - ... NOAA 4 satellite
  - ... NOAA 5 satellite
  - ... NOAA 6 satellite
  - ... NOAA 7 satellite
  - ... NOAA 8 satellite
  - ... NOAA 9 satellite
  - ... NOAA 10 satellite
  - ... NOAA 11 satellite
  - ... NOAA 12 satellite
  - ... NOAA 14 satellite
  - ... NOAA 19 satellite
- .. San Marco satellites
  - ... San Marco 1 satellite
  - ... San Marco 2 satellite
  - ... San Marco 3 satellite
- .. SEOCS (satellite)
- .. SIRS B satellite
- .. Sputnik 1 satellite
- .. Sputnik 2 satellite
- .. Sputnik 3 satellite
- .. SRET satellites
  - ... SRET 1 satellite
  - ... SRET 2 satellite
- .. Synchronous Earth Observatory satellite
  - ... SMS 1
  - ... SMS 2
- .. Synchronous Meteorological Satellite
  - ... SMS 1
  - ... SMS 2
- .. TIROS satellites
  - ... ITOS satellites
    - ... ITOS 1
    - ... ITOS 2
    - ... ITOS 3
    - ... ITOS 4
  - ... TIROS 1 satellite
  - ... TIROS 2 satellite
  - ... TIROS 3 satellite
  - ... TIROS 4 satellite
  - ... TIROS 5 satellite
  - ... TIROS 6 satellite
  - ... TIROS 7 satellite
  - ... TIROS 8 satellite
  - ... TIROS 9 satellite
  - ... TIROS 10 satellite
  - ... TIROS M
  - ... TIROS N series satellites
    - ... NOAA 6 satellite
- .. NPOESS
- .. TRMM satellite
- .. Vanguard 2 satellite
- .. Midas satellites
  - ... Midas 2 satellite
  - ... Midas 3 satellite
  - ... Midas 4 satellite
  - ... Midas 5 satellite
  - ... Midas 6 satellite
  - ... Midas 7 satellite
- .. Multispectral Resource Sampler
- .. navigation satellites
  - ... Aerosat satellites
  - ... Explorer 22 satellite
- .. navigation technology satellites
  - ... NAVSTAR satellites
- .. Nova satellites
- .. Refsat
- .. Transit Attitude Control satellite
- .. Transit satellites
- .. orbital workshops
  - ... Saturn workshops
    - ... Saturn 1 workshop
    - ... Saturn 5 workshop
  - ... Skylab 1
  - ... Skylab 2
  - ... Skylab 3
  - ... Skylab 4
- .. PAS
- .. passive satellites
  - ... Beacon satellites
    - ... Beacon Explorer A
  - ... Explorer 22 satellite
  - ... Echo satellites
    - ... Echo 1 satellite
    - ... Echo 2 satellite
  - ... LAGEOS (satellite)
  - ... PAGEOS satellite
  - ... Pegasus satellites
  - ... Polyot satellites
  - ... ROSAT mission
  - ... SAGE satellite
  - ... Samos
  - ... SarSat
- .. scientific satellites
  - ... AMPTE (satellites)
  - ... astronomical satellites
    - ... Astronomical Netherlands Satellite
      - ... Gamma Ray Observatory
      - ... Ginga satellite
    - ... HEAO
      - ... HEAO 1
      - ... HEAO 2
      - ... HEAO 3
      - ... HEAO 4
    - ... Hubble Space Telescope
    - ... Infrared Astronomy Satellite
    - ... Infrared Space Observatory (ISO)
    - ... IUE
    - ... Large Deployable Reflector
    - ... Magellan ultraviolet astronomy satellite
      - ... OAO
        - ... OAO 1
        - ... OAO 2
        - ... OAO 3
      - ... OSO
        - ... AOSO
        - ... OSO-1
        - ... OSO-2
        - ... OSO-3
        - ... OSO-4
        - ... OSO-5
        - ... OSO-6
        - ... OSO-7
        - ... OSO-8
        - ... OSO-C
      - ... Quasat
      - ... SAS
        - ... Explorer 53 satellite
        - ... SAS-1
        - ... SAS-2
        - ... SAS-3
      - ... Constellation-X
      - ... Fermi Gamma-ray Space Telescope
      - ... James Webb Space Telescope
      - ... Kepler mission
      - ... LISA (observatory)
      - ... Space Infrared Telescope Facility
      - ... Spartan satellites
      - ... Submillimeter Wave Astronomy Satellite
        - ... Swift observatory
        - ... Tenma satellite
        - ... Wide-field Infrared Survey Explorer
      - ... X Ray Astrophysics Facility
      - ... XMM-Newton telescope
- .. ATS
  - ... ATS 1
  - ... ATS 2
  - ... ATS 3
  - ... ATS 4
  - ... ATS 5
  - ... ATS 6
  - ... ATS 7
  - ... ATS 8
- .. Azur satellite
- .. Cannonball 2 satellite
- .. CRRES (satellite)
- .. DIAL satellite
- .. Environmental Research Satellites
  - ... ERS 17
  - ... ERS 18
- .. Intasat satellite
- .. EXOS satellites
  - ... EXOS-A satellite
  - ... EXOS-B satellite
  - ... EXOS-C satellite
  - ... EXOS-D satellite
- .. Exosat satellite
- .. Explorer satellites
  - ... Applications Explorer Satellites
  - ... Cosmic Background Explorer satellite
    - ... Dual Air Density Explorer
    - ... Dynamics Explorer satellites
      - ... Dynamics Explorer 1 satellite
      - ... Dynamics Explorer 2 satellite
    - ... Explorer 1 satellite
    - ... Explorer 2 satellite
    - ... Explorer 3 satellite
    - ... Explorer 4 satellite
    - ... Explorer 5 satellite
    - ... Explorer 6 satellite
    - ... Explorer 7 satellite
    - ... Explorer 8 satellite
    - ... Explorer 9 satellite
    - ... Explorer 10 satellite
    - ... Explorer 11 satellite
    - ... Explorer 12 satellite
    - ... Explorer 14 satellite
    - ... Explorer 15 satellite
    - ... Explorer 16 satellite
    - ... Explorer 17 satellite
    - ... Explorer 18 satellite
    - ... Explorer 19 satellite
    - ... Explorer 20 satellite
    - ... Explorer 21 satellite
    - ... Explorer 22 satellite
    - ... Explorer 23 satellite
    - ... Explorer 24 satellite
    - ... Explorer 25 satellite
    - ... Explorer 26 satellite
    - ... Explorer 27 satellite
    - ... Explorer 28 satellite
    - ... Explorer 29 satellite
    - ... Explorer 30 satellite
    - ... Explorer 31 satellite
    - ... Explorer 32 satellite
    - ... Explorer 33 satellite
    - ... Explorer 34 satellite
    - ... Explorer 35 satellite
    - ... Explorer 36 satellite
    - ... Explorer 37 satellite
    - ... Explorer 38 satellite
    - ... Explorer 39 satellite
    - ... Explorer 40 satellite
    - ... Explorer 41 satellite
    - ... Explorer 43 satellite
    - ... Explorer 44 satellite
    - ... Explorer 45 satellite
    - ... Explorer 46 satellite
    - ... Explorer 47 satellite
    - ... Explorer 48 satellite
    - ... Explorer 49 satellite
    - ... Explorer 50 satellite
    - ... Explorer 51 satellite
    - ... Explorer 52 satellite
    - ... Explorer 53 satellite
    - ... Explorer 54 satellite
    - ... Explorer 55 satellite
    - ... Extreme Ultraviolet Explorer satellite
    - ... Far UV Spectroscopic Explorer
    - ... IMP

- . . . International Magnetospheric Explorer
- . . . International Sun Earth Explorers
- . . . International Sun Earth Explorer 1
- . . . International Sun Earth Explorer 2
- . . . International Sun Earth Explorer 3
- . . . Advanced Composition Explorer
- . . . IMAGE satellite
- . . . Micrometeoroid Explorer satellites
- . . . Radio Astronomy Explorer satellite
- . . . Solar Mesosphere Explorer
- . . . Submillimeter Wave Astronomy Satellite
- . . . Transition Region and Coronal Explorer
- . . . Uhuru satellite
- . . . X Ray Timing Explorer
- . . . Geopotential Research Mission
- . . . Hawkeye satellites
- . . . Long Duration Exposure Facility
- . . . LZEEBE satellite
- . . . MagSat satellites
- . . . MagSat 1 satellite
- . . . Magsat A satellite
- . . . MagSat B satellite
- . . . ORBIS
- . . . ORBIS CAL satellite
- . . . OV-1 satellites
- . . . OV-2 satellites
- . . . OV-3 satellites
- . . . OV-4 satellites
- . . . OV-5 satellites
- . . . SCATHA satellite
- . . . small scientific satellites
- . . . Submillimeter Wave Astronomy Satellite
- . . . Transition Region and Coronal Explorer
- . . . UK satellites
- . . . Ariel 4 satellite
- . . . Ariel 5 satellite
- . . . Miranda satellite
- . . . UK 4 satellite
- . . . Aqua spacecraft
- . . . Aura spacecraft
- . . . CALIPSO (Pathfinder satellite)
- . . . CloudSat
- . . . Glory Mission satellite
- . . . Ice, Cloud and Land Elevation Satellite
- . . . Orbiting Carbon Observatory (OCO)
- . . . Polar/GGS spacecraft
- . . . QuikSCAT satellite
- . . . TRMM satellite
- . . . Upper Atmosphere Research Satellite (UARS)
- . . . Wind/GGS spacecraft
- . . . SCORE satellite
- . . . SEASAT satellites
- . . . SEASAT 1
- . . . SEASAT-B satellite
- . . . Shuttle pallet satellites
- . . . Skynet satellites
- . . . Snapshot satellite
- . . . solar power satellites
- . . . Solar Radiation 1 satellite
- . . . Solar Radiation 3 satellite
- . . . Soviet satellites
- . . . Cosmos 782 satellite
- . . . Cosmos 936 satellite
- . . . Cosmos satellites
- . . . Cosmos 2 satellite
- . . . Cosmos 3 satellite
- . . . Cosmos 5 satellite
- . . . Cosmos 6 satellite
- . . . Cosmos 14 satellite
- . . . Cosmos 44 satellite
- . . . Cosmos 54 satellite
- . . . Cosmos 71 satellite
- . . . Cosmos 110 satellite
- . . . Cosmos 137 satellite
- . . . Cosmos 144 satellite
- . . . Cosmos 149 satellite
- . . . Cosmos 166 satellite
- . . . Cosmos 186 satellite
- . . . Cosmos 188 satellite
- . . . Cosmos 206 satellite
- . . . Cosmos 213 satellite
- . . . Cosmos 224 satellite
- . . . Cosmos 225 satellite
- . . . Cosmos 381 satellite
- . . . Cosmos 954 satellite
- . . . Cosmos 1129 satellite
- . . . Intercosmos satellites
- . . . Granat satellite
- . . . Molniya satellites
- . . . Prognoz satellites
- . . . Proton satellites
- . . . Proton 1 satellite
- . . . Proton 2 satellite
- . . . Proton 3 satellite
- . . . Proton 4 satellite
- . . . Raduga satellite
- . . . Sputnik satellites
- . . . Sputnik 1 satellite
- . . . Sputnik 2 satellite
- . . . Sputnik 3 satellite
- . . . Sputnik 4 satellite
- . . . Sputnik 5 satellite
- . . . Venera satellites
- . . . Venera 2 satellite
- . . . Venera 3 satellite
- . . . Venera 4 satellite
- . . . Venera 5 satellite
- . . . Venera 6 satellite
- . . . Venera 7 satellite
- . . . Venera 8 satellite
- . . . Venera 9 satellite
- . . . Venera 10 satellite
- . . . Venera 11 satellite
- . . . Venera 12 satellite
- . . . space stations
- . . . Automatic Universal Orbiting Stations
- . . . Columbus space station
- . . . Halo Orbit space station
- . . . International Space Station
- . . . man tended free flyers
- . . . Mir space station
- . . . orbiting lunar stations
- . . . Salyut space station
- . . . Skylab 1
- . . . Skylab 2
- . . . Skylab 3
- . . . Skylab 4
- . . . Space Operations Center (NASA)
- . . . Space Station Freedom
- . . . space station polar platforms
- . . . synchronous satellites
- . . . AEROS satellite
- . . . Aerosat satellites
- . . . Anik satellites
- . . . Anik 1
- . . . Anik 2
- . . . Anik 3
- . . . GOES satellites
- . . . GOES 1
- . . . GOES 2
- . . . GOES 3
- . . . GOES 4
- . . . GOES 5
- . . . GOES 6
- . . . GOES 7
- . . . GOES 8
- . . . GOES 9
- . . . GOES 10
- . . . GOES 13
- . . . Miranda satellite
- . . . SIRIO satellite
- . . . StormSat satellite
- . . . Synchronous Earth Observatory satellite
- . . . SMS 1
- . . . SMS 2
- . . . Synchronous Meteorological Satellite
- . . . SMS 1
- . . . SMS 2
- . . . SYNCOM satellites
- . . . Early Bird satellites
- . . . SYNCOM 1 satellite
- . . . SYNCOM 2 satellite
- . . . SYNCOM 3 satellite
- . . . SYNCOM 4 satellite
- . . . TD satellites
- . . . TD-1 satellite
- . . . Telstar satellites
- . . . Telstar 1 satellite
- . . . Telstar 2 satellite
- . . . tethered satellites
- . . . Vanguard satellites
- . . . Vanguard 1 satellite
- . . . Vanguard 2 satellite
- . . . Vanguard 3 satellite
- . . . Engineering Test Satellites
- . . . microsattelites
- . . . nanosatellites
- . . . Terra spacecraft
- . . . Vela satellites
- RT flexible spacecraft
- inflatable spacecraft
- interplanetary spacecraft
- lunar orbits
- lunar spacecraft
- maneuverable spacecraft
- manned spacecraft
- military spacecraft
- National Oceanic Satellite System
- natural satellites
- observatories
- orbits
- reconnaissance spacecraft
- satellite sounding
- ∞ satellites
- space capsules
- space laboratories
- Telstar project
- unmanned spacecraft
- artillery**
- GS weapons
- . guns (ordnance)
- . . **artillery**
- . . . howitzers
- . . . precision guided projectiles
- RT gun launchers
- gunnery training
- missiles
- rifles
- Sabot projectiles
- artillery fire**
- RT ∞ barrages
- gunfire
- arts**
- GS **arts**
- . graphic arts
- . . animation
- . . . computer animation
- RT creativity
- music
- Aryabhata*
- USE **Indian spacecraft**
- aryl compounds*
- USE **aromatic compounds**
- ASA
- USE **acetylsalicylic acid**
- asbestos**
- GS minerals
- . **asbestos**
- RT Amberlite (trademark)
- electrical insulation
- insulation
- nonflammable materials
- serpentine
- thermal insulation
- ascent**
- GS **ascent**
- . climbing flight
- RT balloons
- descent
- Lunar Module Ascent Stage
- takeoff
- ascent propulsion systems**
- GS propulsion
- . **ascent propulsion systems**

## ascent trajectories

propulsion system configurations  
 . **ascent propulsion systems**  
 RT Lunar Module  
 missiles  
 propellants  
 rocket propellants  
 space flight  
 Space Shuttle Ascent Stage  
 ∞ systems

### ascent trajectories

GS trajectories  
 . **ascent trajectories**  
 RT ballistic trajectories  
 climbing flight  
 coasting flight  
 descent trajectories  
 flight mechanics  
 guidance (motion)  
 injection guidance  
 lofting  
 Lunar Module Ascent Stage  
 midcourse trajectories  
 missile trajectories  
 orbit insertion  
 parabolic flight  
 post boost propulsion system  
 rendezvous trajectories  
 spacecraft trajectories

### ascorbic acid

UF *vitamin C*  
 GS acids  
 . **ascorbic acid**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . **ascorbic acid**  
 vitamins  
 . **ascorbic acid**

### ascorbic acid metabolism

GS metabolism  
 . **ascorbic acid metabolism**  
 RT vitamins

### ASCR reactor

USE **advanced sodium cooled reactor**

### ASDE

USE **airport surface detection equipment**

### ASE (aerodynamics)

USE **aeroservoelasticity**

### ashes

GS **ashes**  
 . fly ash  
 RT air pollution  
 coal  
 combustion products  
 cultivation  
 fertilizers  
 fire damage  
 forest fires  
 lignite  
 reaction products  
 residues

### Asia

GS continents  
 . **Asia**  
 RT Afghanistan  
 Armenia  
 Azerbaijan  
 Bangladesh  
 Brunei  
 Burma  
 Cambodia  
 China  
 Commonwealth of Independent States  
 Georgia (Eurasia)  
 Himalayas  
 Hong Kong  
 India  
 Iran  
 Iraq  
 Israel

Japan  
 Kazakhstan  
 Kuwait  
 Kyrgyzstan  
 Laos  
 Lebanon  
 Malaysia  
 Middle East  
 Mongolia  
 nations  
 Nepal  
 North Korea  
 Pakistan  
 Papua New Guinea  
 Qatar  
 Red Sea  
 Russian Federation  
 Saudi Arabia  
 Sea of Japan  
 Siberia  
 Sikkim  
 Singapore  
 South Korea  
 Southeast Asia  
 Southern Yemen  
 Sri Lanka  
 Syria  
 Taiwan  
 Tajikistan  
 Thailand  
 Tibet  
 tundra  
 Turkmenistan  
 U.S.S.R.  
 Uzbekistan  
 Vietnam  
 Yemen

### ASIC

USE **application specific integrated circuits**

### aspartates

GS biopolymers  
 . proteins  
 . . **aspartates**  
 esters  
 . **aspartates**  
 organic compounds  
 . proteins  
 . . **aspartates**  
 RT amino acids  
 aspartic acid

### aspartic acid

GS acids  
 . amino acids  
 . . **aspartic acid**  
 . carboxylic acids  
 . . **aspartic acid**  
 organic compounds  
 . amino acids  
 . . **aspartic acid**  
 . carboxylic acids  
 . . **aspartic acid**  
 RT aspartates  
 peptides

### aspect ratio

DEF In general, the ratio of one dimension to another. In aeronautics, the ratio of the square of the span of an airfoil to the total airfoil area, or the ratio of its span to its mean chord.

UF *slenderness ratio*  
 GS ratios

#### . **aspect ratio**

. . fineness ratio  
 . . high aspect ratio  
 . . low aspect ratio  
 . . thickness ratio

RT aerodynamic characteristics  
 airfoils  
 dimensional analysis  
 dimensional stability  
 lift  
 ∞ span  
 structural stability

wings

### Aspergillus

GS plants (botany)  
 . fungi  
 . . **Aspergillus**  
 RT infectious diseases  
 ∞ mold

### asphalt

DEF A dark brown to black cementitious material, in which the predominating constituents are bitumens which occur in nature or are obtained in petroleum processing.

GS products  
 . petroleum products  
 . . **asphalt**  
 RT amorphous materials  
 pavements  
 pitch (material)  
 tars

### asphaltenes

DEF Components of bitumens that are soluble in carbon disulphide but not in paraffin naphtha, constitute the solid dispersed particles of the bitumens, and consist of high molecular weight hydrocarbons.

RT coal  
 coal derived liquids  
 coal liquefaction  
 hydrogenation

### aspheres

USE **aspheric optics**

### aspheric optics

(added June 1995)

DEF Lenses whose surfaces are custom tuned to specific applications, thereby correcting aberrations in an optical system.

UF *aspheres*  
*asymmetrical optics*  
*nonspherical optics*

GS lenses  
 . **aspheric optics**  
 RT asphericity  
 laser fusion  
 lens design  
 optical materials  
 ∞ optics

### asphericity

RT aberration  
 aspheric optics  
 geometrical optics  
 ∞ optics  
 refraction  
 spheres

### asphyxia

RT anoxia  
 respiration  
 signs and symptoms

### aspiration

USE **vacuum**

### ASRM (STS)

USE **Advanced Solid Rocket Motor (STS)**

### ASROC engine

GS engines  
 . rocket engines  
 . . solid propellant rocket engines  
 . . . **ASROC engine**  
 RT antisubmarine warfare  
 torpedoes

### Assateague Island (MD-VA)

GS landforms  
 . islands  
 . . **Assateague Island (MD-VA)**  
 RT Atlantic Ocean  
 Maryland

- Virginia
- RT space shuttles
- ∞ processing
- assaulting*
- USE **attacking (assaulting)**
- assaying**
- RT chemical analysis  
immunoassay  
lab-on-a-chip devices  
Mars surface samples  
particulate sampling  
radioimmunoassay  
sampling
- assembler routines**
- GS computer programming  
. **assembler routines**  
computer programs  
. computer systems programs  
. . **assembler routines**
- RT compilers  
disk operating system (DOS)  
operating systems (computers)
- assemblies**
- GS **assemblies**  
. subassemblies  
. tail assemblies  
. . horizontal tail surfaces  
. . sweptback tail surfaces  
. . swing tail assemblies  
. . T tail surfaces  
. . trapezoidal tail surfaces
- RT accumulations  
assembling  
∞ assembly  
collocation  
∞ components  
fabrication  
mosaics  
strings
- assembling**
- GS **assembling**  
. orbital assembly  
. self assembly
- RT assemblies  
∞ assembly  
∞ attachment  
clean rooms  
collection  
construction  
fabrication  
fitting  
installing  
∞ joining  
mounting  
preparation  
rigging  
space manufacturing
- ∞ **assembly**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT assemblies  
assembling  
collocation  
self assembly
- Assembly language**
- GS languages  
. programming languages  
. . **Assembly language**  
. . . autocoders  
. . . COMPASS (programming language)  
. . . MAP (programming language)
- RT computer programming  
computer programs  
computer systems programs  
machine oriented languages
- Assess program**
- UF *Spacelab simulation flights*
- GS programs  
. NASA programs  
. . **Assess program**
- assessments**
- GS **assessments**  
. damage assessment  
. risk assessment  
. technology assessment
- RT evaluation  
pilot ratings  
ratings  
revenue  
value
- ASSET gliders**
- GS gliders  
. **ASSET gliders**
- RT ∞ aircraft  
hypersonic gliders  
lifting reentry vehicles
- ASSET project**
- GS programs  
. projects  
. . **ASSET project**
- RT aerothermodynamics  
environmental tests
- assignment*
- USE **allocations**
- assimilation**
- RT dispersing  
distributing  
∞ distribution  
material absorption
- association reactions**
- DEF Gas phase chemical processes in which two molecular species A and B react to form a larger molecule AB. In astrophysics these processes are involved in the "condensation" of small gaseous molecules into larger species.
- GS chemical reactions  
. **association reactions**  
gas-gas interactions  
. **association reactions**
- RT astrophysics  
chemical equilibrium  
condensing  
endothermic reactions  
exothermic reactions  
interstellar chemistry  
molecular gases  
molecular interactions  
oxidation  
photochemical reactions  
photooxidation  
reaction kinetics  
vapor phases
- associations*
- USE **organizations**
- associative memory**
- (*added December 1999*)
- DEF A method or device for data storage in which data is identified by a part or properties of its content, rather than by an address or relative position.
- UF *associative storage*  
*content-addressable memory*
- GS memory (computers)  
. **associative memory**
- RT associative processing (computers)  
computer storage devices  
neural nets  
optical memory (data storage)
- associative processing (computers)**
- DEF Byte-variable computer processing with multifield search, arithmetic, and logic capability.
- GS data processing  
. **associative processing (computers)**
- RT associative memory  
digital computers  
multiprocessing (computers)  
parallel processing (computers)  
pipelining (computers)
- associative storage*
- (*added December 1999*)
- USE **associative memory**
- assumptions**
- RT hypotheses  
inference  
risk  
simplification  
∞ theories
- assurance**
- RT insurance (contracts)  
quality control  
redundancy  
reliability
- Assured Crew Return Vehicle**
- (*added September 1995*)
- DEF An aerospace vehicle designed to return space station crews to Earth quickly (less than 24 hours) in the event of crew illness/injury, space station catastrophe/failure, or transportation element catastrophe/failure.
- UF *ACRV*
- GS recovery vehicles  
. **Assured Crew Return Vehicle**
- RT emergency life sustaining systems  
escape capsules  
International Space Station  
lifeboats  
rescue operations  
return to Earth space flight  
safety management  
Soyuz spacecraft  
survival equipment  
X-38 crew return vehicle
- astatine**
- GS chemical elements  
. halogens  
. . **astatine**  
metals  
. **astatine**
- astatine isotopes**
- GS chemical elements  
. nuclides  
. . isotopes  
. . . radioactive isotopes  
. . . . **astatine isotopes**  
metals  
. **astatine isotopes**
- ASTEC solar turboelectric generator**
- GS auxiliary power sources  
. solar auxiliary power units  
. . **ASTEC solar turboelectric generator**  
electric generators  
. rotating generators  
. . turbogenerators  
. . . **ASTEC solar turboelectric generator**  
solar generators  
. solar auxiliary power units  
. . . **ASTEC solar turboelectric generator**  
turbomachinery  
. turbogenerators  
. . **ASTEC solar turboelectric generator**
- RT Rankine cycle  
sun  
thermoelectric generators
- asteroid belts**
- DEF The location of the orbits of most of the minor planets (estimated at a half million asteroids) between Mars and Jupiter; about 2000 asteroids have been assigned numbers and names.
- GS celestial bodies  
. **asteroid belts**  
. . Toro asteroid
- RT Amor asteroid  
Amphitrite asteroid  
Apollo asteroids

## asteroid capture

- asteroid collisions
- asteroids
- ∞ belts
  - Ceres asteroid
- Chiron
- Gaspra asteroid
- Icarus asteroid
- Ida asteroid
- meteorite parent bodies
- meteoroids
- Quaoar
- regions
- solar system
- space debris
- Toutatis asteroid
- Vesta asteroid

### asteroid capture

DEF The transfer of an asteroid or comet from the influence of a planet into that of another planet or neutral satellite.

RT asteroids  
celestial bodies  
containment  
enclosures  
payloads  
retaining  
solar system

### asteroid collisions

(added July 1997)

GS collisions

- . **asteroid collisions**

RT asteroid belts  
asteroid detection  
cometary collisions  
craters  
Earth (planet)  
hypervelocity impact  
meteorite collisions  
near Earth objects

### asteroid detection

(added July 1997)

GS detection

- . **asteroid detection**

RT asteroid collisions  
asteroids  
sky surveys (astronomy)  
space observations (from Earth)  
space surveillance (ground based)  
stellar occultation

### asteroid missions

DEF Space missions for the study of asteroids and related celestial bodies.

GS space missions

- . **asteroid missions**
- .. Comet Rendezvous Asteroid Flyby Mission
- .. Near Earth Asteroid Rendezvous Mission
- .. Rosetta mission

RT asteroids  
Clementine spacecraft  
Deep Space 1 Mission  
flyby missions  
interplanetary flight

∞ missions  
New Horizons mission  
space exploration

### asteroids

DEF Small celestial bodies revolving around the sun, most having orbits between those of Mars and Jupiter.

UF *minor planets*  
GS celestial bodies

- . **asteroids**
- .. Amor asteroid
- .. Amphitrite asteroid
- .. Apollo asteroids
- .. Ceres asteroid
- .. Chiron
- .. EROS asteroid
- .. Gaspra asteroid
- .. Icarus asteroid
- .. Ida asteroid
- .. Quaoar
- .. Toro asteroid

.. Toutatis asteroid  
.. Trojan asteroids  
.. Vesta asteroid

RT asteroid belts  
asteroid capture  
asteroid detection  
asteroid missions  
dwarf planets  
Kuiper belt  
meteorite parent bodies  
meteoroids  
near Earth objects  
solar system  
space debris  
trans-Neptunian objects

### asteroseismology

(added March 2001)

DEF Study of stellar oscillations as a means to probing the internal structure and dynamics of stars.

UF *stellar seismology*  
GS seismology

- . **asteroseismology**
- .. helioseismology

RT astrometry  
astronomical photometry  
astrophysics  
starquakes  
stellar evolution  
stellar interiors  
stellar oscillations  
stellar physics

### asthenopia

GS diseases

- . eye diseases
- .. **asthenopia**

RT fatigue (biology)

### asthenosphere

(added August 1994)

DEF Layer or shell of the Earth below the lithosphere which is weak and in which isostatic adjustments take place, magmas may be generated, and seismic waves are strongly attenuated.

RT boundary layers  
Earth mantle  
Earth planetary structure  
lithosphere  
planetary structure  
seismology  
tectonics

### asthma

GS diseases

- . respiratory diseases
- .. **asthma**

### astigmatism

DEF A defect of an optical system in consequence of which rays from a point fail to meet in a focal point resulting in a blurred and imperfect image.

GS diseases

- . eye diseases
- .. **astigmatism**

RT distortion  
focusing  
geometrical optics  
haplosopes  
lenses

∞ optics  
refraction  
stigmatism

### ASTP

USE **Apollo Soyuz test project**

### astrionics

DEF Astronautical electronics, particularly the development and use of electronic equipment and systems for space vehicles and platforms.

RT ∞ astronautics  
avionics  
∞ control  
∞ electronics  
guidance (motion)

satellite communication  
single event upsets  
spacecraft communication  
spacecraft electronic equipment  
spacecraft instruments

∞ test equipment

### Astro missions (STS)

GS payloads

- . Space Shuttle payloads
- .. **Astro missions (STS)**

RT ∞ missions  
spaceborne astronomy  
spaceborne telescopes  
Spacelab payloads

### Astro vehicle

SN (EXCLUDES STS)  
GS maneuverable spacecraft

- . **Astro vehicle**
- .. manned spacecraft
- .. **Astro vehicle**
- .. reentry vehicles
- .. recoverable spacecraft
- .. **Astro vehicle**
- .. soft landing spacecraft
- .. **Astro vehicle**

RT aerospace planes  
boostglide vehicles  
ferry spacecraft  
lifting reentry vehicles

∞ spacecraft

### Astrobee 1500 rocket vehicle

GS rocket vehicles

- . multistage rocket vehicles
- .. Astrobee rocket vehicles
- ... **Astrobee 1500 rocket vehicle**
- .. sounding rockets
- .. Astrobee rocket vehicles
- ... **Astrobee 1500 rocket vehicle**

RT solid propellant rocket engines

### Astrobee rocket vehicles

GS rocket vehicles

- . multistage rocket vehicles
- .. **Astrobee rocket vehicles**
- .. Astrobee 1500 rocket vehicle
- .. sounding rockets
- .. **Astrobee rocket vehicles**
- .. Astrobee 1500 rocket vehicle

RT Genie rocket vehicle  
solid propellant rocket engines

∞ vehicles

### astrobiology

USE **exobiology**

### astrodynamics

DEF The practical application of celestial mechanics, astrobballistics, propulsion theory, and allied fields to the problem of planning and directing the trajectories of space vehicles.

GS mechanics (physics)

- . classical mechanics
- .. space mechanics
- ... **astrodynamics**

RT ∞ astronautics  
astronomical observatories  
celestial bodies  
celestial mechanics

∞ dynamics  
interplanetary flight  
orbital mechanics  
orbital resonances (celestial mechanics)

∞ science  
space exploration  
space flight  
space navigation

∞ spacecraft  
trajectory analysis

### astrography

SN (EXCLUDES ASTRONOMICAL PHOTOGRAPHY)  
RT astronomical maps  
mapping

planetary mapping

**Astroguide Navigation System**

- GS navigation
  - . celestial navigation
  - . . **Astroguide Navigation System**
  - . inertial navigation
  - . . **Astroguide Navigation System**
- RT inertial coordinates
  - star trackers
- ∞ systems

**astrolabes**

- DEF Instruments designed to observe the positions and measure the altitudes of celestial bodies.
- GS measuring instruments
  - . indicating instruments
  - . . **astrolabes**
- RT altimeters
  - astrometry
  - astronomical observatories
  - astronomy
  - celestial bodies
  - position (location)
  - position errors
  - solar position
  - star distribution
  - star trackers
  - stars

**Astroloy (trademark)**

- GS alloys
  - . chromium alloys
  - . . **Astroloy (trademark)**
  - . cobalt alloys
  - . . **Astroloy (trademark)**
  - . high strength alloys
  - . . **Astroloy (trademark)**
  - . nickel alloys
  - . . **Astroloy (trademark)**
  - . ternary alloys
  - . . **Astroloy (trademark)**

*astromasts*

USE **longerons**

**astrometry**

- RT asteroseismology
  - astrolabes
  - astronomical maps
  - astronomical photography
  - astronomical polarimetry
  - astronomy
  - double stars
  - Hipparcos satellite
- ∞ measurement
  - parallax
  - planet detection
  - proper motion
  - solar diameter
  - stellar parallax

**Astron thermonuclear reactor**

- GS nuclear reactors
  - . **Astron thermonuclear reactor**
- RT relativistic plasmas
  - thermonuclear power generation
  - thermonuclear reactions

**astronaut locomotion**

- GS locomotion
  - . **astronaut locomotion**
- RT extravehicular activity
  - extravehicular mobility units
  - intravehicular activity
  - life support systems
  - man operated propulsion systems
  - manned maneuvering units
  - orbital workers

**astronaut maneuvering equipment**

- GS **astronaut maneuvering equipment**
  - . manned maneuvering units
- RT Crew Equipment Translation Aid (ISS)
  - extravehicular activity
  - extravehicular mobility units
  - human factors engineering
  - IMLSS
  - intravehicular activity

self maneuvering units  
walking machines

**astronaut performance**

- GS human performance
  - . **astronaut performance**
  - . . blackout prevention
- RT confinement
  - confining
  - human factors engineering
  - intravehicular activity
  - man machine systems
  - operator performance
- ∞ performance
  - physiological factors
  - pilot performance
  - psychological factors
  - space psychology
  - spacecraft performance
  - weightlessness

**astronaut training**

- GS education
  - . flight training
  - . . space flight training
  - . . . **astronaut training**
  - learning
  - . **astronaut training**
- RT ejection training
  - pilot training
  - space maintenance
  - space psychology
  - training simulators

∞ **astronautics**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The science of space flight including the design, construction, and operation of spacecraft.
- RT aerospace environments
  - artificial gravity
  - astrionics
  - astrodynamics
  - astronauts
  - astronomy
  - auxiliary propulsion
  - avionics
  - bioastronautics
  - Biosatellite 3
  - cosmonauts
  - Earth-Venus trajectories
  - human factors engineering
  - lunar bases
  - propulsion
  - soft landing
  - space exploration
  - space flight
  - space maintenance
  - space navigation
  - spacecraft docking
  - weightlessness

**astronauts**

- GS personnel
  - . flying personnel
  - . . **astronauts**
  - . . . orbital workers
- RT ∞ astronautics
  - awards
  - cosmonauts
  - crew experiment stations
  - crew observation stations
  - crew workstations
  - crews
  - pilots (personnel)
  - spacecrews

**astronavigation**

- GS navigation
  - . celestial navigation
  - . . **astronavigation**
- RT air navigation
  - interplanetary navigation
  - interstellar travel
  - radio navigation
  - space navigation

**astronomical catalogs**

UF *star catalogs*

- GS documents
  - . catalogs (publications)
  - . . **astronomical catalogs**
- RT ∞ catalogs
  - classifications
  - ephemerides
  - northern sky
  - sky surveys (astronomy)
  - Southern sky
  - tables (data)

**astronomical coordinates**

- DEF Coordinates defining a point on the surface of the Earth, or of the geoid, in which the local direction of gravity is used as a reference.
- GS coordinates
  - . **astronomical coordinates**
- RT azimuth
  - celestial reference systems
  - cylindrical coordinates
  - geocentric coordinates
  - northern sky
  - planetocentric coordinates
  - planispheres
  - polar coordinates
  - proper motion
  - reference stars
  - solar longitude
  - spherical coordinates

**astronomical interferometry**

(added June 1993)

- GS interferometry
  - . **astronomical interferometry**
- RT astronomy
  - etalons
  - infrared interferometers
  - interferometers
  - LIGO (observatory)
  - LISA (observatory)
  - planet detection
  - radio astronomy
  - Sagnac effect
  - space observations (from Earth)
  - spaceborne astronomy
  - very long base interferometry

**astronomical maps**

- GS maps
  - . **astronomical maps**
  - . . planispheres
- RT astrography
  - astrometry
  - celestial reference systems
  - celestial sphere
  - lunar maps

**astronomical models**

- UF *orreries*
- GS models
  - . **astronomical models**
  - . . density wave model
  - . . stellar models
- RT big bang cosmology
  - corotation
  - cosmology
  - Earth analogs
  - mathematical models
  - molecular clouds
  - planetariums
  - Reissner-Nordstrom solution
  - solar neutrinos
  - solar oscillations
  - stellar oscillations

**Astronomical Netherlands Satellite**

- UF *ANS*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . **Astronomical Netherlands Satellite**
  - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . **Astronomical Netherlands Satellite**
- RT Netherlands



# astronomical observatories

Netherlands space program

## astronomical observatories

- GS observatories
  - . **astronomical observatories**
  - . . . astronomical satellites
  - . . . Astronomical Netherlands Satellite
  - . . . Gamma Ray Observatory
  - . . . Ginga satellite
  - . . . HEAO
  - . . . . HEAO 1
  - . . . . HEAO 2
  - . . . . HEAO 3
  - . . . . HEAO 4
  - . . . Hubble Space Telescope
  - . . . Infrared Astronomy Satellite
  - . . . Infrared Space Observatory (ISO)
  - . . . IUE
  - . . . Large Deployable Reflector
  - . . . Magellan ultraviolet astronomy satellite
  - . . . OAO
  - . . . . OAO 1
  - . . . . OAO 2
  - . . . . OAO 3
  - . . . OSO
  - . . . . AOSO
  - . . . . OSO-1
  - . . . . OSO-2
  - . . . . OSO-3
  - . . . . OSO-4
  - . . . . OSO-5
  - . . . . OSO-6
  - . . . . OSO-7
  - . . . . OSO-8
  - . . . . OSO-C
  - . . . Quasat
  - . . . SAS
  - . . . . Explorer 53 satellite
  - . . . . SAS-1
  - . . . . SAS-2
  - . . . . SAS-3
  - . . . Constellation-X
  - . . . Fermi Gamma-ray Space Telescope
  - . . . James Webb Space Telescope
  - . . . Kepler mission
  - . . . LISA (observatory)
  - . . . Space Infrared Telescope Facility
  - . . . Spartan satellites
  - . . . Submillimeter Wave Astronomy Satellite
  - . . . Swift observatory
  - . . . Tenma satellite
  - . . . Wide-field Infrared Survey Explorer
  - . . . X Ray Astrophysics Facility
  - . . . XMM-Newton telescope
  - . . . Astrolane
  - . . . ROSAT mission
  - . . . SOFIA (airborne observatory)
  - . . . solar observatories
  - . . . OSO
  - . . . . AOSO
  - . . . . OSO-1
  - . . . . OSO-2
  - . . . . OSO-3
  - . . . . OSO-4
  - . . . . OSO-5
  - . . . . OSO-6
  - . . . . OSO-7
  - . . . . OSO-8
  - . . . . OSO-C
  - . . . Pinhole Occulter Facility
  - . . . STEREO (observatory)
  - . . . European Southern Observatory
  - . . . LIGO (observatory)
- RT astrodynamics
- astrolabes
- astronomy
- celestial bodies
- geophysical observatories
- honeycomb mirrors
- Jodrell Bank Observatory
- lunar observatories
- Next Generation Space Telescope project
- northern sky

- observation scheduling
- radio astronomy
- seeing (astronomy)
- segmented mirrors
- Southern sky
- spaceborne telescopes
- telescopes

## astronomical photography

- GS imagery
- . photography
- . . **astronomical photography**
- RT aerial photography
- astrometry
- astronomy
- atmospheric windows
- Baker-Nunn camera
- black and white photography
- coronagraphs
- diffraction limited cameras
- electro-optical photography
- faint object camera
- infrared astronomy
- infrared photography
- Lallemand cameras
- lunar photographs
- lunar photography
- reference stars
- rocket-borne photography
- satellite-borne photography
- Schmidt cameras
- Southern sky
- spaceborne photography
- spaceborne telescopes

## astronomical photometry

- GS optical measurement
- . photometry
- . . **astronomical photometry**
- . . . stellar spectrophotometry
- RT asteroseismology
- atmospheric windows
- blinking
- cometary atmospheres
- DIAL satellite
- infrared photometry
- Kepler mission
- planet detection
- spectrophotometry
- superhumps (astronomy)
- telephotometry

## astronomical polarimetry

- (added July 1991)
- DEF The measurement of electromagnetic radiation from celestial bodies by polarimeters.
- GS optical measurement
- . polarimetry
- . . **astronomical polarimetry**
- RT astrometry
- astronomy
- polarimeters

## astronomical satellites

- GS artificial satellites
- . scientific satellites
- . . **astronomical satellites**
- . . . Astronomical Netherlands Satellite
- . . . Gamma Ray Observatory
- . . . Ginga satellite
- . . . HEAO
- . . . . HEAO 1
- . . . . HEAO 2
- . . . . HEAO 3
- . . . . HEAO 4
- . . . Hubble Space Telescope
- . . . Infrared Astronomy Satellite
- . . . Infrared Space Observatory (ISO)
- . . . IUE
- . . . Large Deployable Reflector
- . . . Magellan ultraviolet astronomy satellite
- . . . OAO
- . . . . OAO 1
- . . . . OAO 2
- . . . . OAO 3
- . . . OSO
- . . . . AOSO
- . . . . OSO-1

- . . . OSO-2
- . . . OSO-3
- . . . OSO-4
- . . . OSO-5
- . . . OSO-6
- . . . OSO-7
- . . . OSO-8
- . . . OSO-C
- . . . Quasat
- . . . SAS
- . . . . Explorer 53 satellite
- . . . SAS-1
- . . . SAS-2
- . . . SAS-3
- . . . Constellation-X
- . . . Fermi Gamma-ray Space Telescope
- . . . James Webb Space Telescope
- . . . Kepler mission
- . . . LISA (observatory)
- . . . Space Infrared Telescope Facility
- . . . Spartan satellites
- . . . Submillimeter Wave Astronomy Satellite
- . . . Swift observatory
- . . . Tenma satellite
- . . . Wide-field Infrared Survey Explorer
- . . . X Ray Astrophysics Facility
- . . . XMM-Newton telescope
- observatories
- . astronomical observatories
- . . **astronomical satellites**
- . . . Astronomical Netherlands Satellite
- . . . Gamma Ray Observatory
- . . . Ginga satellite
- . . . HEAO
- . . . . HEAO 1
- . . . . HEAO 2
- . . . . HEAO 3
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- . . . . OAO 3
- . . . OSO
- . . . . AOSO
- . . . . OSO-1
- . . . . OSO-2
- . . . . OSO-3
- . . . . OSO-4
- . . . . OSO-5
- . . . . OSO-6
- . . . . OSO-7
- . . . . OSO-8
- . . . . OSO-C
- . . . Quasat
- . . . SAS
- . . . . Explorer 53 satellite
- . . . SAS-1
- . . . SAS-2
- . . . SAS-3
- . . . Constellation-X
- . . . Fermi Gamma-ray Space Telescope
- . . . James Webb Space Telescope
- . . . Kepler mission
- . . . LISA (observatory)
- . . . Space Infrared Telescope Facility
- . . . Spartan satellites
- . . . Submillimeter Wave Astronomy Satellite
- . . . Swift observatory
- . . . Tenma satellite
- . . . Wide-field Infrared Survey Explorer
- . . . X Ray Astrophysics Facility
- . . . XMM-Newton telescope
- RT ROSAT mission

- spaceborne astronomy
- astronomical spectroscopy**  
 GS spectroscopy  
 . **astronomical spectroscopy**  
 . . stellar spectrophotometry  
 RT astronomy  
 blue shift  
 continuous spectra  
 electromagnetic spectra  
 infrared spectroscopy  
 Kuiper Airborne Observatory  
 laboratory astrophysics  
 organic solids  
 radial velocity  
 radiation spectra  
 radio astronomy  
 radio spectroscopy  
 Raman spectroscopy  
 solar spectra  
 Southern sky  
 spectra  
 spectroscopic telescopes  
 stellar spectra  
 ultraviolet spectroscopy  
 visible spectrum  
 x ray spectroscopy
- astronomical telescopes*  
 USE **telescopes**
- astronomy**  
 DEF The science that treats of the location, magnitudes, motions, and constitution of celestial bodies and structures. Used for celestial observation.  
 UF *celestial observation*  
 GS **astronomy**  
 . gamma ray astronomy  
 . infrared astronomy  
 . radar astronomy  
 . radio astronomy  
 . spaceborne astronomy  
 . ultraviolet astronomy  
 . x ray astronomy  
 RT ∞ aerospace sciences  
 Amor asteroid  
 Apollo asteroids  
 astrolabes  
 astrometry  
 ∞ astronautics  
 astronomical interferometry  
 astronomical observatories  
 astronomical photography  
 astronomical polarimetry  
 astronomical spectroscopy  
 astrophysics  
 celestial bodies  
 celestial mechanics  
 Earth limb  
 halos  
 infrared sources (astronomy)  
 infrared telescopes  
 mass to light ratios  
 meteoroid showers  
 missing mass (astrophysics)  
 ∞ physical sciences  
 relic radiation  
 ∞ science  
 seeing (astronomy)  
 selenology  
 sidereal time  
 sky surveys (astronomy)  
 solar neighborhood  
 solar parallax  
 Southern sky  
 spaceborne telescopes  
 stellar magnitude  
 stellar models  
 stellar oscillations  
 telescopes
- astrophysics**  
 DEF Study of the physical characteristics and processes associated with celestial bodies and interstellar space. The application of the laws of physics to the study of the celestial bodies and astronomical phenomena such as luminosity, size, mass, density, temperature, and chemical composition. Used for geoastronomy.
- UF *geoastronomy*  
 GS **astrophysics**  
 . computational astrophysics  
 . nuclear astrophysics  
 . stellar physics  
 . . solar physics  
 . laboratory astrophysics  
 RT accretion disks  
 association reactions  
 asteroseismology  
 astronomy  
 brightness distribution  
 brightness temperature  
 celestial bodies  
 celestial mechanics  
 cosmology  
 dark energy  
 degenerate matter  
 dense plasmas  
 disk galaxies  
 galactic evolution  
 gamma ray astronomy  
 geophysics  
 grand unified theory  
 gravitational binding energy  
 gravitational collapse  
 gravitational instability  
 helioseismology  
 interstellar extinction  
 magnetic field configurations  
 mass to light ratios  
 Michelson interferometers  
 missing mass (astrophysics)  
 naked singularities  
 Orion nebula  
 ∞ physics  
 planetary rotation  
 radio interferometers  
 radio jets (astronomy)  
 relic radiation  
 ∞ science  
 solar neutrinos  
 Spartan satellites  
 spin temperature  
 star formation  
 stellar cores  
 stellar envelopes  
 stellar evolution  
 stellar interiors  
 stellar oscillations  
 theoretical physics  
 Wolf-Rayet stars  
 X Ray Astrophysics Facility  
 x ray binaries
- Astroplane**  
 SN (LIMITED TO THE EUROPEAN AIRBORNE ASTRONOMICAL OBSERVATORY)  
 GS observatories  
 . astronomical observatories  
 . . **Astroplane**  
 RT airborne equipment  
 infrared telescopes
- asymmetrical optics*  
 USE **aspheric optics**
- asymmetry**  
 UF *dissymmetry*  
 RT antisymmetry  
 deviation  
 distortion  
 eccentricity  
 shapes  
 skewness  
 symmetry  
 variations
- asymptotes**  
 GS analysis (mathematics)  
 . real variables  
 . . **asymptotes**  
 functions (mathematics)  
 . **asymptotes**  
 RT analytic geometry  
 asymptotic properties  
 asymptotic series  
 calculus
- numerical analysis
- asymptotic giant branch stars**  
 UF *AGB stars*  
 GS celestial bodies  
 . stars  
 . . giant stars  
 . . . **asymptotic giant branch stars**  
 RT carbon stars  
 color-magnitude diagram  
 Hertzsprung-Russell diagram  
 late stars  
 M stars  
 Mira variables  
 red giant stars  
 S stars  
 stellar evolution  
 stellar mass ejection
- asymptotic methods**  
 GS problem solving  
 . **asymptotic methods**  
 RT asymptotic properties  
 iterative solution  
 learning curves  
 ∞ methodology
- asymptotic properties**  
 DEF Properties of any mathematical relation or corresponding physical system characterized by an approach to a given value as an expression, containing a variable, tends to infinity.  
 RT asymptotes  
 asymptotic methods  
 asymptotic series  
 attractors (mathematics)  
 differential equations  
 integral equations  
 mathematical models  
 normality
- asymptotic series**  
 GS analysis (mathematics)  
 . calculus  
 . . series (mathematics)  
 . . . **asymptotic series**  
 . real variables  
 . . series (mathematics)  
 . . . **asymptotic series**  
 RT asymptotes  
 asymptotic properties  
 series expansion
- asynchronous motors**  
 GS electromechanical devices  
 . electric motors  
 . . **asynchronous motors**  
 motors  
 . electric motors  
 . . **asynchronous motors**  
 RT induction motors  
 synchronous motors
- asynchronous transfer mode**  
*(added January 1997)*  
 UF *ATM (data transmission)*  
 RT broadband  
 channels (data transmission)  
 communication networks  
 data transfer (computers)  
 data transmission  
 optical switching  
 packet switching  
 packet transmission
- ATARS*  
 USE **automatic traffic advisory and resolution**
- ataxia**  
 GS diseases  
 . **ataxia**  
 RT muscles
- ataxite**  
 GS rocks  
 . **ataxite**  
 RT breccia

## Atchafalaya River Basin (LA)

soils

**Atchafalaya River Basin (LA)**  
GS landforms  
. structural basins  
. river basins  
. . . **Atchafalaya River Basin (LA)**  
RT Louisiana  
rivers

**atelectasis**  
DEF Collapsed or airless state of all or part of the lung.  
GS diseases  
. **atelectasis**  
RT lungs

**ATF**  
USE **F-22 aircraft**

**Athena rocket vehicle**  
GS rocket vehicles  
. multistage rocket vehicles  
. . . **Athena rocket vehicle**  
RT BE-3 engine  
reentry vehicles  
solid propellant rocket engines

**atherosclerosis**  
USE **arteriosclerosis**

**athletes**  
RT competition  
physical exercise  
physical fitness  
sports medicine

**athodyds**  
USE **ramjet engines**

**Atlanta (GA)**  
GS cities  
. **Atlanta (GA)**  
RT Georgia

**Atlantic aircraft**  
USE **Breguet 1150 aircraft**

**Atlantic Ocean**  
GS oceans  
. **Atlantic Ocean**  
RT Assateague Island (MD-VA)  
Azores  
Bermuda  
Block Island Sound (RI)  
Cape Hatteras (NC)  
Cape Verde  
Delaware Bay (US)  
English Channel  
GARP Atlantic Tropical Experiment  
Gulf Stream  
Lesser Antilles  
Lomonosov current  
Long Island (NY)  
mid-ocean ridges  
Outer Banks (NC)  
Sargasso Sea  
Wallops Island  
West Indies

**Atlantis (orbiter)**  
UF *Space Shuttle Orbiter 104*  
GS manned spacecraft  
. space shuttles  
. . . Space Shuttle orbiters  
. . . **Atlantis (orbiter)**  
reentry vehicles  
. recoverable spacecraft  
. . . reusable spacecraft  
. . . . space shuttles  
. . . . Space Shuttle orbiters  
. . . . **Atlantis (orbiter)**  
RT manned space flight  
Space Shuttle mission 51-H  
Space Shuttle mission 51-J  
Space Shuttle mission 61-B  
∞ spacecraft

**Atlas Able 5 launch vehicle**  
GS launch vehicles  
. Atlas launch vehicles

. . . **Atlas Able 5 launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . . Atlas launch vehicles  
. . . **Atlas Able 5 launch vehicle**  
RT lunar probes  
space probes

**Atlas Agena B launch vehicle**  
GS launch vehicles  
. Atlas launch vehicles  
. . **Atlas Agena B launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . . Atlas launch vehicles  
. . . . **Atlas Agena B launch vehicle**  
RT Agena rocket vehicles  
Mariner 2 space probe  
Midas satellites  
Ranger 4 lunar probe  
Ranger lunar probes

**Atlas Agena launch vehicles**  
GS launch vehicles  
. Atlas launch vehicles  
. . **Atlas Agena launch vehicles**  
rocket vehicles  
. multistage rocket vehicles  
. . . Atlas launch vehicles  
. . . . **Atlas Agena launch vehicles**  
RT Agena rocket vehicles  
Environmental Research Satellites  
ERS 17  
ERS 18  
Mariner 5 space probe  
Mariner 6 space probe  
Mariner program  
OGO-A  
∞ vehicles

**Atlas Centaur launch vehicle**  
GS launch vehicles  
. Atlas launch vehicles  
. . **Atlas Centaur launch vehicle**  
Centaur launch vehicle  
. . **Atlas Centaur launch vehicle**  
rocket vehicles  
. Centaur launch vehicle  
. . **Atlas Centaur launch vehicle**  
. multistage rocket vehicles  
. . . Atlas launch vehicles  
. . . . **Atlas Centaur launch vehicle**  
RT Centaur project  
OAO 1  
OAO 2  
OAO 3  
RL-10 engines  
Space Shuttle upper stage A  
Surveyor 1 lunar probe  
Surveyor 2 lunar probe  
Surveyor 3 lunar probe  
Surveyor 4 lunar probe  
Surveyor 5 lunar probe  
Surveyor 6 lunar probe  
Surveyor 7 lunar probe  
Surveyor project

**Atlas D ICBM**  
GS missiles  
. ballistic missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . **Atlas D ICBM**  
surface to surface missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . **Atlas D ICBM**  
RT Centaur launch vehicle  
Standard Launch Vehicles  
Vega launch vehicle

**Atlas E ICBM**  
GS missiles  
. ballistic missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . **Atlas E ICBM**  
surface to surface missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM

. . . . **Atlas E ICBM**

**Atlas F ICBM**  
GS missiles  
. ballistic missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . **Atlas F ICBM**  
surface to surface missiles  
. . intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . **Atlas F ICBM**

**Atlas ICBM**  
GS missiles  
. ballistic missiles  
. . intercontinental ballistic missiles  
. . . **Atlas ICBM**  
. . . . Atlas D ICBM  
. . . . Atlas E ICBM  
. . . . Atlas F ICBM  
surface to surface missiles  
. . intercontinental ballistic missiles  
. . . **Atlas ICBM**  
. . . . Atlas D ICBM  
. . . . Atlas E ICBM  
. . . . Atlas F ICBM  
RT MA-2 engine  
MA-3 engine

**Atlas launch vehicles**  
UF *SM-65 missile*  
GS launch vehicles  
. **Atlas launch vehicles**  
. . Atlas Able 5 launch vehicle  
. . Atlas Agena B launch vehicle  
. . Atlas Agena launch vehicles  
. . Atlas Centaur launch vehicle  
. . Atlas SLV-3 launch vehicle  
rocket vehicles  
. multistage rocket vehicles  
. . **Atlas launch vehicles**  
. . . Atlas Able 5 launch vehicle  
. . . Atlas Agena B launch vehicle  
. . . Atlas Agena launch vehicles  
. . . Atlas Centaur launch vehicle  
. . . Atlas SLV-3 launch vehicle  
RT EGO  
Gemini project  
MA-5 engine  
Mariner program  
Mercury flights  
Mercury MA-1 flight  
Mercury MA-2 flight  
Mercury MA-3 flight  
Mercury MA-4 flight  
Mercury MA-5 flight  
Mercury MA-6 flight  
Mercury MA-7 flight  
Mercury MA-8 flight  
Mercury MA-9 flight  
Mercury project  
Nomad launch vehicle  
OAO  
orbital rendezvous  
Ranger project  
∞ vehicles

**Atlas SLV-3 launch vehicle**  
UF *standard launch vehicle 3*  
GS launch vehicles  
. Atlas launch vehicles  
. . **Atlas SLV-3 launch vehicle**  
Standard Launch Vehicles  
. . **Atlas SLV-3 launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . Atlas launch vehicles  
. . . **Atlas SLV-3 launch vehicle**  
Standard Launch Vehicles  
. . **Atlas SLV-3 launch vehicle**  
RT liquid propellant rocket engines  
MA-5 engine

**ATLIT project**  
UF *Advanced Technology Light Twin aircraft*  
GS programs  
. NASA programs  
. . **ATLIT project**

- . projects
- .. **ATLIT project**
- RT ∞ aircraft
  - GAW-1 airfoil
  - PA-34 Seneca aircraft
- ATM (data transmission)
  - (added January 1997)
  - USE **asynchronous transfer mode**
- Atmosphere Explorer A
  - USE **Explorer 17 satellite**
- Atmosphere Explorer B
  - USE **Explorer 32 satellite**
- Atmosphere Explorer C
  - USE **Explorer 51 satellite**
- Atmosphere Explorer D
  - USE **Explorer 54 satellite**
- Atmosphere Explorer E
  - USE **Explorer 55 satellite**
- ∞ **atmospheres**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF (1) The mixture of gases surrounding the Earth or filling the habitable volume or a spacecraft. (2) The pressure exerted by a column of mercury 760 mm high at 1G, equal to 101.329 kilopascals.
  - RT air
    - argon-oxygen atmospheres
    - atmospheric pressure
    - cabin atmospheres
    - cometary atmospheres
    - controlled atmospheres
    - Earth atmosphere
    - environments
    - equatorial atmosphere
    - gas mixtures
    - gases
    - helium-oxygen atmospheres
    - hypobaric atmospheres
    - life support systems
    - meteorology
    - middle atmosphere
    - Neptune atmosphere
    - neutral atmospheres
    - nongray atmospheres
    - nongray gas
    - planetary atmospheres
    - planetary ionospheres
    - primitive Earth atmosphere
    - satellite atmospheres
    - solar atmosphere
    - stellar atmospheres
    - Uranus atmosphere

**Atmospheric & Oceanographic Inform Sys**

- SN (ATMOSPHERIC & OCEANOGRAPHIC INFORMATION SYSTEMS)
- DEF A data system designed primarily for the interactive manipulation of meteorological satellite images. Capabilities include displaying, analyzing, storing, and manipulating digital data in the field of meteorology and Earth resources. Used for AOIPS.
- UF **AOIPS**
- GS information systems
  - . **Atmospheric & Oceanographic Inform Sys**
- RT aerology
  - air water interactions
  - data processing
  - data systems
  - imagery
  - isotherms
  - meteorological parameters
  - meteorology
  - minicomputers
  - oceanographic parameters
  - oceanography
  - ∞ systems

- weather
- atmospheric absorption
  - USE **atmospheric attenuation**
- Atmospheric and Magnetospheric Payload
  - USE **AMPS (satellite payload)**
- atmospheric attenuation**
  - UF *atmospheric absorption*
  - GS attenuation
    - . **atmospheric attenuation**
    - .. auroral absorption
  - RT acoustic attenuation
    - atmospheric lasers
    - cosmic ray albedo
    - electromagnetic absorption
    - electromagnetic scattering
    - electromagnetic wave transmission
    - infrared absorption
    - microwave absorption
    - molecular absorption
    - planetary atmospheres
    - radar attenuation
    - radar transmission
    - radiation absorption
    - radio attenuation
    - radio transmission
    - shock wave attenuation
    - shock wave propagation
    - thermal absorption
    - transmission
    - vegetative index
    - wave attenuation
    - wave propagation

**atmospheric boundary layer**

- GS boundary layers
  - . **atmospheric boundary layer**
- RT air flow
  - air land interactions
  - boundary layer flow
  - Ekman layer
  - ∞ layers
    - mixing layers (fluids)
    - planetary boundary layer
    - primitive equations

**atmospheric chemistry**

- DEF Study of the production, transport, modification, and removal of atmospheric constituents in the troposphere and stratosphere.
- GS environmental chemistry
  - . **atmospheric chemistry**
- RT acid rain
  - aerothermochemistry
  - air pollution
  - Aitken nuclei
  - atmospheric effects
  - ∞ chemistry
    - formyl ions
    - middle atmosphere
    - nitrous acid
    - photochemical oxidants
    - photochemical reactions
    - physical chemistry
    - satellite atmospheres

**atmospheric circulation**

- DEF Global or hemispheric air movements which can be treated by equations of motion in contrast to atmospheric diffusion which is small random movement not amenable to treatment by these equations. Used for wind circulation.
- UF *wind circulation*
- GS circulation
  - . **atmospheric circulation**
  - .. zonal flow (meteorology)
- RT advection
  - air currents
  - air land interactions
  - air masses
  - annual variations
  - Atmospheric General Circulation Experiment
  - Atmospheric General Circulation Models
  - baroclinic instability
  - Brunt-Vaisala frequency
  - circulation distribution

- circumpolar westerlies
- climatology
- convection cells
- cyclogenesis
- Earth atmosphere
- ground wind
- horizontal distribution
- intertropical convergent zones
- intraseasonal variations
- jet streams (meteorology)
- Kelvin waves
- Madden-Julian Oscillation
- meridional flow
- middle atmosphere
- mixing height
- monsoons
- planetary meteorology
- planetary waves
- pollution transport
- quasi-biennial oscillation
- sea breeze
- Southern Oscillation
- superrotation
- tornadoes
- TRMM satellite
- tropical storms
- turbopause
- typhoons
- upwelling water
- vertical air currents
- vorticity
- wind (meteorology)
- wind direction
- wind profiles
- windpower utilization

**Atmospheric Cloud Physics Lab (Spacelab)**

- DEF A NASA Spacelab mission involving cloud physics experiments in zero gravity environment. Also known as ACPL. Used for ACPL (Spacelab) and zero-g ACPL (Spacelab).
- UF *ACPL (Spacelab)*
  - zero-g ACPL (Spacelab)*
- GS laboratories
  - . space laboratories
  - .. **Atmospheric Cloud Physics Lab (Spacelab)**
    - payloads
    - . Spacelab payloads
    - .. **Atmospheric Cloud Physics Lab (Spacelab)**
- RT cloud physics
  - meteorological parameters
  - nephanalysis
  - spacecraft instruments

**atmospheric composition**

- GS composition (property)
  - . **atmospheric composition**
  - .. atmospheric moisture
  - .. ionospheric composition
- RT aeronomy
  - air
    - air pollution
    - Aitken nuclei
    - carbon dioxide concentration
    - chemical composition
    - climate change
    - Earth atmosphere
    - electron density (concentration)
    - equatorial atmosphere
    - Gaia hypothesis
    - gas composition
    - horizontal distribution
    - in situ measurement
    - isotope ratios
    - LACATE (experiment)
    - middle atmosphere
    - mixing ratios
    - moisture content
    - Orbiting Carbon Observatory (OCO)
    - ozone depletion
    - particulates
    - planetary atmospheres
    - primitive Earth atmosphere
    - radio occultation
    - radioactive contaminants
    - satellite atmospheres
    - Saturn atmosphere

## atmospheric conductivity

Solar Mesosphere Explorer  
Titan

*atmospheric conditions*

USE **meteorology**

### atmospheric conductivity

GS transport properties  
. **atmospheric conductivity**  
. . ionospheric conductivity  
RT air conductivity  
 $\infty$  conductivity  
electrical resistivity  
thermal conductivity

### atmospheric correction

DEF Removal of the effects of the intervening atmosphere from satellite imagery.

GS correction  
. **atmospheric correction**

RT anisoplanatism  
atmospheric effects  
clouds (meteorology)  
geometric rectification (imagery)  
image classification  
image processing  
infrared radiometers  
radiative transfer  
satellite imagery  
spatial resolution

### atmospheric density

GS density (mass/volume)  
. **atmospheric density**  
RT air pollution  
Boltzmann distribution  
 $\infty$  density  
density (number/volume)  
electron density (concentration)  
humidity  
ion density (concentration)  
magnetospheric electron density  
magnetospheric ion density  
magnetospheric proton density  
meteorology  
particle density (concentration)  
planetary atmospheres  
plasma density  
proton density (concentration)  
space density

### atmospheric diffusion

GS diffusion  
. **atmospheric diffusion**  
RT Boltzmann distribution  
molecular diffusion  
pollution transport  
radio scattering  
turbulent diffusion

### atmospheric effects

RT aerosols  
air pollution  
atmospheric chemistry  
atmospheric correction  
 $\infty$  effects  
erosion  
exposure  
rusting  
seeing (astronomy)  
soil erosion  
turbulence  
vegetative index  
wind effects  
wind erosion

### atmospheric electricity

DEF Electrical phenomena, regarded collectively, which occur in the Earth's atmosphere. Also the study of electrical processes occurring within the atmosphere.

GS electricity  
. **atmospheric electricity**  
. . ionospheric currents  
. . . Birkeland currents  
. . . electrojets  
. . . . auroral electrojets  
. . . . equatorial electrojet  
. . . Pedersen currents  
RT atmospheric

ball lightning  
cloud physics  
dust storms  
Earth atmosphere  
electric corona  
electron density profiles  
elves  
field aligned currents  
lightning  
lightning suppression  
primitive Earth atmosphere  
ring currents  
sprites (atmospheric physics)  
static electricity  
telluric currents

*atmospheric emission*

USE **airglow**

### atmospheric energy sources

RT ammonia  
atmospheric heat budget  
atmospheric heating  
atmospheric physics  
energy budgets  
 $\infty$  energy sources  
ethyl alcohol  
planetary atmospheres

### atmospheric entry

DEF The penetration of any planetary atmosphere by any object from outer space; specifically, the penetration of the Earth's atmosphere by a manned or unmanned capsule or spacecraft. Used for planetary entry.

UF *planetary entry*  
GS **atmospheric entry**

. reentry  
. . hyperbolic reentry  
. . hypersonic reentry  
. . . uncontrolled reentry (spacecraft)  
. . manned reentry  
. . spacecraft reentry  
. . . uncontrolled reentry (spacecraft)

RT ablation  
aeroassist  
aerocapture  
aerodynamic heating  
aeromaneuvering  
bolides  
descent trajectories  
Earth atmosphere  
 $\infty$  entry  
entry guidance (STS)  
falling  
Galileo project  
gas guns  
orbit decay  
space flight  
spacecraft breakup

### atmospheric entry simulation

GS simulation  
. **atmospheric entry simulation**  
RT environment simulation  
flight simulators  
landing simulation  
space environment simulation

### Atmospheric General Circulation Experiment

DEF Model experiment of the Earth's atmospheric circulation as proposed for a Spacelab flight on which a liquid contained between two concentric spheres is subjected to rotation. The thermal driving force will be a stable radial temperature gradient and an unstable latitudinal gradient.

GS payloads  
. Space Shuttle payloads  
. . **Atmospheric General Circulation Experiment**  
. . Spacelab payloads  
. . . **Atmospheric General Circulation Experiment**  
RT atmospheric circulation  
Atmospheric General Circulation Models  
Earth atmosphere

space transportation system

### Atmospheric General Circulation Models

(added March 1989)

GS models  
. atmospheric models  
. . **Atmospheric General Circulation Models**  
RT atmospheric circulation  
Atmospheric General Circulation Experiment  
climatology  
long range weather forecasting  
numerical weather forecasting

### atmospheric heat budget

GS energy budgets  
. heat budget  
. . **atmospheric heat budget**  
RT atmospheric energy sources  
Earth radiation budget  
greenhouse effect  
heat balance  
heat transfer  
stratospheric warming

### atmospheric heating

SN (EXCLUDES AERODYNAMIC HEATING)  
GS heating  
. **atmospheric heating**  
. . global warming  
. . stratospheric warming  
RT atmospheric energy sources  
bolides  
radiative forcing

*atmospheric impurities*

USE **air pollution**

### atmospheric ionization

UF *meteoritic ionization*  
GS ionization  
. gas ionization  
. . **atmospheric ionization**  
. . . auroral ionization  
RT afterglows  
airglow  
Antares rocket vehicle  
Earth ionosphere  
electron density profiles  
elves  
photoionization  
plasmasphere  
radio meteors  
riometers  
sprites (atmospheric physics)

### atmospheric lasers

DEF The theoretical phenomena whereby the upper atmosphere is used as the lasing medium.

GS stimulated emission devices  
. lasers  
. . **atmospheric lasers**  
RT atmospheric attenuation  
atmospheric optics  
atmospheric scattering  
laser outputs  
TEA lasers

*atmospheric loading*

USE **pollution transport**

### atmospheric models

GS models  
. **atmospheric models**  
. . Atmospheric General Circulation Models  
. . reference atmospheres  
RT baroclinic instability  
Chapman-Ferraro problem  
climate models  
environment models  
environment simulation  
horizontal distribution  
intra-seasonal variations  
large eddy simulation  
Madden-Julian Oscillation  
mathematical models  
numerical weather forecasting

ocean models  
 primitive Earth atmosphere  
 solar oscillations  
 stellar oscillations  
 Venus clouds  
 weather forecasting

**atmospheric moisture**

GS composition (property)  
 . atmospheric composition  
 . . **atmospheric moisture**  
 . concentration (composition)  
 . . moisture content  
 . . . **atmospheric moisture**  
 moisture  
 . **atmospheric moisture**  
 RT acid rain  
 Advanced Microwave Sounding Unit  
 anvil clouds  
 cap clouds  
 cirrocumulus clouds  
 cirrostratus clouds  
 clouds (meteorology)  
 dew point  
 humidity  
 hydrometeors  
 mixing ratios  
 precipitation (meteorology)  
 psychrometers  
 water vapor

*atmospheric noise*

USE **atmospherics**

**atmospheric optics**

DEF The study of the optical characteristics of the atmosphere and of the optical phenomena produced by the atmosphere's suspensoids and hydrometeors. It embraces the study of refraction, reflection, diffraction, scattering, and polarization of light, but is not commonly regarded as including the study of any other kinds of radiation.

RT adaptive optics  
 anisoplanatism  
 atmospheric lasers  
 clarity  
 haze  
 infrared absorption  
 light transmission  
 opacity  
 ∞ optics  
 seeing (astronomy)  
 thermal lensing  
 transparency  
 vegetative index

**atmospheric physics**

UF *aerophysics*  
 GS **atmospheric physics**  
 . cloud physics  
 RT aeronomy  
 atmospheric energy sources  
 Brunt-Vaisala frequency  
 dust storms  
 Earth sciences  
 International Magnetospheric Study  
 magnetosphere-ionosphere coupling  
 meteorology  
 neutral sheets  
 ∞ physics  
 planetary meteorology  
 satellite atmospheres  
 ∞ science  
 secular variations  
 turbopause

**atmospheric pressure**

DEF The pressure at any point in an atmosphere due solely to the weight of the atmospheric gases above the point concerned. Used for barometric pressure.

UF *barometric pressure*  
 GS pressure  
 . **atmospheric pressure**  
 RT anticyclones  
 ∞ atmospheres  
 cyclogenesis  
 cyclones  
 gas pressure

geopotential height  
 high altitude pressure  
 isobars (pressure)  
 isostatic pressure  
 meteorological parameters  
 pressure gradients  
 radio occultation  
 Southern Oscillation  
 weather

**atmospheric radiation**

DEF Infrared radiation emitted by or being propagated through the atmosphere.

GS **atmospheric radiation**  
 . auroras  
 . . auroral arcs  
 . . . red arcs  
 . . radio auroras  
 . dawn chorus  
 . ionospheric noise  
 . . whistlers  
 . sky radiation  
 . . airglow  
 . . . geocoronal emissions  
 . . . nightglow  
 . . . twilight glow  
 . . dayglow  
 . . elves  
 . . sprites (atmospheric physics)  
 . stratosphere radiation  
 . tropospheric radiation  
 RT CLARREO (observatory)  
 corpuscular radiation  
 Earth radiation budget  
 electromagnetic radiation  
 extraterrestrial radiation  
 greenhouse effect  
 ionospheric heating  
 light (visible radiation)  
 ∞ radiation  
 radiative forcing  
 ∞ rays  
 secondary cosmic rays  
 terrestrial radiation  
 VLF emission recorders

**atmospheric refraction**

DEF Refraction resulting when a ray of radiant energy passes obliquely through an atmosphere.

GS refraction  
 . **atmospheric refraction**  
 . . radio wave refraction  
 RT electromagnetic radiation  
 light transmission  
 refractivity  
 solar radiation  
 wave dispersion

**atmospheric scattering**

GS scattering  
 . wave scattering  
 . . **atmospheric scattering**  
 . . . tropospheric scattering  
 RT atmospheric lasers  
 circumsolar radiation  
 diffraction  
 diffusion  
 electromagnetic scattering  
 halos  
 light scattering  
 microwave scattering  
 radio scattering  
 signal fading  
 vegetative index

*atmospheric seeing*

USE **seeing (astronomy)**

*atmospheric shells*

USE **atmospheric stratification**

**atmospheric sounding**

DEF Measurement of atmospheric phenomena generally with instruments carried aloft by spacecraft, rockets, etc.

GS sounding  
 . **atmospheric sounding**  
 RT Advanced Microwave Sounding Unit  
 balloon sounding

differential absorption lidar  
 in situ measurement  
 ionospheric sounding  
 NOAA 19 satellite  
 NPOESS  
 rocket sounding  
 satellite sounding  
 sodar  
 visible infrared spin scan radiometer

**atmospheric stratification**

DEF The presence of strata or layers in the Earth's atmosphere. Used for atmospheric shells.

UF *atmospheric shells*  
 GS stratification  
 . **atmospheric stratification**  
 RT Brunt-Vaisala frequency  
 mixing layers (fluids)  
 plasma layers  
 surface layers

**atmospheric temperature**

GS temperature  
 . **atmospheric temperature**  
 . . auroral temperature  
 . . ionospheric temperature  
 RT Advanced Microwave Sounding Unit  
 ambient temperature  
 climate change  
 Gaia hypothesis  
 gas temperature  
 global warming  
 isotherms  
 LACATE (experiment)  
 land surface temperature  
 meteorological parameters  
 planetary atmospheres  
 planetary temperature  
 quasi-biennial oscillation  
 radiative forcing  
 radio occultation  
 sound detecting and ranging  
 stratospheric warming  
 subzero temperature  
 temperature gradients  
 temperature inversions  
 thermal resources  
 weather

**atmospheric tides**

DEF Defined in analogy to the oceanic tide as an atmospheric motion on a worldwide scale, in which vertical accelerations are neglected (but compressibility is taken into account).

GS tides  
 . **atmospheric tides**  
 RT Earth tides  
 lunar tides

**atmospheric turbulence**

GS turbulence  
 . **atmospheric turbulence**  
 . . clear air turbulence  
 . . gusts  
 . . low level turbulence  
 RT aviation meteorology  
 dissipation  
 gust loads  
 homogeneous turbulence  
 isotropic turbulence  
 laminar flow  
 meteorological parameters  
 meteorology  
 seeing (astronomy)  
 sodar  
 tephigrams  
 turbopause  
 turbulent diffusion  
 turbulent flow  
 wind variations

**atmospheric windows**

DEF Wavelength intervals at which the atmosphere transmits the most electromagnetic radiation.

RT astronomical photography

## atmospherics

astronomical photometry

### atmospherics

DEF The radiofrequency electromagnetic radiations originating, principally, in the irregular surges of charge in thunderstorm lightning discharges. Atmospherics are heard as a quasi-steady background of crackling noise (static) in ordinary amplitude modulated radio receivers. Used for atmospheric noise and sferics.

UF *atmospheric noise sferics*

GS electromagnetic interference  
. radio frequency interference  
. . . electromagnetic noise

. . . . **atmospherics**

. . . . . ionospherics  
. . . . . dawn chorus  
. . . . . hiss  
. . . . . sudden enhancement of  
          atmospherics  
. . . . . whistlers

RT atmospheric electricity  
blackout (propagation)  
electromagnetic compatibility  
radio meteorology  
radio waves  
static electricity  
thunderstorms  
VLF emission recorders

### atoll reefs

USE **coral reefs**

### atolls

DEF Coral reefs appearing in plan view as roughly circular (though sometimes elliptical or horseshoe-shaped), and surmounted by a chain or ring of closely spaced low coral inlets that encircle a shallow lagoon in which there is no pre-existing land or islands of non-coral origin; the reefs are surrounded by deep water of the open sea, either oceanic or continental shelves. Atolls range in diameter from 1 km to more than 130 km, and are especially common today in the western and central Pacific Ocean. Atoll is derived from the native name in the Maldive Islands (Indian Ocean) which are typical examples of this structure.

GS landforms  
. islands  
. . **atolls**

RT coral reefs  
lagoons  
reefs

### atom concentration

GS composition (property)  
. concentration (composition)  
. . **atom concentration**

RT chemical composition  
 $\infty$  density  
electron density (concentration)  
flux density  
gas composition  
gas density  
ion density (concentration)  
ionospheric composition  
plasma composition  
plasma density  
proton density (concentration)

### atom optics

(added January 2002)

DEF Field of study addressing the manipulation of atomic beams in a way that is analogous to the manipulation of light by conventional optics. Reflection, diffraction, and focusing of the atoms is typically carried out through interaction with lasers tuned to the atomic resonances.

RT atomic beams  
beam interactions  
Bose-Einstein condensates  
electron optics  
four-wave mixing  
ion optics  
laser cooling  
 $\infty$  optics

quantum optics

### atomic batteries

USE **radioisotope batteries**

### atomic beams

GS beams (radiation)  
. particle beams  
. . **atomic beams**  
RT atom optics  
ion beams  
molecular beams  
neutral atoms  
neutral beams  
neutron beams  
particle diffusion  
rarefied gas dynamics

### atomic bombs

USE **fission weapons**

### atomic clocks

DEF Timekeeping devices controlled by the frequency of the natural vibrations of certain atoms.

GS measuring instruments  
. time measuring instruments  
. . clocks  
. . . **atomic clocks**

RT autonomous spacecraft clocks  
chronometers  
clock paradox  
frequency standards  
gas masers  
masers  
molecular beams  
time measurement

### atomic clusters

(added January 1994)

RT adatoms  
agglomeration  
chemisorption  
clumps  
 $\infty$  clusters  
fullerenes  
metal clusters  
molecular clusters  
nucleation

### atomic collisions

GS atomic interactions  
. **atomic collisions**  
collisions  
. **atomic collisions**

RT  $\infty$  absorption  
atomizing  
autoionization  
 $\infty$  cross sections  
elastic scattering  
electron scattering  
 $\infty$  interactions  
ionic collisions  
ionization  
molecular collisions  
particle collisions  
recoil ions  
recombination reactions  
scattering

### atomic energy

USE **nuclear energy**

### atomic energy levels

UF *triplet excitation*  
*triplet state*  
GS level (quantity)  
. energy levels  
. . **atomic energy levels**  
RT atomic interactions  
excitation  
ground state  
Landau factor  
laser cooling  
line spectra  
spontaneous emission

### atomic excitations

GS excitation  
. **atomic excitations**

RT energy levels  
Heisenberg theory  
ionization  
molecular excitation  
particle collisions  
resonance fluorescence

### atomic explosions

USE **nuclear explosions**

### atomic force microscopy

(added February 1994)

DEF A form of microscopy that allows the imaging of general surface morphology and surface atomic structure by the measurement of the atomic forces acting on a sharply pointed probe as it is moved across the surface of a specimen.

UF *AFM (microscopy)*

GS microscopy  
. **atomic force microscopy**

RT atomic structure  
crystal surfaces  
interatomic forces  
microstructure  
nanofabrication  
nanoindentation  
surface properties  
thin films

### atomic gases

USE **monatomic gases**

### atomic interactions

GS **atomic interactions**

. atomic collisions  
RT atomic energy levels  
 $\infty$  interactions  
ion atom interactions  
molecular structure  
quantum mechanics

### atomic layer deposition

(added August 2009)

USE **atomic layer epitaxy**

### atomic layer epitaxy

(added June 1997)

UF *atomic layer deposition*  
growth

GS . crystal growth  
. . epitaxy  
. . . **atomic layer epitaxy**  
RT molecular beam epitaxy  
thin films  
vapor deposition  
vapor phase epitaxy

### atomic mass

USE **atomic weights**

### atomic mobilities

GS mobility  
. **atomic mobilities**  
RT electron mobility  
hole mobility  
ionic mobility  
self diffusion (solid state)

### atomic physics

RT Hartree-Fock-Slater method  
 $\infty$  physics  
resonance fluorescence  
 $\infty$  science

### atomic recombination

GS chemical reactions  
. **atomic recombination**  
. . oxygen recombination  
recombination reactions  
. **atomic recombination**  
. . oxygen recombination  
RT deionization  
dissociation  
emission  
emission spectra  
ion recombination  
radiative recombination

### atomic spectra

GS spectra

	. <b>atomic spectra</b>	. hot atoms	navigation satellites
RT	Balmer series	. hydrogen atoms	NAVSTAR satellites
	Lyman alpha radiation	. metastable atoms	
	Lyman beta radiation	. neutral atoms	
	Lyman spectra	. nitrogen atoms	
	Paschen series	. oxygen atoms	
	Rydberg series	. recoil atoms	
<b>atomic structure</b>		RT atomic structure	
SN	(THIS TERM WAS USED FOR "ELECTRONIC STRUCTURE" PRIOR TO MAY 1999)	chemical elements	
RT	atomic force microscopy	∞ elements	
	atoms	free radicals	
	constitution	ions	
	crystal lattices	isomers	
	density functional theory	isotope separation	
	electronic structure	isotopes	
	elementary particles	molecules	
	energy levels	monatomic molecules	
	fine structure	nuclei (nuclear physics)	
	gravitons	polyatomic molecules	
	Hartree approximation	positive ions	
	hyperfine structure	positronium	
	interatomic forces		
	isoelectronic sequence	ATP	
	melts (crystal growth)	USE <b>adenosine triphosphate</b>	
	molecular structure	ATR reactor	
	nuclear chemistry	USE <b>advanced test reactors</b>	
	nuclear models	ATR-72 aircraft	
	nuclear physics	(added September 1994)	
	octets	GS jet aircraft	
	order-disorder transformations	. turboprop aircraft	
	particle precipitation	. . . <b>ATR-72 aircraft</b>	
	Pauli exclusion principle	passenger aircraft	
	polywater	. commuter aircraft	
∞	structures	. . . <b>ATR-72 aircraft</b>	
	Thomas-Fermi model	RT ∞ aircraft	
<b>atomic theory</b>		<b>atrophy</b>	
GS	<b>atomic theory</b>	RT biological effects	
	. Heisenberg theory	degeneration	
RT	electron transitions	deterioration	
	ground state	glucocorticoids	
	Landau factor	hindlimb suspension	
∞	nuclear energy	nutritional requirements	
	quantum theory	physical exercise	
∞	theories	tissues (biology)	
<b>atomic weights</b>		<b>atropine</b>	
DEF	The weight of an atom according to a scale of atomic weight units, awu, valued as one-twelfth the mass of the carbon atom. Used for atomic mass.	GS bases (chemical)	
UF	<i>atomic mass</i>	. alkaloids	
GS	weight (mass)	. . . <b>atropine</b>	
	. <b>atomic weights</b>	drugs	
RT	∞ weight	. stimulants	
		. . . <b>atropine</b>	
atomization		nitrogen compounds	
USE	<b>atomizing</b>	. alkaloids	
		. . . <b>atropine</b>	
<b>atomizers</b>		organic compounds	
RT	atomizing	. cyclic compounds	
	evaporators	. . . heterocyclic compounds	
	grinding mills	. . . alkaloids	
∞	nozzles	. . . . <b>atropine</b>	
	sprayers		
<b>atomizing</b>		ATS	
UF	<i>atomization</i>	UF <i>Applications Technology Satellites</i>	
GS	<b>atomizing</b>	GS artificial satellites	
	. gas atomization	. gravity gradient satellites	
	. liquid atomization	. . . <b>ATS</b>	
RT	aerosols	. . . ATS 1	
	atomic collisions	. . . ATS 2	
	atomizers	. . . ATS 3	
	colloidal generators	. . . ATS 4	
	colloiding	. . . ATS 5	
	comminution	. . . ATS 6	
	disintegration	. . . ATS 7	
	flaking	. . . ATS 8	
	grinding (comminution)	. scientific satellites	
	grinding mills	. . . <b>ATS</b>	
	metal powder	. . . ATS 1	
	spraying	. . . ATS 2	
<b>atoms</b>		. . . ATS 3	
GS	<b>atoms</b>	. . . ATS 4	
	. adatoms	. . . ATS 5	
	. helium atoms	. . . ATS 6	
		. . . ATS 7	
		. . . ATS 8	
		RT communication satellites	
		Early Bird satellites	
		meteorological satellites	
		ATS 1	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 1</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 1</b>	
		ATS 2	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 2</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 2</b>	
		ATS 3	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 3</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 3</b>	
		ATS 4	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 4</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 4</b>	
		ATS 5	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 5</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 5</b>	
		ATS 6	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 6</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 6</b>	
		RT HET experiment	
		ATS 7	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 7</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 7</b>	
		ATS 8	
		GS artificial satellites	
		. gravity gradient satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 8</b>	
		. scientific satellites	
		. . . <b>ATS</b>	
		. . . <b>ATS 8</b>	
∞	<b>attachment</b>		
	SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)		
	UF <i>reattachment</i>		
	RT assembling		
	Coanda effect		
	electron attachment		
	mounting		



# attack

reattached flow

## attachments

USE **accessories**

## ∞ attack

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT angle of attack  
attacking (assaulting)  
chemical attack

## attack aircraft

GS **attack aircraft**

. A-1 aircraft  
. A-7 aircraft  
. A-9 aircraft  
. A-10 aircraft  
. A-37 aircraft  
. AH-1G helicopter  
. AH-63 helicopter  
. AH-64 helicopter  
. bomber aircraft  
. . A-2 aircraft  
. . A-3 aircraft  
. . A-4 aircraft  
. . A-5 aircraft  
. . A-6 aircraft  
. . B-1 aircraft  
. . B-2 aircraft  
. . B-26 aircraft  
. . B-47 aircraft  
. . B-50 aircraft  
. . B-52 aircraft  
. . B-57 aircraft  
. . B-58 aircraft  
. . B-66 aircraft  
. . B-70 aircraft  
. . F-111 aircraft  
. . Shackleton bomber  
. . Valiant aircraft  
. . Victor MK-1 aircraft  
. . Vulcan aircraft  
. Breguet 1150 aircraft  
. Buccaneer aircraft  
. CL-41 aircraft  
. COIN aircraft  
. . F-5 aircraft  
. . OV-10 aircraft  
. DH 115 aircraft  
. fighter aircraft  
. . Alpha jet aircraft  
. . DH 112 aircraft  
. . F-2 aircraft  
. . F-4 aircraft  
. . F-5 aircraft  
. . F-8 aircraft  
. . F-9 aircraft  
. . F-14 aircraft  
. . F-15 aircraft  
. . F-16 aircraft  
. . F-17 aircraft  
. . F-18 aircraft  
. . F-20 aircraft  
. . F-22 aircraft  
. . F-84 aircraft  
. . F-86 aircraft  
. . F-89 aircraft  
. . F-94 aircraft  
. . F-100 aircraft  
. . F-101 aircraft  
. . F-102 aircraft  
. . F-104 aircraft  
. . F-105 aircraft  
. . F-106 aircraft  
. . F-117A aircraft  
. . FV-12A aircraft  
. . G-91 aircraft  
. . G-95/4 aircraft  
. . GA-5 aircraft  
. . Harrier aircraft  
. . Jaguar aircraft  
. . JAS-39 aircraft  
. . jet provost aircraft  
. . MiG aircraft  
. . Mirage aircraft  
. . . Mirage 3 aircraft  
. . P-51 aircraft  
. . P-1127 aircraft

. . P-1154 aircraft  
. . Saab 37 aircraft  
. . Scimitar aircraft  
. . Vampire MK 35 aircraft  
. . YF-12 aircraft  
. AH-1S helicopter  
. AH-1W helicopter  
. P-308 aircraft  
. T-2 aircraft  
. TSR-2 aircraft  
RT aeroquatic vehicles  
∞ aircraft  
antisubmarine warfare aircraft  
jet aircraft  
∞ military aircraft  
military helicopters  
MRCA aircraft  
supersonic aircraft  
terrain following  
V/STOL aircraft

## attacking (assaulting)

UF *assaulting*  
GS **violence**  
. **attacking (assaulting)**  
RT ∞ attack  
∞ military aircraft  
tactics  
warfare

## attention

RT alertness  
consciousness

## attenuation

DEF Reducing in intensity.  
GS **attenuation**  
. atmospheric attenuation  
. . auroral absorption  
. microwave attenuation  
. sidelobe reduction  
. wave attenuation  
. . acoustic attenuation  
. . . shock wave attenuation  
. . radar attenuation  
. . radio attenuation  
RT ∞ absorption  
attenuators  
∞ conduction  
damping  
diffraction  
dilution  
dissipation  
electromagnetic absorption  
electromagnetic wave transmission  
elimination  
fading  
impingement  
∞ inhibition  
internal friction  
light (visible radiation)  
mechanical impedance  
∞ propagation  
∞ reduction  
retarding  
shielding  
signal fading  
signal to noise ratios  
sound propagation  
sound transmission  
spatial filtering  
transmission  
transmission loss  
transmitters  
vibration damping  
wave degradation  
wave diffraction  
wave dispersion  
wave propagation

## attenuation coefficients

DEF A measure of the space rate of attenuation of any transmitted electromagnetic radiation.  
GS **coefficients**  
. **attenuation coefficients**  
RT diffusion coefficient  
flow coefficients  
impedance  
opacity

reflectance  
scattering coefficients  
transmission efficiency  
transmittance

## attenuators

DEF Devices for measuring attenuation. They are usually calibrated in dB (decibels).  
GS **attenuators**  
. resistors  
. . potentiometers (resistors)  
. . printed resistors  
. . thermistors  
RT ∞ absorbers  
absorbers (materials)  
attenuation  
baffles  
deflectors  
∞ diffusers  
electromagnetic wave filters  
equalizers (circuits)  
∞ filters  
insulators  
inverters  
isolators  
mufflers  
power limiters  
radiation shielding  
reflectors  
shielding  
silencers  
suppressors

## attitude (inclination)

DEF The position or orientation of an aircraft, spacecraft, etc., either in motion or at rest, as determined by the relationship between its axes and some reference line or plane or some fixed system of reference axes. Used for spatial orientation, tilt, and tilting.  
UF *spatial orientation*  
*tilt*  
*tilting*  
GS **attitude (inclination)**  
. pitch (inclination)  
. roll  
. satellite orientation  
. yaw  
RT horizontal orientation  
instrument orientation  
misalignment  
∞ motion  
∞ orientation  
∞ position  
∞ space orientation  
stability augmentation  
tiltmeters  
vertical orientation

## attitude control

DEF The regulation of the attitude of an aircraft, spacecraft, etc. Also a device or system that automatically regulates and corrects attitude, especially of a pilotless vehicle.  
GS **attitude control**  
. directional control  
. . thrust vector control  
. lateral control  
. longitudinal control  
. satellite attitude control  
RT air traffic control  
aircraft control  
automatic control  
cold gas  
∞ control  
control moment gyroscopes  
flight control  
guidance sensors  
helicopter control  
horizon scanners  
magnetic control  
manual control  
Miranda satellite  
missile control  
orbital lifetime  
reaction wheels  
remote control  
rocket engine control  
satellite control  
solar sensors

- spacecraft control  
spacing  
spin stabilization  
star trackers  
thrust control  
trajectory control  
visual control
- attitude gyros**  
DEF Gyro-operated flight instruments that indicate the attitude of an aircraft or spacecraft with respect to a reference coordinate system throughout 360 degrees of rotation about each axis of the craft.  
GS gyroscopes  
. **attitude gyros**  
. . gyro horizons  
RT control moment gyroscopes  
sea keeping
- attitude indicators**  
UF *helicopter attitude indicators*  
*yawmeters*  
GS flight instruments  
. **attitude indicators**  
. . gyro horizons  
measuring instruments  
. indicating instruments  
. . **attitude indicators**  
. . . gyro horizons  
navigation aids  
. navigation instruments  
. . **attitude indicators**  
. . . gyro horizons  
RT aircraft instruments  
control moment gyroscopes  
flight control
- attitude stability**  
UF *satellite attitude disturbance*  
GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . **attitude stability**  
. . . . directional stability  
. . . . . gyroscopic stability  
. . . . lateral stability  
. . . . longitudinal stability  
stability  
. dynamic stability  
. . motion stability  
. . . **attitude stability**  
. . . . directional stability  
. . . . . gyroscopic stability  
. . . . lateral stability  
. . . . longitudinal stability  
RT aerodynamic stability  
aircraft stability  
Discos (satellite attitude control)  
hovering stability  
low speed stability  
satellite attitude control  
spacecraft motion  
spacecraft stability  
tumbling motion
- attraction**  
RT affinity  
field theory (physics)  
 $\infty$  force  
gravitational fields
- attractors (mathematics)**  
(added June 1997)  
GS **attractors (mathematics)**  
. strange attractors  
RT asymptotic properties  
chaos  
dynamical systems  
nonlinear systems  
stochastic processes  
trajectories
- attributes*  
USE **properties**
- attrition (materials)*  
USE **comminution**
- audio data**  
DEF Useful information at audio signal frequency.
- RT audio frequencies  
 $\infty$  data  
data transmission
- audio equipment**  
GS **audio equipment**  
. earphones  
. loudspeakers  
. microphones  
RT audio visual equipment  
 $\infty$  equipment  
monaural signals
- audio frequencies**  
SN (APPROXIMATELY 20 TO 20,000 HZ)  
DEF Frequencies corresponding to normally audible sound waves.  
GS frequencies  
. acoustic frequencies  
. . **audio frequencies**  
. . . quefrequencies  
RT acoustic measurement  
audio data  
audio signals  
auditory perception  
cepstral analysis  
extremely low frequencies  
monaural signals  
noise pollution  
radio frequencies  
sound generators  
sound transmission  
sound waves  
very low frequencies  
voice
- audio signals**  
DEF Signals with a bandwidth of less than 20 kilohertz.  
RT audio frequencies  
auditory signals  
signal processing  
signal transmission  
 $\infty$  signals
- audio tapes**  
(added February 1992)  
RT acoustics  
audio visual material  
information  
magnetic tapes  
 $\infty$  tapes  
video tapes
- audio visual equipment**  
(added September 1993)  
RT audio equipment  
display devices  
multimedia  
training devices  
video equipment  
visual aids
- audio visual material**  
(added September 1993)  
RT audio tapes  
multimedia  
visual aids
- audiology**  
RT audiometry  
auditory fatigue  
auditory perception  
hearing
- audiometry**  
DEF The testing and measurement of hearing at various levels.  
RT acoustic measurement  
audiology  
auditory defects  
auditory fatigue  
auditory perception  
auditory stimuli  
hearing  
masking  
 $\infty$  measurement
- thresholds (perception)
- auditory defects**  
UF *deafness*  
*hearing loss*  
GS defects  
. **auditory defects**  
RT audiometry  
bioacoustics  
disabilities  
losses
- auditory fatigue**  
GS fatigue (biology)  
. **auditory fatigue**  
RT audiology  
audiometry  
hearing  
noise threshold
- auditory perception**  
UF *sound perception*  
GS perception  
. sensory perception  
. . **auditory perception**  
RT acoustics  
audio frequencies  
audiology  
audiometry  
auditory sensation areas  
binaural hearing  
ear  
earphones  
monaural signals  
noise threshold  
psychoacoustics  
sensitivity  
sound localization  
sound waves  
speech  
thresholds (perception)  
Weber test
- auditory sensation areas**  
DEF In acoustics, the frequency region enclosed by the curves defining the threshold of pain and the threshold of audibility.  
RT auditory perception  
auditory stimuli  
bioacoustics  
thresholds (perception)
- auditory signals**  
UF *chimes*  
RT audio signals  
bells  
cues  
horns  
monaural signals  
psychoacoustics  
signal mixing  
 $\infty$  signals  
warning  
warning systems
- auditory stimuli**  
GS stimulation  
. **auditory stimuli**  
RT acoustics  
audiometry  
auditory sensation areas  
noise (sound)  
noise intensity  
sound generators  
sound intensity  
 $\infty$  stimuli  
thresholds (perception)
- auditory tasks**  
GS tasks  
. **auditory tasks**  
RT acoustics  
hearing  
noise (sound)
- aufeis (ice)**  
DEF Icing of ground or river water in Arctic areas with continuous permafrost on which the water has continued to flow.  
RT ice

## Auger effect

melting  
permafrost  
rivers

### Auger effect

DEF The nonradiative transition of an atom from an excited electronic energy state to a lower state with the emission of an electron. The term usually refers to the x ray region of energy states. The final state corresponds to one higher degree of ionization than does the initial state. The effect is an alternative process to the transition to a lower state having the same degree of ionization with the emission of an x ray photon, and thus is analogous to the internal conversion of a nuclear transmission.

RT cosmic ray showers  
∞ effects  
electron transitions  
Langmuir turbulence

### Auger showers

(added August 1997)

USE cosmic ray showers

### Auger spectroscopy

GS spectroscopy  
. **Auger spectroscopy**  
RT chemical analysis  
electron transitions  
spectroscopic analysis  
thermites

### augmentation

UF *enhancement*  
GS **augmentation**  
. stability augmentation  
. thrust augmentation  
RT increasing  
spatial filtering

### AUOS

USE **Automatic Universal Orbiting Stations**

### Aura spacecraft

(added May 2005)

DEF The third of a series of Earth Observing System (EOS) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. Aura studies the Earth's ozone, air quality and climate, and is designed exclusively to conduct research on the composition, chemistry and dynamics of the Earth's upper and lower atmosphere employing multiple instruments on a single satellite. The spacecraft carries four instruments: the High Resolution Dynamics Limb Sounder (HIRDLS), the Microwave Limb Sounder (MLS), Ozone Monitoring Instrument (OMI), and the Tropospheric Emission Spectrometer (TES).

GS artificial satellites  
. scientific satellites  
. **Aura spacecraft**  
Earth Observing System (EOS)  
. **Aura spacecraft**  
RT Aqua spacecraft  
CALIPSO (Pathfinder satellite)  
CloudSat  
data products  
Earth observations (from space)  
remote sensing  
Terra spacecraft

### Auriga constellation

GS constellations  
. **Auriga constellation**  
RT Zeta Aurigae star

### Aurora 7

GS manned spacecraft  
. Mercury spacecraft  
. **Aurora 7**  
reentry vehicles  
. recoverable spacecraft  
. Mercury spacecraft  
. **Aurora 7**  
soft landing spacecraft  
. Mercury spacecraft

. **Aurora 7**  
space capsules  
. Mercury spacecraft  
. **Aurora 7**  
RT Mercury MA-7 flight

### auroral absorption

GS attenuation  
. atmospheric attenuation  
. **auroral absorption**  
energy absorption  
. radiation absorption  
. electromagnetic absorption  
. **auroral absorption**  
RT ∞ absorption  
light emission  
riometers

### auroral activity

USE **auroras**

### auroral arcs

GS atmospheric radiation  
. auroras  
. **auroral arcs**  
. red arcs  
RT ∞ arcs

### auroral echoes

GS echoes  
. **auroral echoes**  
RT radar echoes  
radio echoes

### auroral electrojets

GS electric current  
. ionospheric currents  
. electrojets  
. **auroral electrojets**  
electricity  
. atmospheric electricity  
. ionospheric currents  
. electrojets  
. **auroral electrojets**  
RT Birkeland currents  
equatorial electrojet  
telluric currents

### auroral ionization

GS ionization  
. gas ionization  
. atmospheric ionization  
. **auroral ionization**  
RT auroras  
excitation  
light emission  
photoionization  
red arcs

### auroral irradiation

GS irradiation  
. **auroral irradiation**  
RT auroras  
electron irradiation  
excitation  
ion irradiation  
photoionization

### auroral spectroscopy

GS spectroscopy  
. **auroral spectroscopy**  
RT channel multipliers  
Fabry-Perot spectrometers  
light emission  
optical emission spectroscopy  
spectroscopic analysis  
visible spectrum

### auroral temperature

GS temperature  
. atmospheric temperature  
. **auroral temperature**  
RT auroras  
ion temperature  
ionospheric temperature

### auroral zones

DEF Roughly circular bands around either geomagnetic pole above which there is a maximum of auroral activity. The zones lie about 10

deg. to 15 deg. of geomagnetic latitude from the geomagnetic poles.

GS regions  
. **auroral zones**

RT auroras  
Birkeland currents  
IMAGE satellite  
magnetic poles  
Pedersen currents  
polar radio blackout  
polar regions

### auroras

DEF Sporadic radiant emissions from the upper atmosphere over middle and high latitudes. Used for auroral activity and polar auroras.

UF *auroral activity*  
*polar auroras*  
GS atmospheric radiation  
. **auroras**  
. auroral arcs  
. red arcs  
. radio auroras  
RT aeronomy  
airglow  
auroral ionization  
auroral irradiation  
auroral temperature  
auroral zones  
dawn chorus  
Earth atmosphere  
electron precipitation  
ESRO 4 satellite  
Juno mission  
light emission  
magnetic disturbances  
night sky  
Polar/GGS spacecraft  
proton precipitation  
sky brightness  
solar activity  
x rays

### ausforming

GS forming techniques  
. hot working  
. **ausforming**  
metal working  
. **ausforming**  
RT forging  
∞ rolling

### austenite

DEF A solid solution of carbon in gamma-iron.  
RT allotropy  
ferrites  
iron alloys  
martensite  
martensitic transformation  
microstructure  
steels

### austenitic stainless steels

DEF Steels having at room temperature a microstructure consisting, at least predominantly, of austenite. Their austenitic microstructure is attained above all by alloying conditions, e.g., manganese and nickel.

GS alloys  
. iron alloys  
. steels  
. stainless steels  
. **austenitic stainless steels**  
RT martensitic stainless steels  
time temperature parameter

### Austin comet

(added May 1991)  
GS celestial bodies  
. comets  
. **Austin comet**

### Australia

GS continents  
. **Australia**  
nations  
. **Australia**  
RT Australian space program

Papua New Guinea  
Tasmania  
Torres Strait

**Australian space program**  
(added February 1989)  
GS programs  
. space programs  
. . **Australian space program**

RT Australia

**australites**  
GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . tektites  
. . . . **australites**

RT bediasites

**Austria**  
GS nations  
. **Austria**

RT Alps Mountains (Europe)  
Austrian space program  
Central Europe  
Europe

**Austrian space program**  
(added October 1990)  
GS programs  
. space programs  
. . European space programs  
. . . **Austrian space program**

RT Austria

**autocatalysis**  
GS catalysis  
. **autocatalysis**

RT abiogenesis  
catalytic activity  
reaction kinetics

**autoclaves**  
RT autoclaving  
chemical reactors

∞ containers  
pressure vessels

**autoclaving**  
RT autoclaves  
curing  
heating  
leaching  
powder metallurgy

**autocoders**  
GS languages  
. programming languages  
. . Assembly language  
. . . **autocoders**

RT compilers  
computer programming  
computer systems programs  
machine oriented languages

*autocollimators*  
USE **collimators**

**autocorrelation**  
DEF In statistics, the simple linear internal correlation of members of a time series (ordered in time or other domains).  
GS correlation  
. **autocorrelation**

RT cross correlation  
data correlation  
Fourier analysis  
periodic variations  
time series analysis

**autodynes**  
GS circuits  
. **autodynes**  
oscillators  
. **autodynes**

RT ∞ detectors  
frequency control  
heterodyning  
signal analyzers  
signal detection  
signal detectors

vacuum tube oscillators

**autogyros**  
GS V/STOL aircraft  
. rotary wing aircraft  
. . **autogyros**  
. . . Avian 2/180 autogiro

*autoignition*  
(added April 1997)  
USE **spontaneous combustion**

**autoionization**  
GS dissociation  
. **autoionization**  
ionization  
. **autoionization**

RT atomic collisions  
many electron effects

**autokinesis**  
GS perception  
. sensory perception  
. . proprioception  
. . . **autokinesis**  
. . visual perception  
. . . space perception  
. . . . **autokinesis**

**automata theory**  
RT adaptive control  
artificial intelligence

∞ automation  
bionics  
cellular automata  
computers  
cybernetics  
depersonalization  
heuristic methods  
information theory  
machine learning  
model reference adaptive control  
robotics  
robots  
self adaptive control systems

∞ theories  
Turing machines

**automated en route ATC**  
DEF An air traffic control technology which allows computers to make decisions about conflict resolution, the generation of clearances, and their automatic transmission, with the operator standing by to take over in an emergency.  
GS ground based control  
. air traffic control  
. . **automated en route ATC**  
traffic control  
. air traffic control  
. . **automated en route ATC**

RT aircraft guidance  
approach control  
automated pilot advisory system  
flight control  
ground-air-ground communication  
microwave landing systems

**automated guideway transit vehicles**  
DEF A system of a large number of captive vehicles traveling at relatively close headways on an exclusive guideway controlled by a computer. Used for AGT.  
UF **AGT**

GS surface vehicles  
. automated transit vehicles  
. . **automated guideway transit vehicles**

RT automated mixed traffic vehicles  
conveyors  
passengers  
rail transportation  
rapid transit systems  
transportation  
urban transportation

∞ vehicles

**automated mixed traffic vehicles**  
DEF Low speed, surface vehicles automatically operated and controlled in a pedestrian environment by following a buried wire in the

roadways sensing obstacles and stopping at predetermined spots for passenger exit and entry. Used for AMTV.  
UF **AMTV**

GS research vehicles  
. **automated mixed traffic vehicles**  
surface vehicles  
. motor vehicles  
. . **automated mixed traffic vehicles**

RT automated guideway transit vehicles  
passengers  
urban transportation

∞ vehicles

**automated pilot advisory system**  
DEF An airport advisory system and an air traffic advisory system designed to improve airport and air traffic advisories at high density uncontrolled airports.  
RT air traffic control  
automated en route ATC  
automatic traffic advisory and resolution

∞ systems

**automated radar terminal system**  
DEF Radar tracking system for use in a terminal area. Primary and secondary radar targets are detected and data for the two are correlated for transmission to a central computer.  
RT air traffic control  
radar equipment  
radar tracking

∞ systems

**Automated Transfer Vehicle**  
(added December 1995)  
RT Ariane 5 launch vehicle  
cargo spacecraft  
Columbus space station  
rendezvous guidance  
space logistics

∞ vehicles

**automated transit vehicles**  
GS surface vehicles  
. **automated transit vehicles**  
. . automated guideway transit vehicles

RT conveyors  
electric motor vehicles  
passengers  
rail transportation  
rapid transit systems  
transportation  
urban transportation

∞ vehicles

**automatic control**  
DEF Control of devices and equipment, including aerospace vehicles by automatic means. Used for self regulating.  
UF *self regulating*

GS **automatic control**  
. adaptive control  
. . active control  
. . model reference adaptive control  
. . self adaptive control systems  
. automatic flight control  
. . automatic landing control  
. automatic frequency control  
. automatic gain control  
. dynamic control  
. feedback control  
. . cascade control  
. feedforward control  
. numerical control  
. off-on control  
. optimal control  
. . H-2 control  
. . H-infinity control  
. . linear quadratic Gaussian control  
. . time optimal control  
. proportional control  
. sequential control

RT aircraft control  
attitude control

∞ automation  
autonomous docking

## automatic control valves

combustion control  
 ∞ control  
 control equipment  
 control systems design  
 controllers  
 depersonalization  
 directional control  
 dynamic characteristics  
 electric control  
 electronic aircraft  
 electronic control  
 engine control  
 environmental control  
 flight control  
 ground based control  
 guidance (motion)  
 helicopter control  
 hydraulic control  
 ∞ instruments  
 jet control  
 landing instruments  
 lateral control  
 longitudinal control  
 manual control  
 measuring instruments  
 missile control  
 negative feedback  
 optical control  
 pneumatic control  
 radio control  
 real time operation  
 recording instruments  
 reentry guidance  
 regulators  
 relief valves  
 remote control  
 robotics  
 rocket engine control  
 sampled data systems  
 satellite attitude control  
 satellite control  
 satellite guidance  
 self absorption  
 self alignment  
 servocontrol  
 servomechanisms  
 servomotors  
 spacecraft control  
 spacecraft guidance  
 speed control  
 stability augmentation  
 temperature control  
 Terminal Configured Vehicle Program  
 thermostats  
 thrust vector control  
 tracking problem  
 transfer functions  
 turbojet engine control

### automatic control valves

GS control equipment  
 . regulators  
 . . **automatic control valves**  
 . . . pressure regulators  
 . . . relief valves  
 valves  
 . **automatic control valves**  
 . . pressure regulators  
 . . relief valves  
 RT actuators  
 ∞ control  
 dampers (valves)  
 dynamic characteristics  
 fluid amplifiers  
 fluid switching elements  
 gas valves  
 hydraulic equipment  
 pneumatic control  
 servomechanisms  
 solenoid valves  
 temperature control

### automatic data processing

USE **data processing**

### automatic flight control

UF *AFCS (control system)*  
 GS automatic control  
 . **automatic flight control**  
 . . automatic landing control

flight control  
 . **automatic flight control**  
 . . automatic landing control  
 RT aircraft control  
 aircraft instruments  
 autonomous navigation  
 ∞ control  
 distance measuring equipment  
 flight management systems  
 highly maneuverable aircraft  
 missile control  
 navigation  
 navigation aids  
 radar navigation  
 radio navigation  
 solar compasses  
 Terminal Configured Vehicle Program  
 thrust vector control

### automatic frequency control

DEF An arrangement whereby the frequency of an oscillator is automatically maintained within specified limits. Used for AFC (control).

UF *AFC (control)*  
 GS automatic control  
 . **automatic frequency control**  
 frequency control  
 . **automatic frequency control**  
 RT ∞ control  
 feedback control  
 frequency modulation  
 oscillators  
 tuning

### automatic gain control

DEF A process by which gain is automatically adjusted as a function of input or other specified parameter. Used for AGC (control).

UF *AGC (control)*  
 GS automatic control  
 . **automatic gain control**  
 RT antenna gain  
 ∞ control  
 feedback control  
 tuning

### automatic indexing

(added April 2000)

USE **indexing (information science)**

### automatic landing control

GS automatic control  
 . automatic flight control  
 . . **automatic landing control**  
 flight control  
 . automatic flight control  
 . . **automatic landing control**  
 RT airborne equipment  
 aircraft equipment  
 blind landing  
 distance measuring equipment  
 flight management systems  
 instrument landing systems  
 microwave landing systems  
 Terminal Configured Vehicle Program

### automatic pattern recognition

USE **pattern recognition**

### automatic picture transmission

UF *APT (picture transmission)*  
 GS telecommunication  
 . communication  
 . . facsimile communication  
 . . . **automatic picture transmission**  
 transmission  
 . signal transmission  
 . . data transmission  
 . . . **automatic picture transmission**  
 RT television transmission  
 wave propagation

### automatic pilots

DEF Equipment which automatically stabilizes the attitude of a vehicle about its pitch, roll, and yaw axes. Used for autopilots.

UF *autopilots*  
 GS aircraft instruments  
 . **automatic pilots**

flight instruments  
 . **automatic pilots**  
 RT aircraft equipment  
 flight control  
 gyroscopes  
 highly maneuverable aircraft  
 homing  
 landing aids  
 navigation aids  
 pilot support systems  
 ∞ pilots  
 radio altimeters  
 solar compasses

### automatic repeat query

USE **automatic repeat request**

### automatic repeat request

(added August 1991)

DEF A request from a receiving device to retransmit the most recent block of data.

UF *ARQ (communication)*  
*automatic repeat query*  
*automatic request for retransmission*  
 RT data transmission  
 error correcting codes  
 error signals  
 message processing  
 messages  
 packet transmission  
 telecommunication

### automatic request for retransmission

USE **automatic repeat request**

### automatic rocket impact predictors

USE **computerized simulation**  
**impact prediction**

### automatic test equipment

RT ∞ equipment  
 measuring instruments  
 self tests  
 sneak circuit analysis  
 ∞ test equipment

### automatic traffic advisory and resolution

SN (AUTOMATIC TRAFFIC ADVISORY AND RESOLUTION SERVICE)  
 DEF Ground based collision avoidance system using the surveillance and data link capabilities of the discrete address beacon system (DABS). Used for ATARS.

UF *ATARS*  
 RT automated pilot advisory system  
 collision avoidance  
 ground based control  
 navigation aids  
 resolution  
 ∞ systems

### automatic typewriters

UF *Flexowriters (trademark)*  
 GS typewriters  
 . **automatic typewriters**  
 RT consoles  
 display devices  
 printers (data processing)  
 punched tapes

### Automatic Universal Orbiting Stations

(added September 1994)

UF *AUOS*  
 GS artificial satellites  
 . space stations  
 . . **Automatic Universal Orbiting Stations**  
 stations  
 . space stations  
 . . **Automatic Universal Orbiting Stations**  
 RT ∞ platforms  
 Russian Federation  
 spacecraft environments  
 U.S.S.R. space program

### automatic weather stations

DEF Weather stations at which the services of observers are not required. They are usually equipped with telemetric apparatus.

GS stations

- . weather stations
- . . **automatic weather stations**
- RT data acquisition
- data collection platforms
- instrument packages
- meteorological services
- ocean data acquisitions systems
- remote sensors
- weather data recorders
- ∞ **automation**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *instrumental analysis*
- RT automata theory
- automatic control
- command and control
- computer vision
- computers
- control systems design
- controllers
- cybernetics
- data processing
- depersonalization
- fail-safe systems
- feedback control
- feedforward control
- information theory
- man machine systems
- materials handling
- mechanization
- numerical control
- office automation
- remote control
- robotics
- self erecting devices
- self repairing devices
- servomechanisms
- systems engineering
- tooling
- automobile accidents**
- GS accidents
- . **automobile accidents**
- RT accident investigation
- accident prevention
- safety devices
- automobile engines**
- RT external combustion engines
- internal combustion engines
- piston engines
- rotary engines
- Stirling engines
- turbine engines
- Wankel engines
- automobile fuels**
- GS fuels
- . **automobile fuels**
- RT aircraft fuels
- antiknock additives
- diesel fuels
- gasoline
- hydrocarbon fuels
- internal combustion engines
- liquid fuels
- synthane
- automobiles**
- UF *jeeps*
- GS surface vehicles
- . motor vehicles
- . . **automobiles**
- . . . electric automobiles
- RT air bag restraint devices
- antiskid devices
- chassis
- electric hybrid vehicles
- electric motor vehicles
- fuel systems
- hydrogen engines
- ignition systems
- lubrication systems
- ∞ military vehicles
- trailers
- trucks
- ∞ vehicles
- automorphisms**
- GS algebra
- . group theory
- . . homomorphisms
- . . . **automorphisms**
- autonomic nervous system**
- GS anatomy
- . nervous system
- . . **autonomic nervous system**
- . . . sympathetic nervous system
- RT involuntary actions
- ∞ systems
- autonomous docking**
- (added May 2005)
- DEF Automatic, self-controlled docking enabled through the use of specialized hardware, sensors, and algorithms for navigation, guidance, and positioning.
- GS maneuvers
- . docking
- . . **autonomous docking**
- RT automatic control
- autonomous navigation
- interception
- mooring
- orbital rendezvous
- rendezvous guidance
- space rendezvous
- space stations
- spacecraft docking
- spacecraft guidance
- terminal guidance
- unmanned spacecraft
- autonomous navigation**
- GS navigation
- . **autonomous navigation**
- RT automatic flight control
- autonomous docking
- celestial navigation
- Deep Space 1 Mission
- navigation aids
- navigation instruments
- satellite navigation systems
- space navigation
- spacecraft guidance
- unmanned ground vehicles
- autonomous spacecraft clocks**
- DEF Standard Time scale instruments aboard spacecraft with provisions for synchronization with existing satellite-based system (global positioning system, for example).
- GS measuring instruments
- . time measuring instruments
- . . clocks
- . . . **autonomous spacecraft clocks**
- RT atomic clocks
- Global Positioning System
- spacecraft instruments
- TDR satellites
- autonomy**
- RT adaptive control
- command and control
- ∞ commands
- ∞ direction
- equations of motion
- management
- model reference adaptive control
- self adaptive control systems
- autopilots*
- USE **automatic pilots**
- autopsies**
- RT dissection
- pathology
- autoradiography**
- DEF A technique that uses x ray film to visualize radioactively labeled molecules or fragments of molecules used in analyzing the length and number of DNA fragments separated by gel electrophoresis.
- GS imagery
- . photography
- . . **autoradiography**
- . radiography
- . . **autoradiography**
- RT black and white photography
- autoregressive moving average**
- (added October 1997)
- UF *ARMA (mathematics)*
- GS average
- . **autoregressive moving average**
- RT autoregressive processes
- estimating
- IIR filters
- regression analysis
- stochastic processes
- time series analysis
- autoregressive processes**
- RT autoregressive moving average
- factor analysis
- ∞ processes
- regression analysis
- statistical analysis
- autorotation**
- DEF A rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.
- UF *windmilling*
- GS gyration
- . rotation
- . . **autorotation**
- RT rotary wing aircraft
- rotouchutes
- autotrophs**
- DEF Organisms capable of synthesizing organic nutrients directly from simple inorganic substances such as carbon dioxide and inorganic nitrogen.
- GS **autotrophs**
- . hydrogenomonas
- RT heterotrophs
- autumn**
- DEF The season of the year between summer and winter. Its beginning is marked by the autumnal equinox and its end by the winter solstice.
- GS seasons
- . **autumn**
- RT spring (season)
- summer
- winter
- auxiliary equipment (computers)*
- USE **peripheral equipment (computers)**
- auxiliary power sources**
- GS **auxiliary power sources**
- . chemical auxiliary power units
- . nuclear auxiliary power units
- . . SNAP
- . . . fission electric cells
- . . . SNAP 2
- . . . SNAP 4
- . . . SNAP 8
- . . . SNAP 10A
- . . . SNAP 1
- . . . SNAP 3
- . . . SNAP 7
- . . . SNAP 9A
- . . . SNAP 11
- . . . SNAP 13
- . . . SNAP 15
- . . . SNAP 17
- . . . SNAP 19
- . . . SNAP 21
- . . . SNAP 23
- . . . SNAP 27
- . . . SNAP 29
- . . . SNAP 50
- . . space power reactors
- . . . fission electric cells
- . . . SNAP 2
- . . . SNAP 4
- . . . SNAP 8
- . . . SNAP 10A
- . . . SNAP 50

## auxiliary propulsion

- . . . space power unit reactors
- . solar auxiliary power units
- . . . ASTEC solar turboelectric generator
- RT aircraft power supplies
- direct power generators
- electric batteries
- electric generators
- ∞ electric power
- electric power supplies
- ∞ energy sources
- ground support equipment
- ∞ power supplies
- spacecraft power supplies
- voltage converters (AC to AC)
- voltage converters (DC to DC)

### auxiliary propulsion

- GS propulsion
- . **auxiliary propulsion**
- RT aeronautical engineering
- ∞ astronautics
- engines
- hydrogen oxygen engines
- Marquardt R4D engine
- missiles
- propellants
- propulsion system configurations
- rocket propellants
- space flight
- space shuttles
- space station propulsion
- ∞ spacecraft
- thrust

### auxins

- (added August 2004)
- DEF Plant hormones which promote tissue growth through cell elongation rather than multiplication.
- GS plant growth regulators
- . **auxins**
- RT gravitropism
- plant physiology
- plant roots
- plants (botany)

### AV-8A aircraft

- USE **Harrier aircraft**

### AV-8B aircraft

- USE **Harrier aircraft**

### availability

- GS **availability**
- . bioavailability
- abundance
- energy policy
- reserves
- resources

### avalanche diodes

- DEF A solid state device that takes advantage of avalanche multiplication of the photocurrent.
- UF *IMPATT diodes*
- TRAPATT diodes*
- Zener diodes*
- GS electronic equipment
- . diodes
- . . . semiconductor diodes
- . . . . **avalanche diodes**
- . . . . cryosar
- . solid state devices
- . . . semiconductor devices
- . . . . **avalanche diodes**
- . . . . cryosar
- rectifiers
- . **avalanche diodes**
- . . cryosar
- RT Barritt diodes
- ion implantation
- negative conductance
- TRAPATT devices
- voltage regulators

### avalanches

- GS **avalanches**
- . electron avalanche
- . Townsend avalanche

- RT Earth movements
- electric discharges
- ion production rates
- ionizing radiation

### AVCS

- USE **Advanced Vidicon Camera System (AVCS)**

### average

- GS **average**
- . autoregressive moving average
- . mean
- RT distribution moments
- median (statistics)
- mode (statistics)
- normality
- norms
- quality control
- Reynolds averaging

### AVHRR

- USE **Advanced Very High Resolution Radiometer**

### Avian 2/180 autogiro

- GS research vehicles
- . research aircraft
- . . **Avian 2/180 autogiro**
- V/STOL aircraft
- . rotary wing aircraft
- . . autogyros
- . . . **Avian 2/180 autogiro**

### aviation

- USE **aeronautics**

### aviation meteorology

- DEF Weather conditions and meteorological studies pertaining to aeronautics.
- GS meteorology
- . **aviation meteorology**
- RT aircraft accident investigation
- aircraft accidents
- aircraft hazards
- aircraft icing
- atmospheric turbulence
- civil aviation
- clear air turbulence
- downbursts
- flight conditions
- flight hazards
- flight safety
- fog
- meteorological parameters
- meteorological services
- microbursts (meteorology)
- ∞ military aviation
- nowcasting
- numerical weather forecasting
- runway conditions
- wind shear

### aviation psychology

- GS medical science
- . aerospace medicine
- . . **aviation psychology**
- psychology
- . **aviation psychology**
- RT aircraft pilots
- military psychology
- pilot training
- psychological effects
- psychological factors
- space psychology

### aviators

- USE **aircraft pilots**

### avionics

- DEF The use of electronics in all its forms in airborne or aerospace vehicles.
- RT ∞ aeronautics
- airborne equipment
- aircraft communication
- aircraft equipment
- aircraft instruments
- astrionics
- ∞ astronautics
- ∞ control

- ∞ electronics
- flat panel displays
- flight management systems
- guidance (motion)
- head-up displays
- modularity
- pilot support systems
- self tests
- single event upsets
- systems integration
- ∞ test equipment
- video landmark acquisition and tracking

### avoidance

- GS **avoidance**
- . collision avoidance
- . . Beacon Collision Avoidance System
- . vortex avoidance
- RT accident prevention
- hazards
- traffic
- traffic control
- warning systems

### AVRO 698 aircraft

- USE **Vulcan aircraft**

### AVRO 707 aircraft

- GS Hawker Siddeley aircraft
- . **AVRO 707 aircraft**
- jet aircraft
- . **AVRO 707 aircraft**
- monoplanes
- . **AVRO 707 aircraft**
- research vehicles
- . research aircraft
- . . **AVRO 707 aircraft**
- tailless aircraft
- . **AVRO 707 aircraft**
- RT ∞ aircraft
- delta wings
- Vulcan aircraft

### AVRO Whitworth HS-748 aircraft

- USE **HS-748 aircraft**

### AWACS aircraft

- UF *Airborne Warning and Control System*
- GS **AWACS aircraft**
- . E-2 aircraft
- . E-3A aircraft
- . E-4 aircraft
- RT ∞ aircraft
- Boeing aircraft
- command and control
- early warning systems
- Grumman aircraft
- ∞ military aircraft
- military technology

### awards

- SN (EXCLUDES CONTACTS & GRANTS)
- DEF Distinctions that are bestowed upon a person or persons due to their special contributions to a field.
- RT astronauts
- biography
- engineers
- scientists

### AXAF

- USE **X Ray Astrophysics Facility**

### axes (coordinates)

- USE **coordinates**

### axes (reference lines)

- GS **axes (reference lines)**
- . axes of rotation
- . . Earth axis
- RT coordinates

### axes of rotation

- GS axes (reference lines)
- . **axes of rotation**
- . . Earth axis
- RT bodies of revolution
- rotating bodies
- rotation

- shafts (machine elements)  
symmetrical bodies
- axial compression loads**  
GS loads (forces)  
. axial loads  
. . **axial compression loads**  
. compression loads  
. . **axial compression loads**  
RT aerodynamic loads  
compressing  
dynamic loads  
shock loads  
static loads  
structural design criteria  
thrust loads
- axial compressors*  
USE **turbocompressors**
- axial flow**  
GS fluid flow  
. **axial flow**  
RT annular flow  
axisymmetric flow  
coaxial flow  
coaxial nozzles  
counterflow  
discharge coefficient  
flow geometry  
one dimensional flow  
radial flow  
three dimensional flow  
two dimensional flow
- axial flow compressors*  
USE **turbocompressors**
- axial flow pumps**  
GS pumps  
. **axial flow pumps**  
. . turbine pumps  
RT centrifugal pumps  
fuel pumps
- axial flow turbines**  
GS turbomachinery  
. turbines  
. . **axial flow turbines**  
RT gas turbine engines  
gas turbines  
steam turbines
- axial loads**  
GS loads (forces)  
. **axial loads**  
. . axial compression loads  
RT aerodynamic loads  
compression loads  
dynamic loads  
static loads  
structural design criteria  
thrust loads
- axial modes**  
DEF Regimes of vibration along a given axis.  
GS modes  
. **axial modes**  
RT combustion stability  
laser modes  
propellant combustion  
rocket engines
- axial strain**  
DEF Linear strain in a plane parallel to the longitudinal axis of the specimen. Used for axisymmetric deformation and uniaxial strain.  
UF *axisymmetric deformation*  
*uniaxial strain*  
GS deformation  
. **axial strain**  
RT elastic deformation  
Euler-Bernoulli beams  
stress-strain diagrams
- structural strain
- axial stress**  
GS stresses  
. **axial stress**  
RT tensile stress
- axioms**  
UF *postulates*  
GS mathematical logic  
. **axioms**  
RT knowledge  
 $\infty$  logic  
 $\infty$  mathematics
- axisymmetric bodies**  
GS symmetrical bodies  
. **axisymmetric bodies**  
. . power law bodies  
RT blunt bodies  
 $\infty$  bodies  
bodies of revolution  
conical bodies  
ducted bodies  
lenticular bodies  
missile bodies  
slender bodies  
slender cones  
streamlined bodies
- axisymmetric deformation*  
USE **axial strain**
- axisymmetric flow**  
GS fluid flow  
. **axisymmetric flow**  
. . annular flow  
. . Karman-Bodewadt flow  
RT axial flow  
coaxial flow  
conical flow  
Couette flow  
Crocco method  
cylindrical waves  
flow geometry  
helical flow  
three dimensional boundary layer
- axisymmetry*  
USE **symmetry**
- axles*  
USE **shafts (machine elements)**
- axons**  
GS cells (biology)  
. neurons  
. . **axons**  
RT myelin sheath  
nerve fibers  
neurotransmitters
- azeotropes**  
RT binary mixtures  
mixtures  
solutions
- Azerbaijan**  
(added August 1993)  
GS nations  
. **Azerbaijan**  
RT Asia  
Europe
- azides (inorganic)**  
GS nitrogen compounds  
. **azides (inorganic)**  
. . hydrogen azides  
. . sodium azides
- azides (organic)**  
GS nitrogen compounds  
. **azides (organic)**  
. . sodium azides  
. . triaminoguanidinium azide
- RT explosives
- azimuth**  
DEF Horizontal direction or bearing. Used for solar azimuth.  
UF *solar azimuth*  
RT altitude  
angles (geometry)  
astronomical coordinates  
bearing (direction)  
celestial reference systems  
 $\infty$  direction  
elevation angle  
look angles (tracking)  
navigation  
 $\infty$  orientation  
position (location)
- azines**  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **azines**  
. . . . cyanurates  
. . . . cyanuric acid  
. . . . meclizine  
. . . . methylene blue  
. . . . phenothiazines  
pyrazines  
. **azines**  
. . cyanurates  
. . cyanuric acid  
. . meclizine  
. . methylene blue  
. . phenothiazines  
RT dyes
- azo compounds**  
GS nitrogen compounds  
. **azo compounds**  
. . HMX  
. . RDX  
RT  $\infty$  chemical compounds  
dyes
- azoles**  
DEF Compounds that contain a five-membered heterocyclic ring containing one or more nitrogen atoms.  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **azoles**  
. . . . acetazolamide  
. . . . oxazole  
. . . . pyrroles  
. . . . carbazoles
- Azores**  
(added July 1991)  
GS landforms  
. islands  
. . **Azores**  
nations  
. Portugal  
. . **Azores**  
RT Atlantic Ocean
- Azotobacter**  
GS microorganisms  
. bacteria  
. . **Azotobacter**
- azulene**  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **azulene**  
terpenes  
. **azulene**
- Azur satellite**  
GS artificial satellites  
. scientific satellites  
. . **Azur satellite**  
RT European space programs  
international cooperation  
West Germany



# B

## B stars

- UF *helium stars*
- GS celestial bodies
  - . stars
  - . . . early stars
  - . . . . hot stars
  - . . . . . **B stars**
  - . . . . . shell stars
  - . . . . . Sigma Orionis
- RT blue stars
  - Herbig-Haro objects
  - limb brightening
  - limb darkening
  - peculiar stars
  - Population I stars
  - stellar composition
  - Wolf-Rayet stars

## B-1 aircraft

- GS attack aircraft
  - . bomber aircraft
  - . . **B-1 aircraft**
  - jet aircraft
  - . **B-1 aircraft**
  - North American aircraft
  - . **B-1 aircraft**
- RT  $\infty$  aircraft
  - bombing equipment
  - bombs (ordnance)
  - combat
  - $\infty$  military aircraft
  - multiengine vehicles
  - warfare
  - $\infty$  winged vehicles

## B-2 aircraft

- (added September 1992)
- UF *stealth bomber*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-2 aircraft**
  - jet aircraft
  - . **B-2 aircraft**
- RT  $\infty$  aircraft
  - $\infty$  military aircraft
  - stealth technology
  - X-36 aircraft

## B-26 aircraft

- UF *Invader aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-26 aircraft**
  - Martin aircraft
  - . **B-26 aircraft**
  - monoplanes
  - . **B-26 aircraft**
- RT  $\infty$  aircraft

## B-47 aircraft

- UF *FB-47 aircraft*
- Stratojet aircraft*
- XB-47 aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-47 aircraft**
  - Boeing aircraft
  - . **B-47 aircraft**
  - jet aircraft
  - . **B-47 aircraft**
  - monoplanes
  - . **B-47 aircraft**
- RT  $\infty$  aircraft

## B-50 aircraft

- UF *FB-50 aircraft*
- superfortress aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-50 aircraft**
  - Boeing aircraft
  - . **B-50 aircraft**
  - monoplanes
  - . **B-50 aircraft**
- RT  $\infty$  aircraft

## B-52 aircraft

- UF *Stratofortress aircraft*
- GS attack aircraft

- . bomber aircraft
- . . **B-52 aircraft**
- Boeing aircraft
- . **B-52 aircraft**
- jet aircraft
- . **B-52 aircraft**
- monoplanes
- . **B-52 aircraft**
- RT  $\infty$  aircraft
- Pegasus air-launched booster
- turbofan engines

## B-57 aircraft

- UF *Canberra bomber*
- RB-57 aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-57 aircraft**
  - jet aircraft
  - . **B-57 aircraft**
  - Martin aircraft
  - . **B-57 aircraft**
  - monoplanes
  - . **B-57 aircraft**
- RT  $\infty$  aircraft
- Canberra aircraft

## B-58 aircraft

- UF *Hustler aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-58 aircraft**
  - General Dynamics aircraft
  - . **B-58 aircraft**
  - jet aircraft
  - . **B-58 aircraft**
  - monoplanes
  - . **B-58 aircraft**
  - supersonic aircraft
  - . **B-58 aircraft**
  - tailless aircraft
  - . **B-58 aircraft**
- RT  $\infty$  aircraft

## B-66 aircraft

- UF *Destroyer aircraft*
- RB-66 aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-66 aircraft**
  - jet aircraft
  - . **B-66 aircraft**
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **B-66 aircraft**
  - monoplanes
  - . **B-66 aircraft**
- RT  $\infty$  aircraft

## B-70 aircraft

- UF *Valkyrie aircraft*
- XB-70 aircraft*
- GS attack aircraft
  - . bomber aircraft
  - . . **B-70 aircraft**
  - jet aircraft
  - . **B-70 aircraft**
  - monoplanes
  - . **B-70 aircraft**
  - North American aircraft
  - . **B-70 aircraft**
  - research vehicles
  - . research aircraft
  - . . **B-70 aircraft**
  - supersonic aircraft
  - . **B-70 aircraft**
- RT  $\infty$  aircraft

## B-103 aircraft

- USE **Buccaneer aircraft**

## babbitt metal

- DEF Any of the white alloys composed primarily of tin or lead and of lesser amounts of antimony, copper, and other metals, and used for bearings.
- GS alloys
  - . antimony alloys
  - . . **babbitt metal**

- . copper alloys
- . . **babbitt metal**
- . tin alloys
- . . **babbitt metal**
- RT bearing alloys

## baboons

- GS animals
  - . vertebrates
  - . . mammals
  - . . . primates
  - . . . . **baboons**

## BAC 111 aircraft

- GS BAC aircraft
  - . **BAC 111 aircraft**
  - jet aircraft
  - . turbofan aircraft
  - . . **BAC 111 aircraft**
  - monoplanes
  - . **BAC 111 aircraft**
  - passenger aircraft
  - . **BAC 111 aircraft**
  - transport aircraft
  - . **BAC 111 aircraft**
- RT  $\infty$  aircraft

## BAC aircraft

- UF *British Aircraft Corp aircraft*
- GS **BAC aircraft**
  - . BAC 111 aircraft
  - . Canberra aircraft
  - . H-126 aircraft
  - . jet provost aircraft
  - . Scimitar aircraft
  - . TSR-2 aircraft
  - . Valiant aircraft
  - . VC-10 aircraft
  - . Viscount aircraft
- RT  $\infty$  aircraft

## BAC TSR 2 aircraft

- USE **TSR-2 aircraft**

## Bacillus

- SN (RESTRICTED TO MEMBERS OF THE GENUS BACILLUS; DOES NOT INCLUDE GENERAL MORPHOLOGICAL CLASSIFICATIONS)
- GS microorganisms
  - . bacteria
  - . . **Bacillus**
  - . . . stearothermophilus

## back injuries

- GS injuries
  - . **back injuries**
- RT spinal cord injuries
- whiplash injuries

## backfire

- RT combustion
  - deflagration
  - explosions
  - fires
  - flame deflectors
  - flame propagation
  - flashback

## backfire antennas

- DEF Antennas consisting of radiating feeds, reflector elements, and reflecting surfaces such that the antennas function as open resonators, with radiation from the open end of the resonator.
- GS antennas
  - . **backfire antennas**
- RT antenna radiation patterns
  - dipole antennas
  - endfire arrays
  - microwave antennas
  - radio antennas

## background noise

- DEF In recording and reproducing, the total system noise independent of whether or not a signal is present. The signal is not to be included as part of the noise. In receivers, the noise in the absence of signal modulation on the carrier.
- RT channel noise

cosmic noise  
 elastic waves  
 electromagnetic noise  
 ionospheric noise  
 ∞ noise  
 noise (sound)  
 noise measurement  
 noise spectra  
 noise threshold  
 ∞ radiation  
 random noise  
 ∞ rays  
 signal to noise ratios  
 squelch circuits

**background radiation**

GS **background radiation**  
 . cosmic microwave background radiation  
 RT anticoincidence detectors  
 big bang cosmology  
 continuous radiation  
 corpuscular radiation  
 Cosmic Background Explorer satellite  
 cosmic noise  
 electromagnetic noise  
 extraterrestrial radiation  
 high altitude tests  
 ionospheric noise  
 ∞ radiation  
 relic radiation  
 sky radiation

*backings*

USE **backups**

**backlobes**

DEF Radiation lobes whose axes make angles of approximately 180 degrees with respect to the axes of the major lobes of the antennas. By extension radiation lobes in the half-space opposed to the direction of peak activity.

RT antenna design  
 antenna radiation patterns  
 directional antennas  
 ∞ lobes

**backpropagation (artificial intelligence)**

(added December 2001)

DEF A learning algorithm which minimizes the error function of perceptron neural nets by comparing the actual and desired outputs and adjusting the weights of each neuron layer.

GS mathematical logic  
 . algorithms  
 . . **backpropagation (artificial intelligence)**  
 RT artificial intelligence  
 computer techniques  
 error analysis  
 least squares method  
 machine learning  
 neural nets  
 optimization

**backscattering**

DEF Scattering of radiation in a direction having a component opposite its original direction of propagation.

GS scattering  
 . **backscattering**  
 RT differential absorption lidar  
 forward scattering  
 laser plasma interactions  
 microwave signatures  
 nuclear scattering  
 scatter propagation

*backshores*

USE **beaches**

**backups**

DEF Items kept available to replace items which fail to perform satisfactorily. Items under development intended to perform the same general functions another item also under development performs. Used for backings.

UF *backings*  
 RT redundant components

reserves  
 welding

**backward differencing**

DEF A method of solving a parabolic problem for approximating a time derivative in terms of a previous time step.

RT differential equations  
 numerical stability  
 problem solving

**backward facing steps**

DEF A step structure which faces an oncoming flow. Used for rearward facing steps.

UF *rearward facing steps*  
 RT boundary layer flow  
 flow geometry  
 fluid boundaries  
 forward facing steps  
 reattached flow  
 recirculative fluid flow  
 stairsteps  
 ∞ steps

**backward wave tubes**

GS electron tubes  
 . vacuum tubes  
 . . microwave tubes  
 . . . traveling wave tubes  
 . . . . **backward wave tubes**  
 . . . . . helitrons  
 microwave equipment  
 . microwave tubes  
 . . traveling wave tubes  
 . . . **backward wave tubes**  
 . . . . helitrons  
 RT beam currents  
 electron transfer  
 microwave oscillators

**backward waves**

DEF In traveling wave tubes, waves whose group velocity is opposite to the direction of electron-stream motion.

RT elastic waves  
 electromagnetic radiation  
 solitary waves  
 transmission lines  
 traveling wave tubes  
 traveling waves

**backwash**

SN (EXCLUDES PROCESSES OF BACKWASHING)  
 UF *sidewash*  
 RT boundary layer stability  
 downwash  
 slipstreams  
 Strouhal number  
 turbulence  
 wakes

**bacteria**

GS microorganisms  
 . **bacteria**  
 . . actinomycetes  
 . . archaeobacteria  
 . . Azotobacter  
 . . Bacillus  
 . . . stearothermophilus  
 . . Clostridium  
 . . Clostridium botulinum  
 . . Escherichia  
 . . hydrogenomonas  
 . . Klebsiella  
 . . nitrobacter  
 . . pseudomonas  
 . . salmonella  
 . . sarcina  
 . . serratia  
 . . staphylococcus  
 . . streptococcus  
 . . streptomycetes  
 RT aerobes  
 anaerobes  
 bacteriology  
 biofilms  
 biological weapons  
 blight  
 colonies

eukaryotes  
 gnotobiotics  
 invertebrates  
 panspermia  
 pathogens  
 prokaryotes  
 saprophytes  
 waste treatment

**bacterial diseases**

SN (EXCLUDES PLANT DISEASES)  
 GS diseases  
 . infectious diseases  
 . . **bacterial diseases**  
 . . . cholera  
 . . . diphtheria  
 . . . keratitis  
 . . . syphilis  
 . . . tuberculosis  
 . . . typhoid  
 . . . typhus  
 RT Clostridium  
 conjunctivitis  
 dermatitis  
 encephalitis  
 meningitis  
 nephritis  
 pneumonia

**bactericides**

DEF Agents that destroy microorganisms. Also known as germicides. Used for germicides.

UF *germicides*  
 RT antiinfectives and antibacterials  
 antiseptics  
 chemical sterilization  
 ethylene oxide  
 fumigation  
 sterilization

**bacteriology**

GS microbiology  
 . **bacteriology**  
 RT archaeobacteria  
 bacteria  
 biochemistry  
 ∞ biology  
 Clostridium botulinum  
 colonies  
 endotoxins  
 gnotobiotics  
 vaccines

**bacteriophages**

GS microorganisms  
 . viruses  
 . . **bacteriophages**  
 RT interferon

**badlands**

DEF Intricately stream-dissected topography, characterized by a very fine drainage network with high drainage densities (77 to 747 miles per square mile) and short steep slopes with narrow interflues. Badlands develop on the surface with little or no vegetative cover, overlying unconsolidated or poorly cemented clays or silts, sometimes with soluble minerals such as gypsum or halite. They may also be induced in humid areas by removal of the vegetative cover through overgrazing, or by air pollution from sulfide smelting. The term was first applied to an area in western South Dakota, which was called "mauvaises terres" by the early French fur traders.

GS land  
 . **badlands**  
 RT barren land  
 topography

**baffles**

DEF Plates that regulate the flow of a fluid, e.g., a heat exchanger, boiler flue, or automotive muffler.

RT attenuators  
 ∞ barriers  
 blast deflectors  
 conical flow  
 damping  
 deflectors

## baggage

- ∞ diffusers
- diverters
- dividers
- ducts
- flame deflectors
- liquid sloshing
- louvers
- mixers
- mufflers
- panels
- reflectors
- shielding
- suppressors

### baggage

- GS cargo
  - . **baggage**
- RT air cargo
- bags
- ground handling

### bags

- GS **bags**
  - . air bag restraint devices
  - . gas bags
- RT baggage
- ∞ containers
- packages

### Bahamas

- GS landforms
  - . islands
  - . . West Indies
  - . . . **Bahamas**
  - nations
  - . **Bahamas**
- RT Caribbean region

### Bahrain

- GS landforms
  - . islands
  - . . **Bahrain**
  - nations
  - . **Bahrain**

### bailout

- RT air drop operations
- ejection
- ejection injuries
- ejection seats
- ejection training
- escape (abandonment)
- escape systems
- flying ejection seats
- jettison systems
- jettisoning
- parachute descent
- parafoils

### bainite

DEF Metastable microstructure or microstructures resulting from the transformation of austenite at temperatures between those which produce pearlite and martensite.

- RT bainitic steel
- iron alloys
- microstructure
- steels

### bainitic steel

- GS alloys
  - . iron alloys
  - . . steels
  - . . . **bainitic steel**
- RT bainite

### Baja California

USE **Lower California (Mexico)**

### bajadas

USE **fans (landforms)**

### Bakelite (trademark)

- RT ceramics
- resins

thermosetting resins

### bakeout

USE **degassing**

### Baker-Nunn camera

- GS optical equipment
  - . cameras
  - . . **Baker-Nunn camera**
  - photographic equipment
  - . cameras
  - . . **Baker-Nunn camera**
- RT astronomical photography
- Schmidt cameras

### baking

- SN (EXCLUDES FOOD PROCESSING)
- GS heating
  - . **baking**
- RT casting
- degassing
- drying
- heat treatment
- ovens
- roasting
- sterilization

### balance

- GS **balance**
  - . aerodynamic balance
  - . heat balance
  - . material balance
  - . . water balance
- RT compensators
- ∞ equilibrium
- ∞ mass balance
- mass distribution
- weight indicators

### balance equations

USE **equations**

### balanced amplifiers

USE **push-pull amplifiers**

### balancing

- RT eccentricity
- ∞ equilibrium
- flywheels
- man machine systems
- stabilization

### Baldwin-Lomax turbulence model

(added May 1997)

- GS models
  - . mathematical models
  - . . turbulence models
  - . . . **Baldwin-Lomax turbulence model**
- RT computational fluid dynamics
- eddy viscosity
- flow equations
- turbulent boundary layer
- turbulent flow

### ball bearings

- GS bearings
  - . antifriction bearings
  - . . **ball bearings**
- RT balls
- elastohydrodynamics
- needle bearings
- roller bearings
- thrust bearings

### ball lightning

DEF A relatively rare form of lightning, consisting of a reddish, luminous ball, of the order of one foot in diameter, which may move rapidly along solid objects or remain floating in midair. Hissing noises emanate from such balls, and they sometimes explode noisily but may also appear noiselessly.

- GS electric current
  - . electric discharges
  - . . lightning
  - . . . **ball lightning**

RT atmospheric electricity

### ∞ ballast

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ballast (mass)
- ballasts (impedances)

### ballast (mass)

- RT aerodynamic stability
- ∞ ballast
  - buoyancy
  - counterbalances
  - floating
  - floats
  - hydrodynamics
  - loads (forces)
  - mass distribution
  - stability
  - static loads

### ballasts (impedances)

DEF Devices that by means of inductance, capacitance, or resistance, singly or in combination, limit the lamp current of fluorescent or mercury lamps to the required value for proper operation, and where necessary provide the required starting voltage and current amd. in ballasts for rapid-start lamps provide low-voltage cathode heating.

- RT ∞ ballast
  - capacitors
  - inductors
  - luminaires
  - resistors
  - transformers

### ballistic cameras

DEF Ground-based cameras using multiple exposures on the same plate to record the trajectories of rockets.

- GS optical equipment
  - . cameras
  - . . **ballistic cameras**
  - photographic equipment
  - . cameras
  - . . **ballistic cameras**
- RT ground support equipment
- high speed cameras
- optical tracking
- rangefinding
- stroboscopes
- trajectory measurement

### ballistic missile decoys

- GS countermeasures
  - . **ballistic missile decoys**
  - decoys
  - . **ballistic missile decoys**
- RT missile defense
- reentry decoys

### Ballistic Missile Early Warning System

- UF **BMEWS**
- GS warning systems
  - . early warning systems
  - . . **Ballistic Missile Early Warning System**
- RT air defense
- military technology
- radar tracking
- ∞ systems

### ballistic missile submarines

- GS water vehicles
  - . ships
  - . . submarines
  - . . . **ballistic missile submarines**
  - . underwater vehicles
  - . . submarines
  - . . . **ballistic missile submarines**
- RT fleet ballistic missiles
- missile launchers
- mobile missile launchers
- navy
- Poseidon missiles

- sea launching
- ballistic missiles**  
 SN (GUIDED ONLY DURING INITIAL POWERED PHASE)  
 DEF Missiles designed to operate primarily in accordance with the laws of ballistics.  
 GS missiles  
 . **ballistic missiles**  
 . . field army ballistic missiles  
 . . intercontinental ballistic missiles  
 . . . Atlas ICBM  
 . . . . Atlas D ICBM  
 . . . . Atlas E ICBM  
 . . . . Atlas F ICBM  
 . . . Minuteman ICBM  
 . . . MX missile  
 . . . Titan ICBM  
 . . . . Titan 1 ICBM  
 . . . . Titan 2 ICBM  
 . . intermediate range ballistic missiles  
 . . . Blue Streak missile  
 . . . Jupiter missile  
 . . . polaris missiles  
 . . . . Polaris A1 missile  
 . . . . Polaris A2 missile  
 . . . . Polaris A3 missile  
 . . Pershing missile  
 . . Poseidon missiles  
 . . short range ballistic missiles  
 . . Skybolt missile  
 . . Subroc missile  
 . . V-2 missile  
 RT antimissile missiles  
 Safeguard system  
 surface to surface missiles
- ballistic ranges**  
 GS ranges (facilities)  
 . test ranges  
 . . **ballistic ranges**  
 test facilities  
 . test ranges  
 . . **ballistic ranges**  
 RT downrange  
 hydroballistics  
 missile ranges
- ballistic trajectories**  
 DEF Trajectories followed by a body being acted upon only by gravitational forces and the resistance of the medium through which it passes.  
 GS trajectories  
 . **ballistic trajectories**  
 RT ascent trajectories  
 ballistics  
 coasting flight  
 descent trajectories  
 downrange  
 free fall  
 impact prediction  
 midcourse trajectories  
 missile trajectories  
 parabolic flight
- ballistic vehicles**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 UF *nonlifting vehicles*  
 RT reentry vehicles  
 rocket vehicles  
 test vehicles  
 ∞ vehicles  
 weapons
- ballistics**  
 DEF The science that deals with the motion, behavior and effects of projectiles, especially bullets, aerial bombs, rockets or the like; the science or art of designing and hurling projectiles so as to achieve a desired performance.  
 GS **ballistics**  
 . hydroballistics  
 . interior ballistics  
 . terminal ballistics  
 RT aerodynamic drag  
 ballistic trajectories  
 gas guns  
 howitzers
- hypervelocity guns  
 ordnance  
 projectiles  
 propellants  
 trajectories  
 trajectory analysis  
 trajectory measurement
- ballistocardiography**  
 GS bioengineering  
 . biometrics  
 . . cardiography  
 . . . **ballistocardiography**  
 RT electrocardiography  
 phonocardiography  
 seismocardiography
- balloon flight**  
 RT ∞ flight  
 meteorological flight  
 vertical flight
- balloon sounding**  
 GS sounding  
 . **balloon sounding**  
 RT atmospheric sounding  
 in situ measurement  
 ozonesondes  
 radiosondes  
 superpressure balloons
- balloon-borne instruments**  
 GS measuring instruments  
 . **balloon-borne instruments**  
 RT airborne equipment  
 balloons  
 high altitude balloons  
 meteorological instruments  
 ozonesondes  
 radiosondes  
 telescopes
- ballooning modes**  
 GS modes  
 . **ballooning modes**  
 RT magnetohydrodynamic stability  
 plasma control  
 plasma equilibrium  
 tearing modes (plasmas)
- balloons**  
 GS expandable structures  
 . inflatable structures  
 . . **balloons**  
 . . . high altitude balloons  
 . . . . jimsphere balloons  
 . . . . skyhook balloons  
 . . . . superpressure balloons  
 . . . meteorological balloons  
 . . . . jimsphere balloons  
 . . . . ROBIN balloons  
 . . . microballoons  
 . . . tethered balloons  
 RT ∞ aircraft  
 airships  
 ascent  
 balloon-borne instruments  
 ballutes  
 folding structures  
 gas bags  
 gondolas  
 observation aircraft  
 pilotless aircraft  
 stratoscope telescopes
- balls**  
 RT ball bearings  
 falling spheres  
 joints (junctions)  
 spheres  
 valves
- ballutes**  
 GS brakes (for arresting motion)  
 . aerodynamic brakes  
 . . **ballutes**  
 drag devices  
 . aerodynamic brakes  
 . . **ballutes**  
 expandable structures
- . inflatable structures  
 . . **ballutes**  
 RT air drop operations  
 aircraft brakes  
 balloons  
 drag chutes  
 folding structures  
 parachutes
- Balmer series**  
 GS spectra  
 . radiation spectra  
 . . electromagnetic spectra  
 . . . line spectra  
 . . . . **Balmer series**  
 RT absorption spectra  
 atomic spectra  
 electron transitions  
 emission spectra  
 H beta line  
 H gamma line  
 H lines  
 hydrogen
- balsa**  
 RT trees (plants)  
 wood
- Baltic sea**  
 GS seas  
 . **Baltic sea**  
 RT Estonia  
 Latvia
- Baltic Shield (Europe)**  
 GS rocks  
 . bedrock  
 . . **Baltic Shield (Europe)**  
 RT Earth resources  
 Europe  
 Precambrian period
- Banach space**  
 GS algebra  
 . vector spaces  
 . . **Banach space**  
 . . . Hilbert space  
 . . . . Sobolev space  
 analysis (mathematics)  
 . function space  
 . . **Banach space**  
 . . . Hilbert space  
 . . . . Sobolev space  
 . functional analysis  
 . . **Banach space**  
 . . . Hilbert space  
 . . . . Sobolev space  
 RT harmonic analysis  
 metric space
- band ratioing**  
 GS image processing  
 . **band ratioing**  
 RT image enhancement  
 multispectral band scanners  
 remote sensing  
 spectral bands
- band structure of solids**  
 RT Brillouin zones  
 conduction bands  
 electron transitions  
 electronic structure  
 energy gaps (solid state)  
 forbidden bands  
 heterojunction devices  
 quantum wells
- bandgap*  
 USE **energy gaps (solid state)**
- bandpass filters**  
 DEF Wave filters having a single transmission band; neither of the cut-off frequencies being zero or infinity.  
 GS electromagnetic wave filters  
 . **bandpass filters**  
 . . crystal filters  
 . . tracking filters  
 RT adaptive filters

## bands

bandstop filters  
bandwidth  
electric filters  
∞ filters  
FIR filters  
microwave filters  
optical filters  
ultraviolet filters  
vocoders

### ∞ bands

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT absorption spectra  
anchors (fasteners)  
bandwidth  
Bloch band  
broadband  
clamps  
clips  
conduction bands  
edge dislocations  
energy bands  
fasteners  
forbidden bands  
frequencies  
Herzberg bands  
holders  
low frequencies  
narrowband  
photoluminescent bands  
plastic deformation  
ring structures  
Schumann-Runge bands  
sidebands  
spectral bands  
straps  
Swan bands  
Vegard-Kaplan bands

### bandstop filters

DEF Filters that block signals of a specific frequency or a band of frequencies.

GS electromagnetic wave filters  
. electric filters  
. . . **bandstop filters**

RT adaptive filters  
bandpass filters  
bandwidth  
crystal filters  
∞ filters  
high pass filters  
low pass filters  
microwave filters  
optical filters  
tracking filters  
waveguide filters

### bandwidth

GS **bandwidth**  
. broadband  
. narrowband  
. spectral line width

RT bandpass filters  
∞ bands  
bandstop filters  
broadband amplifiers  
channel capacity  
dynamic characteristics  
frequencies  
frequency ranges  
impedance  
laser windows  
resonant frequencies  
speech baseband compression  
tracking filters  
transfer functions  
width  
windows (intervals)

### bang-bang control

USE **off-on control**

### Bangladesh

UF *East Pakistan*  
GS nations  
. **Bangladesh**  
RT Asia  
India

Pakistan

### banking flight

USE **turning flight**

### Barany chair

DEF A kind of chair in which a person is revolved to test his susceptibility to vertigo. It is named after the Swedish physician Robert Barany who lived from 1876 to 1936.

GS seats  
. **Barany chair**  
RT rotating environments  
tolerances (physiology)  
vertigo

### Barbados

GS landforms  
. islands  
. . West Indies  
. . . **Barbados**  
nations  
. **Barbados**  
RT Caribbean region

### barchans

USE **dunes**

### Bardeen approximation

USE **barrier layers**  
**electrical properties**  
**surface properties**

### Bardeen-Cooper-Schrieffer theory

USE **BCS theory**

### Barents Sea

GS seas  
. **Barents Sea**  
RT Arctic Ocean  
U.S.S.R.

### barite

GS minerals  
. **barite**  
sulfur compounds  
. sulfates  
. . **barite**

### barium

GS chemical elements  
. **barium**  
. . barium isotopes  
metals  
. **barium**  
. . barium isotopes

### barium alloys

GS alloys  
. **barium alloys**

### barium compounds

GS **barium compounds**  
. barium ferrates  
. barium fluorides  
. barium oxides  
. barium sulfides  
. barium titanates  
. barium zirconates  
RT ∞ alkaline earth compounds  
∞ chemical compounds  
∞ metal compounds

### barium ferrates

GS barium compounds  
. **barium ferrates**  
iron compounds  
. ferrates  
. . **barium ferrates**

### barium fluorides

GS barium compounds  
. **barium fluorides**  
halogen compounds  
. fluorine compounds  
. . fluorides  
. . . **barium fluorides**  
. halides  
. . fluorides  
. . . **barium fluorides**  
. . metal halides

. . . **barium fluorides**

### barium ion clouds

GS clouds (meteorology)  
. artificial clouds  
. . chemical clouds  
. . . **barium ion clouds**  
RT Earth magnetosphere  
electric fields  
geomagnetism  
lines of force  
metal ions  
rocket sounding  
thermites

### barium isotopes

GS chemical elements  
. alkaline earth metals  
. . **barium isotopes**  
. barium  
. . **barium isotopes**  
. nuclides  
. . isotopes  
. . . **barium isotopes**  
metals  
. alkaline earth metals  
. . **barium isotopes**  
. barium  
. . **barium isotopes**

### barium oxides

GS barium compounds  
. **barium oxides**  
chalcogenides  
. oxides  
. . metal oxides  
. . . alkaline earth oxides  
. . . . **barium oxides**  
RT high temperature superconductors  
YBCO superconductors

### barium sulfides

GS barium compounds  
. **barium sulfides**  
chalcogenides  
. sulfides  
. . inorganic sulfides  
. . . **barium sulfides**  
sulfur compounds  
. sulfides  
. . inorganic sulfides  
. . . **barium sulfides**

### barium titanates

GS barium compounds  
. **barium titanates**  
titanium compounds  
. titanates  
. . **barium titanates**  
RT dielectrics  
ferroelectric materials

### barium zirconates

GS barium compounds  
. **barium zirconates**  
zirconium compounds  
. zirconates  
. . **barium zirconates**

### Barkhausen effect

RT ∞ effects  
electromagnetic measurement  
electromagnetism  
oscillographs

### barley

GS farm crops  
. grains (food)  
. . **barley**  
plants (botany)  
. **barley**  
RT agriculture  
blight  
botany  
crop growth  
crop vigor  
∞ crops  
∞ food  
irrigation

seeds

proprioceptors

Virgo galactic cluster

**baroclinic instability**

DEF Hydrodynamic instability arising from the existence of a meridional temperature gradient (and hence a thermal wind) in an atmosphere in quasigeostrophic equilibrium and possessing static stability.

GS stability

. **baroclinic instability**

RT atmospheric circulation  
atmospheric models  
baroclinic waves  
baroclinity  
flow stability  
geostrophic wind  
meteorology  
zonal flow (meteorology)

**baroclinic waves**

GS elastic waves

. capillary waves

. . gravity waves

. . . **baroclinic waves**

surface waves

. capillary waves

. . gravity waves

. . . **baroclinic waves**

RT baroclinic instability  
baroclinity  
barotropic flow  
cyclones  
density distribution  
geostrophic wind  
radiation pressure  
stratified flow  
wave amplification

∞ waves  
zonal flow (meteorology)

**baroclinity**

DEF The state of stratification in a fluid in which surfaces of constant pressure (isobaric) intersect surfaces of constant density (isotheric). The number, per unit area, of isobaric-isotheric solenoids intersecting a given surface is a measure of baroclinity.

RT baroclinic instability

baroclinic waves

barotropic flow

barotropism

∞ isobars

meteorological solenoids

stratified flow

**barometers**

DEF Instruments used to measure atmospheric pressure.

GS measuring instruments

. meteorological instruments

. . **barometers**

. pressure gages

. . **barometers**

RT altimeters  
hypsometers  
manometers  
pressure measurement  
vacuum gages

*barometric pressure*USE **atmospheric pressure***baroreceptor reflexes*

(added April 2001)

USE **baroreflexes****baroreceptors**

DEF Receptors in the vascular system, particularly the aorta and carotid sinus, which are sensitive to stretch of the vessel walls.

UF *pressoreceptors*

GS anatomy

. sense organs

. . **baroreceptors**

receptors (physiology)

. **baroreceptors**

RT baroreflexes

pressure

**baroreflexes**

(added March 2001)

DEF A negative feedback system that buffers short-term changes in blood pressure. Increased pressure stretches blood vessels, which activates pressoreceptors (baroreceptors) in the vessel walls. The central nervous system's net response is a reduction of central sympathetic outflow. This reduces blood pressure by decreasing peripheral vascular resistance and by lowering cardiac output. Because the baroreceptors are tonically active, the baroreflex can compensate rapidly for both increases and decreases in blood pressure.

UF *baroreceptor reflexes**pressoreceptor reflexes*

GS reflexes

. **baroreflexes**

. . carotid sinus reflex

RT baroreceptors

blood pressure

cardiovascular system

heart rate

hemodynamic responses

physiological responses

**barotrauma**

GS injuries

. **barotrauma**

RT decompression sickness

diving (underwater)

**barotropic flow**

GS fluid flow

. **barotropic flow**

RT air currents

air flow

baroclinic waves

baroclinity

barotropism

flow characteristics

lee waves

planetary waves

Rayleigh waves

Rossby regimes

sea breeze

viscous flow

wind (meteorology)

wind shear

**barotropism**

DEF The state of a fluid in which surfaces of constant density (or temperature) are coincident with surfaces of constant pressure; it is the state of zero baroclinity.

GS **barotropism**

. planetary waves

RT baroclinity

barotropic flow

∞ isobars

∞ **barrages**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT artillery fire

dams

**barred galaxies**

DEF Spiral galaxies whose nuclei are in the shape of bars at the ends of which the spiral arms begin. About one fifth of all spiral galaxies are barred spirals.

GS celestial bodies

. galaxies

. . spiral galaxies

. . . **barred galaxies**

RT disk galaxies

galactic structure

Hubble diagram

local group (astronomy)

star clusters

star distribution

stars

∞ **barrels**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT barrels (containers)

∞ drums

gun launchers

**barrels (containers)**UF *casks*

RT ∞ barrels

∞ containers

drums (containers)

**barren land**

DEF Rugged or unproductive lands devoid of significant vegetation compared to adjacent areas because of environmental factors such as adverse climate, poor soil, or winds. Used for barrens.

UF *barrens*

GS land

. **barren land**

RT arid lands

badlands

desertification

deserts

land use

Sahara Desert (Africa)

sites

soils

topography

*barrens*USE **barren land***barricades*USE **barriers***barrier injection transit time diodes*USE **Barritt diodes****barrier layers**UF *Bardeen approximation*

RT ∞ barriers

Barritt diodes

interlayers

JFET

joints (junctions)

junction diodes

junction transistors

∞ layers

MBM junctions

nonohmic effect

resonant tunneling

resonant tunneling diodes

seals (stoppers)

semiconductor devices

SIS (semiconductors)

surface layers

tunnel junctions

waterproofing

Zener effect

∞ **barriers**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Any materials limiting passage through itself of solids, liquids, semisolids, gases, or forms of energy such as ultraviolet light. Used for barricades and obstacles.

UF *barricades**obstacles*

RT abort apparatus

acoustic velocity

arresting gear

baffles

barrier layers

barriers (landforms)

Barritt diodes

blood-brain barrier

bulkheads

chains

closures

constrictions

curtains

dams

dividers

## barriers (landforms)

electrode film barriers  
enclosures  
fences (barriers)  
gates (openings)  
guards (shields)  
MBM junctions  
safety devices  
Schottky diodes  
seals (stoppers)  
shielding  
thermal barriers (plasma control)  
vapor barrier clothing  
walls  
wind (meteorology)  
windows (apertures)

### barriers (landforms)

DEF Elongated offshore ridges or masses, usually of sand, rising above the high-tide level, generally extending parallel to, and at some distance from, the shore, and separated from it by some kind of coastal bay. It is built up by the action of waves and currents.

GS landforms  
. **barriers (landforms)**  
. . Outer Banks (NC)  
. . reefs  
RT ∞ barriers  
bars (landforms)  
island arcs

### Barritt diodes

DEF Barrier injection transit time diodes that operate similarly to IMPATT diodes. The operating frequencies are determined by the transit times across the drift. Used for barrier injection transit time diodes.

UF *barrier injection transit time diodes*  
GS electronic equipment  
. diodes  
. . semiconductor diodes  
. . . **Barritt diodes**  
. solid state devices  
. . semiconductor devices  
. . . **Barritt diodes**  
RT avalanche diodes  
barrier layers  
∞ barriers  
carrier injection  
cryosar  
electric potential  
injection  
junction diodes  
microwave oscillators  
rectifiers  
Schottky diodes  
semiconductor junctions  
shot noise  
transit time

### bars

GS **bars**  
. elastic bars  
. prismatic bars  
RT metal plates  
rods  
structural members

### bars (landforms)

DEF A generic term for any of various elongate offshore ridges, banks, or mounds of sand, gravel, or other unconsolidated material, submerged at least at high tides, and built up by the action of waves or currents on the water bottom, especially at the mouth of a river or estuary, or at a slight distance from the beach. Bars commonly form obstructions to water navigation.

UF *tombolos*  
GS landforms  
. **bars (landforms)**  
RT barriers (landforms)  
beaches  
coastal plains  
lagoons  
littoral drift

reefs

### *barycenter*

USE **center of gravity**

### baryon resonance

DEF An anomaly found in scattering cross sections indicating the existence of an unstable, excited state of baryon.

GS resonance  
. **baryon resonance**  
RT baryons  
hyperons  
scattering cross sections

### baryons

GS particles  
. elementary particles  
. fermions  
. . . **baryons**  
. . . . hyperons  
. . . . . xi hyperons  
. . . . . omega-mesons  
. . . . . rho-mesons  
. . . . . sigma-mesons  
. hadrons  
. . . **baryons**  
. . . . hyperons  
. . . . . xi hyperons  
. . . . . omega-mesons  
. . . . . rho-mesons  
. . . . . sigma-mesons  
RT baryon resonance  
cold neutrons  
dark matter  
eta-mesons  
fast neutrons  
gravitinos  
kaons  
meson resonance  
mesons  
muons  
neutrons  
nucleons  
photoneutrons  
pions  
protons  
recoil protons  
solar protons  
thermal neutrons

### basalt

GS rocks  
. igneous rocks  
. . **basalt**  
RT cones (volcanoes)  
lunar maria  
Mars volcanoes  
regolith  
soils  
volcanoes  
volcanology

### base flow

DEF Fluid flow at the base or extreme aft end of a body.

GS fluid flow  
. **base flow**  
RT head flow  
wakes

### base heating

GS heating  
. **base heating**  
RT afterbodies  
convection  
exhaust nozzles  
jet exhaust  
jet impingement  
∞ radiation  
rocket exhaust

### base pressure

DEF In aerodynamics, the pressure exerted on the base, or extreme aft end, of a body, as of a cylindrical or boat-tailed body or of a blunt-trailing-edge wing, in a fluid flow.

GS pressure  
. **base pressure**

RT aerodynamic drag

### basements

RT buildings  
floors  
foundations

### ∞ bases

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT bases (chemical)  
data bases  
foundations  
inorganic compounds  
ion concentration  
lunar bases  
space bases  
stations

### bases (chemical)

GS **bases (chemical)**  
. adenines  
. alkalies  
. lithium hydroxides  
. potassium hydroxides  
. sodium hydroxides  
. alkaloids  
. atropine  
. betaines  
. caffeine  
. colchicine  
. ergotamine  
. hyoscine  
. lysergine  
. morphine  
. nicotinamide  
. nicotine  
. pilocarpine  
. reserpine  
. strychnine  
. . troyl compounds  
. guanines  
. piperidine  
. pyridines  
. quinoline  
. thymidine  
. uracil  
RT alkalinity  
anhydrides  
∞ bases  
buffers (chemistry)  
pH

### *bases (foundations)*

USE **foundations**

### BASIC (programming language)

GS languages  
. programming languages  
. . **BASIC (programming language)**  
RT computer programming

### *basins*

USE **structural basins**

### basins (containers)

RT tanks (containers)

### baskets

RT ∞ containers  
gondolas

### bastnasite

GS carbon compounds  
. carbonates  
. . **bastnasite**  
minerals  
. **bastnasite**  
rare earth compounds  
. cerium compounds  
. . **bastnasite**

### batch processing

GS data processing  
. **batch processing**  
RT computer programming  
computer programs  
data processing equipment

∞ processing

**bathing**

GS cleaning  
 . washing  
 . . **bathing**  
 RT cooling  
 hygiene  
 waste water

**batholiths**

GS rock intrusions  
 . **batholiths**  
 rocks  
 . bedrock  
 . . **batholiths**  
 RT granite  
 igneous rocks

**baths**

SN (EXCLUDES BATHING)  
 GS **baths**  
 . salt baths  
 RT dipping  
 electroplating  
 heat transfer  
 quenching (cooling)  
 ∞ soaking  
 submerging  
 water immersion

**bathymeters**

DEF Instruments that measure the ocean depths and check the topography of the ocean floor. Used for bathymetry.  
 UF *bathymetry*  
 GS measuring instruments  
 . **bathymeters**  
 RT depth measurement  
 oceanography  
 sounding  
 underwater research laboratories

*bathymetry*USE **bathymeters****bathythermographs**

GS measuring instruments  
 . temperature measuring instruments  
 . . **bathythermographs**  
 recording instruments  
 . **bathythermographs**  
 RT pressure gradients  
 temperature gradients

**bats**

GS animals  
 . vertebrates  
 . . mammals  
 . . . **bats**

*batteries*USE **electric batteries****battery chargers**

RT charge efficiency  
 ∞ charging  
 electric batteries  
 pulse charging  
 storage batteries

*battery separators*USE **separators****Bauschinger effect**

RT ∞ effects  
 fatigue (materials)  
 microstructure

**bauxite**

DEF A ferruginous aluminium hydroxide rock consisting of several minerals. It is the principle source for aluminum.  
 RT aluminum oxides  
 minerals

rocks

*B-A-W devices*USE **bulk acoustic wave devices****bay ice**

GS ice  
 . **bay ice**  
 RT freezing  
 frost  
 ice formation  
 ice mapping  
 ice reporting  
 lake ice  
 low temperature  
 navigation  
 oceanography  
 sea ice  
 slush  
 water

**Bayard-Alpert ionization gages**

DEF Ionization vacuum gages using a tube with an electrode structure designed to minimize x ray induced electron emission from the ion collector.

GS measuring instruments  
 . pressure gages  
 . . vacuum gages  
 . . . ionization gages  
 . . . . **Bayard-Alpert ionization gages**  
 vacuum apparatus  
 . vacuum gages  
 . . ionization gages  
 . . . **Bayard-Alpert ionization gages**  
 RT hot cathodes

**Bayes theorem**

UF *Bayesian statistics*  
 GS theorems  
 . **Bayes theorem**  
 RT belief networks  
 quality control  
 sampling

*Bayesian belief networks*USE **belief networks***Bayesian statistics*USE **Bayes theorem****bayous**

DEF A term variously applied to many local water features in the lower Mississippi River basin and in the Gulf Coast region of the U.S., especially in Louisiana. Its general meaning is a creek of a secondary watercourse that is tributary to another body of water; especially through alluvial lowlands, coastal swamps or river deltas. The origin of the term is from the American French "boyau", "gut"; from the Choctaw "bayuk", "small stream".

GS landforms  
 . inlets (topography)  
 . . **bayous**  
 RT lakes  
 marshlands  
 rivers

∞ **bays**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT bays (structural units)  
 bays (topographic features)

**bays (structural units)**

RT aircraft compartments  
 airframes  
 ∞ bays  
 compartments  
 fuselages  
 hulls (structures)  
 shells (structural forms)

**bays (topographic features)**

DEF Wide, curving open indentations, recesses, or arms of seas or lakes into the land or between two capes or headlands; larger than coves, and usually smaller than, but of the same

general character as gulfs. Used for bights and coves.

UF *bights*  
*coves*

GS **bays (topographic features)**

. Chesapeake Bay (US)  
 . Delaware Bay (US)  
 . Hudson Bay (Canada)  
 . Monterey Bay (CA)  
 . Saginaw Bay (MI)  
 . San Francisco Bay (CA)  
 . San Pablo Bay (CA)

RT ∞ bays  
 estuaries  
 gulfs  
 inlets (topography)

**BBGKY hierarchy**

GS classifications  
 . hierarchies  
 . . **BBGKY hierarchy**  
 RT Bogoliubov theory  
 Boltzmann transport equation  
 equations of state  
 Fourier transformation  
 kinetic equations  
 plasma physics

*BCAS*USE **Beacon Collision Avoidance System***BCC lattices*USE **body centered cubic lattices****BCH codes**

UF *Bose-Chaudhuri-Hocquenghem codes*  
 RT binary codes  
 ∞ codes  
 coding  
 computer programming  
 decoders  
 decoding  
 digital techniques  
 error correcting devices  
 information theory  
 parity  
 random errors

**BCS theory**

UF *Bardeen-Cooper-Schrieffer theory*  
 RT many body problem  
 superconductivity  
 ∞ theories  
 thermodynamic coupling

*BE A*USE **Beacon Explorer A***BE B*USE **Explorer 22 satellite***BE C*USE **Explorer 27 satellite****BE-3 engine**

GS engines  
 . rocket engines  
 . . retrorocket engines  
 . . . **BE-3 engine**  
 RT Athena rocket vehicle  
 Ranger lunar landing vehicles  
 solid propellant rocket engines

**beaches**

DEF Stretches of unconsolidated material that constitute gently sloping zones, typically with concave profiles, extending landward from the low-water line to the place where there is a definite change in material or physiographic form. Used for advancing shorelines, backshores, and inshore zones.

UF *advancing shorelines*  
*backshores*  
*inshore zones*

RT bars (landforms)  
 coastal currents  
 coastal plains  
 coasts  
 cusps (landforms)



# Beacon Collision Avoidance System

- dunes
- lagoons
- lakes
- littoral drift
- marine environments
- shoals
- shorelines
- topography
- waterfowl

## Beacon Collision Avoidance System

- UF *BCAS*
- GS avoidance
  - . collision avoidance
  - . . **Beacon Collision Avoidance System**
- RT air traffic control
- aircraft safety
- midair collisions
- radio beacons
- ∞ systems
- transponders

## Beacon Explorer A

- UF *BE A*
- S-66 satellite*
- GS artificial satellites
  - . passive satellites
  - . . Beacon satellites
  - . . . **Beacon Explorer A**expandable structures
  - . inflatable structures
  - . . inflatable spacecraft
  - . . . Beacon satellites
  - . . . . **Beacon Explorer A**inflatable space structures
  - . inflatable spacecraft
  - . . Beacon satellites
  - . . . **Beacon Explorer A**space erectable structures
  - . inflatable spacecraft
  - . . Beacon satellites
  - . . . **Beacon Explorer A**
- RT Delta launch vehicle

## Beacon Explorer B

- USE **Explorer 22 satellite**

## Beacon Explorer C

- USE **Explorer 27 satellite**

## Beacon satellites

- UF *polar ionosphere beacon*
- GS artificial satellites
  - . passive satellites
  - . . **Beacon satellites**
  - . . . Beacon Explorer A
  - . . . Explorer 22 satelliteexpandable structures
  - . inflatable structures
  - . . inflatable spacecraft
  - . . . **Beacon satellites**
  - . . . . Beacon Explorer A
  - . . . . Explorer 22 satelliteinflatable space structures
  - . inflatable spacecraft
  - . . **Beacon satellites**
  - . . . Beacon Explorer A
  - . . . Explorer 22 satellitespace erectable structures
  - . inflatable spacecraft
  - . . **Beacon satellites**
  - . . . Beacon Explorer A
  - . . . Explorer 22 satellite
- RT LOCATES system

## beacons

- DEF Lights, groups of lights, electronic apparatus, or other devices that guide, orient, or warn aircraft, spacecraft, etc. in flight.
- GS navigation aids
  - . **beacons**
  - . . airport beacons
  - . . . discrete address beacon system
  - . . . radar beacons
  - . . . discrete address beacon system
  - . . . radio beacons
  - . . . omnidirectional radio ranges
  - . . . . self calibrating omnirange
  - . . . radio direction finders

- RT aircraft lights
- buoys
- compasses
- homing
- homing devices
- instrument flight rules
- ∞ markers
- position indicators
- projectors
- searchlights
- ∞ signals
- solar compasses
- visual signals

## beads

- RT spot welds
- welded joints
- welding

## Beagle aircraft

- RT ∞ aircraft

## beam currents

- DEF Currents incident on specimens by primary particle sources.
- GS electric current
  - . **beam currents**
- RT backward wave tubes
- Brillouin flow
- ∞ currents
- plasma currents

## beam forming

- USE **beamforming**

## beam injection

- DEF The introduction of a particle radiation beam into a plasma or ionized gas for the purpose of diagnostics, plasma control, or the study of beam/plasma interactions.
- RT electron beams
- ion beams
- neutral beams
- plasma heating
- plasma-particle interactions
- tokamak devices
- toroidal plasmas

## beam interactions

- DEF A general term for interactions between various types of beams with each other or with plasmas or substances.
- RT atom optics
- beams (radiation)
- collision parameters
- high energy interactions
- ∞ interactions
- wave-particle interactions

## beam leads

- GS conductors
  - . electric conductors
  - . . **beam leads**
  - . . flat conductors
  - . . . **beam leads**
- RT bonding
- electric connectors
- ∞ joining
- microelectronics
- micromodules
- soldered joints

## beam neutralization

- DEF Neutralization that takes place by means of charge exchange with a neutral gas.
- RT beams (radiation)
- electron beams
- ion beams
- neutral beams

## beam plasma amplifiers

- GS amplifiers
  - . **beam plasma amplifiers**
- RT electron beams
- millimeter waves
- plasma-particle interactions
- plasmas (physics)

- relativistic electron beams

## beam rider guidance

- DEF System for guiding aircraft, spacecraft, or missiles, along a desired path by means of a radar beam, light beam, etc. The center of the beam axis forms a line along which the vehicle senses its location and corrects its course relative to the beam axis.
- GS guidance (motion)
  - . **beam rider guidance**
- RT missile control
- missile systems

## beam splitters

- DEF Partially reflecting mirrors which permit some incident light to pass through and reflect the remainder.
- RT beams (radiation)
- particle accelerators
- particle beams
- scatter plates (optics)

## beam steering

- (added June 1997)

- GS steering
  - . **beam steering**
- RT antenna radiation patterns
- beam waveguides
- beamforming
- beams (radiation)
- collimation
- laser beams
- steerable antennas

## beam switching

- GS switching
  - . **beam switching**
- RT beams (radiation)
- electron optics
- ion engines
- lasers
- magnetic switching
- packet switching

## beam waveguides

- GS waveguides
  - . **beam waveguides**
- RT beam steering
- collimators
- ion optics
- photon beams
- plasmaguides
- rectangular waveguides
- wave propagation
- yokes

## beamed power

- USE **power beaming**

## beamforming

- (added September 1992)

- UF *beam forming*
- beamshaping*
- GS collimation
  - . **beamforming**
- RT antenna arrays
- antenna radiation patterns
- beam steering
- beams (radiation)
- ion optics
- laser beams
- polarization (waves)
- radar beams

## ∞ beams

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT beams (radiation)
- beams (supports)

## beams (radiation)

- GS **beams (radiation)**
  - . gamma ray beams
  - . light beams
  - . . laser beams
  - . . microbeams
  - . . particle beams
  - . . . atomic beams
  - . . . electron beams

- . . . relativistic electron beams
- . . . ion beams
- . . . neutral beams
- . . . molecular beams
- . . . neutron beams
- . . . neutrino beams
- . . . pion beams
- . . . proton beams
- . pencil beams
- . phonon beams
- . photon beams
- . radar beams
- RT beam interactions
- beam neutralization
- beam splitters
- beam steering
- beam switching
- beamforming
- ∞ beams
- coherent electromagnetic radiation
- coherent radiation
- corpuscular radiation
- electromagnetic radiation
- extreme ultraviolet radiation
- infrared radiation
- ionizing radiation
- irradiation
- light (visible radiation)
- longitudinal waves
- monochromatic radiation
- multibeam antennas
- plane waves
- ∞ radiation
- ∞ rays
- submillimeter waves
- ultraviolet radiation
- beams (supports)**
- UF *structural beams*
- GS structural members
- . **beams (supports)**
- . . box beams
- . . cantilever beams
- . . curved beams
- . . Euler-Bernoulli beams
- . . I beams
- . . rectangular beams
- . . Timoshenko beams
- RT ∞ beams
- clamped structures
- columns (supports)
- girders
- ∞ headers
- plastic bodies
- T shape
- trusses
- beamshaping*
- USE **beamforming**
- ∞ **bearing**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT bearing (direction)
- bearings
- internal combustion engines
- bearing (direction)**
- RT alignment
- azimuth
- ∞ bearing
- ∞ direction
- direction finding
- exposure
- field of view
- instrument orientation
- ∞ orientation
- position (location)
- sound localization
- ∞ space orientation
- bearing alloys**
- GS alloys
- . **bearing alloys**
- RT aluminum alloys
- babbitt metal
- bearings
- cadmium alloys
- copper alloys
- iron alloys
- lead alloys
- metal powder
- silver alloys
- tin alloys
- zinc alloys
- bearingless rotors**
- GS airfoils
- . wings
- . . rotary wings
- . . . lifting rotors
- . . . . **bearingless rotors**
- rotating bodies
- . rotors
- . . rotary wings
- . . . lifting rotors
- . . . . **bearingless rotors**
- RT hinges
- rigid rotors
- bearings**
- GS **bearings**
- . antifriction bearings
- . . ball bearings
- . . roller bearings
- . . . needle bearings
- . . foil bearings
- . . gas bearings
- . . journal bearings
- . . liquid bearings
- . . magnetic bearings
- . . thrust bearings
- RT ∞ bearing
- bearing alloys
- boundary lubrication
- bushings
- gimbals
- idlers
- internal combustion engines
- lubrication
- packings (seals)
- pivots
- shafts (machine elements)
- supports
- suspension systems (vehicles)
- swivels
- wheels
- bears**
- GS animals
- . vertebrates
- . . mammals
- . . . **bears**
- beat*
- USE **synchronism**
- beat frequencies**
- DEF The frequencies obtained when two simple harmonic quantities of different frequencies  $f_1$  and  $f_2$  are superimposed. The beat frequency equals  $f_1 - f_2$ .
- GS frequencies
- . **beat frequencies**
- RT group velocity
- intermediate frequency amplifiers
- Moire effects
- resonant frequencies
- standing waves
- superheterodyne receivers
- Beaufort Sea (North America)**
- GS seas
- . **Beaufort Sea (North America)**
- RT Alaska
- Arctic Ocean
- Canada
- bed rest**
- GS rest
- . **bed rest**
- RT calcium metabolism
- clinical medicine
- head down tilt
- head up tilt
- orthostatic tolerance
- bedding equipment**
- RT ∞ blankets
- ∞ equipment
- bediasites**
- GS celestial bodies
- . meteorites
- . . stony meteorites
- . . . tektites
- . . . . **bediasites**
- RT australites
- bedrock**
- UF *shields (geology)*
- GS rocks
- . **bedrock**
- . . Baltic Shield (Europe)
- . . batholiths
- RT Earth resources
- geology
- regolith
- ∞ shelves
- soils
- strata
- stratification
- stratigraphy
- tunneling (excavation)
- beds**
- RT beds (process engineering)
- couches
- beds (geology)**
- UF *lake beds*
- GS geology
- . **beds (geology)**
- . . salt beds
- landforms
- . **beds (geology)**
- . . salt beds
- RT ocean bottom
- strata
- stratigraphy
- beds (process engineering)**
- RT beds
- chemical reactors
- extraction
- filtration
- fluidized bed processors
- ion exchanging
- percolation
- Beech 99 aircraft**
- DEF Light, low-wing aircraft manufactured by Beechcraft.
- GS Beechcraft aircraft
- . **Beech 99 aircraft**
- . . Beechcraft 18 aircraft
- . . C-33 aircraft
- . . C-35 aircraft
- light aircraft
- . **Beech 99 aircraft**
- . . Beechcraft 18 aircraft
- . . C-33 aircraft
- . . C-35 aircraft
- RT ∞ aircraft
- ∞ low wing aircraft
- Beech aircraft*
- USE **Beechcraft aircraft**
- Beech C-33 aircraft*
- USE **C-33 aircraft**
- Beech S-35 aircraft*
- USE **C-35 aircraft**
- Beechcraft 18 aircraft**
- GS Beechcraft aircraft
- . Beech 99 aircraft
- . . **Beechcraft 18 aircraft**
- general aviation aircraft
- . **Beechcraft 18 aircraft**
- light aircraft
- . Beech 99 aircraft
- . . **Beechcraft 18 aircraft**
- monoplanes
- . **Beechcraft 18 aircraft**

## Beechcraft aircraft

RT ∞ aircraft

### Beechcraft aircraft

UF *Beech aircraft*

GS **Beechcraft aircraft**

- . Beech 99 aircraft
- . . Beechcraft 18 aircraft
- . . C-33 aircraft
- . . C-35 aircraft

RT ∞ aircraft

### Beer law

RT absorptivity  
Bouguer law  
electromagnetic absorption  
molecular absorption

### bees

GS animals  
. invertebrates  
. . arthropods  
. . . insects  
. . . . **bees**

RT swarming

### beetles

GS animals  
. invertebrates  
. . arthropods  
. . . insects  
. . . . Coleoptera  
. . . . . **beetles**  
. . . . . tribolia

RT infestation

### behavior

DEF The way in which an organism, organ, body, or substance acts in an environment or responds to excitation, as the behavior of steel under stress, or the behavior of an animal in a test.

GS **behavior**  
. deconditioning  
. human behavior

RT conditioning (learning)  
diagnosis  
education  
extroversion  
learning  
migration  
Skinner boxes

### Belarus

(added August 1993)

GS nations

. **Belarus**

RT Europe

### Belfast aircraft

USE **SC-5 aircraft**

### Belgian Congo

USE **Democratic Republic of Congo**

### Belgian space program

(added August 1990)

GS programs  
. space programs  
. . European space programs  
. . . **Belgian space program**

RT Belgium

### Belgium

GS nations  
. **Belgium**

RT Belgian space program  
Europe

### belief networks

(added December 1994)

DEF Artificial Intelligence technique for computing probabilistic information.

UF *Bayesian belief networks*

GS networks

. **belief networks**

RT artificial intelligence  
Bayes theorem  
computer techniques  
expert systems  
knowledge representation  
neural nets

probability theory

### Belize

UF *British Honduras*

GS nations

. **Belize**

RT Caribbean region  
Caribbean Sea  
Central America

### Bell 214A helicopter

DEF Sixteen-seat utility helicopter manufactured by Bell Helicopter.

GS Bell aircraft

. **Bell 214A helicopter**

V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . **Bell 214A helicopter**

RT ∞ aircraft  
vertical takeoff aircraft

### Bell aircraft

GS **Bell aircraft**

. AH-1S helicopter  
. AH-1W helicopter  
. AH-63 helicopter  
. Bell 214A helicopter  
. OH-4 helicopter  
. OH-13 helicopter  
. UH-1 helicopter  
. V-22 aircraft  
. X-1 aircraft  
. X-2 aircraft  
. X-5 aircraft  
. X-14 aircraft  
. X-22 aircraft  
. XV-3 aircraft  
. XV-15 aircraft

RT ∞ aircraft

### Bellman theory

RT dynamic programming  
optimization  
∞ theories

### bellows

SN (EXPANDABLE JOINTS--FOR DEVICES TO MOVE GASES, USE BLOWERS)

DEF Mechanical structures with walls like those of an accordion.

GS expandable structures

. **bellows**

RT expulsion bladders  
joints (junctions)  
pumps

### bells

RT auditory signals  
pressure vessels  
psychoacoustics

∞ signals  
sound generators  
warning  
warning systems

### Beltrami flow

GS fluid flow

. **Beltrami flow**

RT incompressible flow  
steady flow  
vorticity

### ∞ belts

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT asteroid belts  
cables (ropes)  
fasteners  
girdles  
proton belts  
pulleys  
radiation belts  
regions  
Rouse belts  
seat belts  
terrestrial dust belt

### Benard cells

GS convection

. free convection  
. . Rayleigh-Benard convection

. . . **Benard cells**

fluid flow  
. convective flow  
. . Rayleigh-Benard convection  
. . . **Benard cells**

RT convection currents  
convection-diffusion equation  
Rayleigh number  
solar convection (astronomy)  
solar granulation  
stellar convection

### benches

USE **seats**

### bend tests

DEF Ductility tests in which specimens are bent through an arc of known radius and angle.

RT bending  
crack propagation  
destructive tests  
flexural strength  
fracture mechanics  
fracture strength  
∞ materials tests  
∞ tests

### bending

GS **bending**  
. elastic bending

RT bend tests  
∞ bows  
buckling  
camber  
deflection  
deformation  
displacement  
distortion  
elastic deformation  
Euler-Bernoulli beams  
fatigue tests  
fiber strength  
flexibility  
flexing  
flutter  
folding  
heaving  
kinking  
modulus of elasticity  
plastic deformation  
stiffness  
structural failure  
structural strain  
temperature inversions  
twisting  
warpage

### bending diagrams

GS diagrams  
. **bending diagrams**

RT deflection

### bending fatigue

GS fatigue (materials)  
. **bending fatigue**

RT flexural strength  
metal fatigue  
S-N diagrams

### bending moments

GS moments  
. **bending moments**

RT loading moments  
NASTRAN  
static loads  
stress analysis  
structural design criteria  
torque

### bending strength

USE **flexural strength**

### bending theory

RT stress analysis  
stress intensity factors  
∞ theories

- Treffitz method
- bending vibration**  
 GS vibration  
 . structural vibration  
 . . **bending vibration**  
 RT breathing vibration  
 Euler-Bernoulli beams  
 flutter  
 missile vibration  
 panel flutter  
 random vibration  
 self induced vibration
- bends (physiology)*  
 USE **decompression sickness**
- beneficiation**  
 RT ∞ absorption  
 adsorption  
 aeration  
 clean fuels  
 comminution  
 concentrating  
 ∞ conditioning  
 enrichment  
 exploitation  
 extraction  
 filtration  
 flotation  
 foaming  
 isotopic enrichment  
 leaching  
 ∞ metallurgy  
 minerals  
 purification  
 refining  
 ∞ separation  
 settling  
 size separation  
 sublimation  
 upgrading  
 washing  
 wastes
- Benin**  
 UF *Dahomey*  
 GS nations  
 . **Benin**  
 RT Africa
- bentonite**  
 DEF A soft, plastic, porous, light colored rock composed essentially of clay minerals of the montmorillonite group plus colloidal silica, and produced by divitrification and chemical alteration of a glassy igneous material, usually a tuff or a volcanic ash.  
 RT montmorillonite  
 soils  
 water treatment
- benzene**  
 GS organic compounds  
 . cyclic compounds  
 . . cyclic hydrocarbons  
 . . . **benzene**  
 . hydrocarbons  
 . . cyclic hydrocarbons  
 . . . **benzene**  
 RT chlorobenzenes  
 cyclohexane  
 solvent refined coal  
 thiophenes
- benzene poisoning**  
 GS diseases  
 . toxic diseases  
 . . **benzene poisoning**  
 toxicity  
 . **benzene poisoning**  
 RT hydrocarbon poisoning  
 industrial safety  
 ∞ poisoning  
 toxicity and safety hazard  
 toxicology
- benzilic acid**  
 GS acids  
 . carboxylic acids
- . . fatty acids  
 . . . **benzilic acid**  
 organic compounds  
 . carboxylic acids  
 . . fatty acids  
 . . . **benzilic acid**
- benzoic acid**  
 GS acids  
 . carboxylic acids  
 . . fatty acids  
 . . . **benzoic acid**  
 organic compounds  
 . carboxylic acids  
 . . fatty acids  
 . . . **benzoic acid**
- benzoquinone*  
 USE **quinones**
- Berenice rocket vehicle**  
 GS rocket vehicles  
 . multistage rocket vehicles  
 . . **Berenice rocket vehicle**  
 RT hypersonic reentry  
 solid propellant rocket engines
- Bergman operator**  
 GS operators (mathematics)  
 . **Bergman operator**
- Bering Sea**  
 GS seas  
 . **Bering Sea**  
 RT Pacific Ocean
- berkelium**  
 GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . **berkelium**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements  
 . . . . . **berkelium**  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . **berkelium**
- Bermuda**  
 GS landforms  
 . islands  
 . . **Bermuda**  
 RT Atlantic Ocean
- Bernoulli equation*  
 USE **Bernoulli theorem**
- Bernoulli theorem**  
 DEF In aeronautics, a law or theorem stating that in a flow of incompressible fluid the sum of the static pressure and the dynamic pressure along a streamline is constant if gravity and frictional effects are disregarded. It is named for Daniel Bernoulli, a Swiss scientist who lived from 1700 to 1782. Used for Bernoulli equation.  
 UF *Bernoulli equation*  
 GS theorems  
 . **Bernoulli theorem**  
 RT conservation equations  
 ∞ equations  
 flow equations  
 fluid flow  
 isentropic processes  
 linearization  
 Magnus effect  
 panel method (fluid dynamics)
- Bernstein energy principle**  
 GS structural analysis  
 . energy methods  
 . . **Bernstein energy principle**  
 RT ∞ energy  
 magnetic fields
- beryl**  
 UF *emerald*  
 GS aluminum compounds  
 . **beryl**
- . . alexandrite  
 beryllium compounds  
 . **beryl**  
 . . alexandrite  
 minerals  
 . **beryl**  
 . . alexandrite  
 silicon compounds  
 . silicates  
 . . **beryl**  
 . . . alexandrite  
 RT beryllium
- beryllium**  
 GS chemical elements  
 . **beryllium**  
 . . beryllium isotopes  
 . . . beryllium 7  
 . . . beryllium 9  
 . . . beryllium 10  
 metals  
 . **beryllium**  
 . . beryllium isotopes  
 . . . beryllium 7  
 . . . beryllium 9  
 . . . beryllium 10  
 RT beryl  
 moderators
- beryllium 7**  
 GS chemical elements  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 7**  
 . nuclides  
 . . isotopes  
 . . . beryllium isotopes  
 . . . . **beryllium 7**  
 . . . . radioactive isotopes  
 . . . . . **beryllium 7**  
 metals  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 7**
- beryllium 9**  
 GS chemical elements  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 9**  
 . nuclides  
 . . isotopes  
 . . . beryllium isotopes  
 . . . . **beryllium 9**  
 . . . . radioactive isotopes  
 . . . . . **beryllium 9**  
 metals  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 9**
- beryllium 10**  
 GS chemical elements  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 10**  
 . nuclides  
 . . isotopes  
 . . . beryllium isotopes  
 . . . . **beryllium 10**  
 . . . . radioactive isotopes  
 . . . . . **beryllium 10**  
 metals  
 . beryllium  
 . . beryllium isotopes  
 . . . **beryllium 10**
- beryllium alloys**  
 GS alloys  
 . light alloys  
 . . **beryllium alloys**
- beryllium borohydrides**  
 GS beryllium compounds  
 . **beryllium borohydrides**  
 boron compounds  
 . borohydrides  
 . . **beryllium borohydrides**  
 . boron hydrides  
 . . **beryllium borohydrides**

## beryllium chlorides

- hydrogen compounds
- . hydrides
- . . borohydrides
- . . . **beryllium borohydrides**
- . . boron hydrides
- . . . **beryllium borohydrides**

### beryllium chlorides

GS beryllium compounds

- . **beryllium chlorides**

halogen compounds

- . chlorine compounds
- . . chlorides
- . . . **beryllium chlorides**
- . halides
- . . chlorides
- . . . **beryllium chlorides**
- . . metal halides
- . . . **beryllium chlorides**

### beryllium compounds

GS **beryllium compounds**

- . beryl
- . . alexandrite
- . beryllium borohydrides
- . beryllium chlorides
- . beryllium fluorides
- . beryllium hydrides
- . beryllium nitrides
- . beryllium oxides
- . . alexandrite

RT ∞ alkaline earth compounds

∞ chemical compounds

∞ metal compounds

- metal fuels
- metal propellants

### beryllium fluorides

GS beryllium compounds

- . **beryllium fluorides**

halogen compounds

- . fluorine compounds
- . . fluorides
- . . . metal fluorides
- . . . . **beryllium fluorides**
- . halides
- . . fluorides
- . . . metal fluorides
- . . . . **beryllium fluorides**
- . . metal halides
- . . . metal fluorides
- . . . . **beryllium fluorides**

### beryllium hydrides

GS beryllium compounds

- . **beryllium hydrides**

hydrogen compounds

- . hydrides
- . . metal hydrides
- . . . **beryllium hydrides**

### beryllium isotopes

GS chemical elements

- . beryllium
- . . **beryllium isotopes**
- . . . beryllium 7
- . . . beryllium 9
- . . . beryllium 10
- . nuclides
- . . isotopes
- . . . **beryllium isotopes**
- . . . . beryllium 7
- . . . . beryllium 9
- . . . . beryllium 10
- metals
- . beryllium
- . . **beryllium isotopes**
- . . . beryllium 7
- . . . beryllium 9
- . . . beryllium 10

### beryllium nitrides

GS beryllium compounds

- . **beryllium nitrides**

nitrogen compounds

- . nitrides
- . . metal nitrides

- . . . **beryllium nitrides**

### beryllium oxides

GS beryllium compounds

- . **beryllium oxides**
- . . alexandrite
- . . chalcogenides
- . . oxides
- . . . metal oxides
- . . . . alkaline earth oxides
- . . . . **beryllium oxides**
- . . . . . alexandrite

### beryllium poisoning

GS diseases

- . toxic diseases
- . . **beryllium poisoning**
- . toxicity
- . . **beryllium poisoning**

RT industrial safety

∞ poisoning

- respiratory diseases
- toxicity and safety hazard
- toxicology

### BESS (satellite)

DEF A proposed NASA primate biomedical experiment scientific satellite that was never developed. Used for biomedical experiment scientific satellite.

UF *Biomedical Experiment Scientific Satellite*

GS artificial satellites

- . **BESS (satellite)**

RT multimission modular spacecraft

- space shuttles

### Bessel functions

GS analysis (mathematics)

- . complex variables
- . . **Bessel functions**
- . . . Hankel functions
- . . real variables
- . . . **Bessel functions**
- . . . . Hankel functions

RT boundary value problems

- differential equations
- hypergeometric functions
- orthogonal functions
- power series

### Bessel-Bredichin theory

RT comets

- Kohoutek comet
- radiation pressure

∞ theories

### beta factor

DEF In plasma physics, the ratio of the plasma kinetic pressure to the magnetic pressure.

RT dense plasmas

- fluid pressure
- fusion reactors
- magnetic fields
- magnetic flux
- magnetohydrodynamic stability
- plasma control
- plasma equilibrium
- plasma heating
- plasma physics
- pressure effects
- reactor physics
- tokamak devices
- toroidal plasmas

### beta interactions

USE **weak interactions (field theory)**

### beta particles

DEF Particles emitted in the radioactive decay of many radionuclides. A beta particle is identical to an electron. It has a short range in air and a low ability to penetrate other materials.

GS ionizing radiation

- . **beta particles**

nuclear radiation

- . **beta particles**

particles

- . charged particles

- . . energetic particles
- . . . plasmas (physics)
- . . . . **beta particles**

corpuscular radiation

- . electron radiation
- . . **beta particles**

energetic particles

- . . plasmas (physics)
- . . . . **beta particles**

elementary particles

- . **beta particles**

nuclear particles

- . **beta particles**

RT decay

- electron beams
- electrons
- flux (rate)
- hot atoms
- N electrons
- relativistic electron beams
- weak energy interactions

### betaines

GS bases (chemical)

- . alkaloids
- . . **betaines**

nitrogen compounds

- . alkaloids
- . . **betaines**

organic compounds

- . cyclic compounds
- . . heterocyclic compounds
- . . . alkaloids
- . . . . **betaines**

### betatrons

DEF Particle accelerators in which magnetic induction is used to accelerate electrons.

GS particle accelerators

- . cyclic accelerators
- . . **betatrons**
- . . electron accelerators
- . . **betatrons**

RT microtrons

- synchrotrons

### Bethe-Heitler formula

GS mathematical logic

- . formulas (mathematics)
- . . **Bethe-Heitler formula**

### Bethe-Salpeter equation

GS analysis (mathematics)

- . real variables
- . . **Bethe-Salpeter equation**

RT differential equations

∞ equations

- equations of motion
- kinetic equations
- quantum mechanics

### bevatron

GS particle accelerators

- . cyclic accelerators
- . . synchrotrons
- . . . **bevatron**

RT synchrocyclotrons

### bevel gears

(added May 1999)

GS gears

- . **bevel gears**
- . . spiral bevel gears

RT gear teeth

### beverages

GS liquids

- . potable liquids
- . . **beverages**
- . . . wines

RT coffee

- drinking

∞ food

- milk

### BGK model

(added September 1993)

UF *Bhatnagar-Grass-Krook model*

GS models

- . mathematical models

- . . **BGK model**  
 RT Boltzmann transport equation  
 computational fluid dynamics  
 kinetic equations  
 kinetic theory  
 Knudsen flow  
 molecular collisions  
 molecular flow  
 particle collisions  
 rarefied gas dynamics
- Bhatnagar-Grass-Krook model*  
 USE **BGK model**
- Bhutan**  
 GS nations  
 . **Bhutan**  
 RT Himalayas  
 India  
 Sikkim  
 Tibet
- bias**  
 DEF A constant or systematic error as opposed to a random error. It manifests itself as a persistent positive or negative deviation of the method average from the accepted reference value.  
 GS **bias**  
 . response bias  
 RT compensators  
 displacement  
 electric potential errors  
 instrument errors  
 open circuit voltage  
 tube grids
- bibliographies**  
 GS documents  
 . **bibliographies**  
 RT abstracts  
 biography  
 documentation  
 general overviews  
 handbooks  
 indexes (documentation)  
 information dissemination  
 information retrieval  
 libraries  
 literature  
 ∞ reference systems  
 space glossaries  
 summaries
- bicarbonates*  
 USE **carbonates**
- bicrystals**  
 GS crystals  
 . **bicrystals**  
 RT polycrystals  
 single crystals
- ∞ **bicycle**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT landing gear  
 surface vehicles
- bidirectional reflectance**  
 GS electromagnetic properties  
 . optical properties  
 . . reflectance  
 . . . **bidirectional reflectance**  
 RT light scattering  
 reflection  
 spectral reflectance  
 surface properties
- bifurcation (biology)**  
 DEF The separation or branching into two parts, areas, aspects or connected segments, of anatomical systems or functions.  
 RT anatomy  
 arteries  
 arterioles  
 ∞ biology  
 blood vessels  
 branching (physics)
- veins
- bifurcation (mathematics)*  
 USE **branching (mathematics)**
- big bang cosmology**  
 GS cosmology  
 . **big bang cosmology**  
 RT astronomical models  
 background radiation  
 cosmic rays  
 galactic evolution  
 gamma ray bursts  
 grand unified theory  
 gravitational constant  
 large-scale structure of the universe  
 relativity  
 relic radiation  
 universe
- Bighorn Mountains (MT-WY)**  
 GS landforms  
 . mountains  
 . . **Bighorn Mountains (MT-WY)**  
 RT Montana  
 Wyoming
- bights*  
 USE **bays (topographic features)**
- biharmonic equations**  
 GS analysis (mathematics)  
 . real variables  
 . . differential equations  
 . . . partial differential equations  
 . . . . **biharmonic equations**  
 RT elastic properties  
 ∞ equations
- billets**  
 RT casting  
 castings  
 forging  
 ingots  
 metal plates  
 metal strips  
 rods  
 slabs  
 wire
- bimetals**  
 RT alloying  
 alloys  
 composite materials  
 functionally gradient materials  
 metal bonding  
 metals
- bimetric theories**  
 DEF Theories of gravitation.  
 RT gravitation theory  
 metric space  
 Schwarzschild metric  
 ∞ theories
- binary alloys**  
 GS alloys  
 . **binary alloys**  
 binary systems (materials)  
 . **binary alloys**  
 RT alloying  
 antiphase boundaries  
 cluster variation method
- binary codes**  
 DEF Codes composed of a combination of entities each of which can assume one of two possible states. Each entity must be identifiable in time or space.  
 RT BCH codes  
 bit error rate  
 ∞ codes  
 concatenated codes  
 digital systems  
 trellis coding
- binary data**  
 RT analog data  
 bit error rate  
 bubble memory devices  
 ∞ data
- data processing  
 decimal to binary converters  
 digital data
- binary digits**  
 GS symbols  
 . alphanumeric characters  
 . . digits  
 . . . **binary digits**  
 RT bit error rate  
 bits  
 digital electronics  
 digital systems
- binary fluids**  
 GS binary systems (materials)  
 . binary mixtures  
 . . **binary fluids**  
 mixtures  
 . binary mixtures  
 . . **binary fluids**  
 RT ∞ fluids  
 gas mixtures  
 kinetic theory  
 Lennard-Jones gas  
 transport properties
- binary integration**  
 GS analysis (mathematics)  
 . real variables  
 . . measure and integration  
 . . . **binary integration**  
 RT adding circuits  
 digital integrators
- binary mixtures**  
 GS binary systems (materials)  
 . **binary mixtures**  
 . . binary fluids  
 . . . eutectics  
 . . . eutectic alloys  
 mixtures  
 . **binary mixtures**  
 . . binary fluids  
 . . . eutectics  
 . . . eutectic alloys  
 RT azeotropes  
 gas mixtures  
 liquid-gas mixtures
- binary phase shift keying**  
*(added February 1992)*  
 UF *biphase shift keying*  
*BPSK*  
 GS coding  
 . signal encoding  
 . . phase modulation  
 . . . phase shift keying  
 . . . . **binary phase shift keying**  
 keying  
 . phase shift keying  
 . . **binary phase shift keying**  
 modulation  
 . phase modulation  
 . . phase shift keying  
 . . . **binary phase shift keying**  
 RT quadrature phase shift keying  
 satellite transmission
- binary stars**  
 DEF Systems of two stars revolving about a barycenter.  
 GS celestial bodies  
 . stars  
 . . double stars  
 . . . **binary stars**  
 . . . . cataclysmic variables  
 . . . . companion stars  
 . . . . . Nemesis (star)  
 . . . . eclipsing binary stars  
 . . . . . dwarf novae  
 . . . . . Lambda Tauri stars  
 . . . . . Zeta Aurigae star  
 . . . . Sigma Orionis  
 . . . . symbiotic stars  
 . . . . x ray binaries  
 RT accretion disks  
 gravitational binding energy  
 limb darkening  
 star clusters

## binary systems (materials)

stellar parallax  
stellar systems  
superhumps (astronomy)  
triple stars  
two body problem  
variable stars

### binary summators

USE **adding circuits**

### binary systems (digital)

USE **digital systems**

### binary systems (materials)

UF *two phase systems*  
GS **binary systems (materials)**

. binary alloys  
. binary mixtures  
. . . binary fluids  
. . . eutectics  
. . . eutectic alloys

RT alloys  
∞ materials  
phase diagrams  
phase separation (materials)  
solidus  
∞ systems  
ternary systems

### binary to decimal converters

GS data converters  
. **binary to decimal converters**  
RT computer components  
∞ converters  
data processing  
decimal to binary converters

### binaural hearing

GS hearing  
. **binaural hearing**  
perception  
. **binaural hearing**  
RT auditory perception  
sound localization  
Weber test

### binders (adhesives)

USE **adhesives**

### binders (materials)

GS **binders (materials)**  
. propellant binders  
. . . solid rocket binders  
RT additives  
adhesives  
cements  
∞ materials  
molding materials  
oxetane polymers  
sizing materials  
solid lubricants

### binding

RT binding energy  
bonding  
collating  
folding  
∞ joining  
printing  
sealing  
sewing

### binding energy

(added May 1995)

GS **binding energy**  
. gravitational binding energy  
. nuclear binding energy  
RT activation energy  
active sites (chemistry)  
binding  
chemical bonds  
electrostatic bonding  
∞ energy  
lattice energy  
quantum wells

vacancies (crystal defects)

### binding sites

(added August 2004)  
USE **active sites (chemistry)**

### binocular vision

GS vision  
. **binocular vision**  
RT haploscopes  
motion perception  
space perception  
stereoscopic vision

### binoculars

GS optical equipment  
. **binoculars**  
RT eyepieces  
microscopes  
periscopes  
telescopes

### binomial coefficients

GS analysis (mathematics)  
. combinatorial analysis  
. . **binomial coefficients**  
coefficients  
. **binomial coefficients**  
RT factorials

### binomial theorem

GS algebra  
. **binomial theorem**  
theorems  
. **binomial theorem**  
RT binomials  
probability density functions  
probability theory  
statistical analysis  
statistical distributions

### binomials

GS algebra  
. polynomials  
. . **binomials**  
RT binomial theorem

### bioacoustics

GS acoustics  
. **bioacoustics**  
RT acoustic attenuation  
auditory defects  
auditory sensation areas  
bioengineering  
∞ biology  
psychoacoustics  
∞ science  
sound intensity

### bioassay

DEF A standardized procedure for the determination of the effects of an environmental variable or substance on living organisms. Used for biological analysis.

UF *biological analysis*  
RT animal models  
biochemistry  
biological diversity  
biological effects  
∞ biology  
biomarkers  
histochemical analysis  
in vitro methods and tests  
in vivo methods and tests  
lab-on-a-chip devices

### Bioastronautical Orbital Space System

GS programs  
. NASA programs  
. . NASA space programs  
. . . **Bioastronautical Orbital Space System**  
. space programs  
. . NASA space programs  
. . . **Bioastronautical Orbital Space System**  
RT ∞ systems

### bioastronautics

DEF The study of biological, behavioral,

and medical problems pertaining to astronautics. This includes systems functioning in the environments expected to be found in space, vehicles designed to travel in space, and the conditions on terrestrial bodies other than the Earth.

RT aerospace environments  
aerospace medicine  
animal models  
∞ astronautics  
bioengineering  
∞ biology  
Biosatellite 1  
Biosatellite 2  
Biosatellite 3  
closed ecological systems  
Columbus space station  
Earth atmosphere  
exobiology  
head down tilt  
head up tilt  
hindlimb suspension  
lunar environment  
planetary environments  
∞ science  
space adaptation syndrome  
space exploration  
space flight  
space stations  
spacecraft environments  
tilt-table test

### bioavailability

(added August 2001)

DEF The extent to which a drug, nutrient, toxin, or other substance enters the circulatory system or becomes available at a site of physiological activity.

UF *biological availability*  
*physiologic availability*

GS availability  
. **bioavailability**  
RT adsorption  
exposure  
intravenous procedures  
material absorption  
pharmacology  
physiochemistry  
sorption  
toxicity  
toxicology

### biochemical fuel cells

GS electric generators  
. direct power generators  
. . fuel cells  
. . . **biochemical fuel cells**  
electrochemical cells  
. fuel cells  
. . **biochemical fuel cells**  
RT ∞ biology  
phosphoric acid fuel cells  
regenerative fuel cells

### biochemical oxygen demand

DEF The amount of oxygen necessary for the oxidative decomposition of a material by microorganisms. The amount of oxygen consumed in mg/l of water (or waste water) over a period of 5 days at 20 deg. C under laboratory conditions. Used for BOD.

UF *BOD*  
RT algae  
∞ biology  
ecology  
oximetry  
oxygen consumption  
plants (botany)  
pollution control  
water pollution  
water treatment

### biochemistry

DEF Chemistry dealing with the chemical processes and compounds of living organisms.

GS **biochemistry**  
. biogeochemistry  
. enzymology  
. physiochemistry  
RT bacteriology

bioassay  
 biodegradation  
 bioengineering  
 ∞ biology  
 biomarkers  
 biomimetics  
 chemical warfare  
 ∞ chemistry  
 cytology  
 enzyme inhibitors  
 Gaia hypothesis  
 genetic engineering  
 histochemical analysis  
 immunoassay  
 indoleacetic acids  
 interferon  
 marine chemistry  
 metabolites  
 molecular biology  
 mutagens  
 nitrogen metabolism  
 nutrition  
 optical activity  
 organic chemistry  
 polymerase chain reaction  
 radioimmunoassay  
 vegetation growth

*bioclimatology*  
 USE **biometeorology**

**biocompatibility**  
 DEF Compatibility of substances with living tissues and blood components.  
 GS compatibility  
 . **biocompatibility**  
 RT antibodies  
 antigens  
 ∞ biology  
 blood  
 immunology  
 leukocytes  
 monocytes  
 physiological defenses  
 vaccines

**biocontrol systems**  
 SN (RESTRICTED TO ARTIFICIAL BIOTECHNOLOGICAL SYSTEMS FOR THE CONTROL OF BIOLOGICAL PROCESSES--USE REGULATORY MECHANISMS (BIOLOGY) FOR NATURAL PHYSIOLOGICAL REGULATION)  
 RT biofeedback  
 ∞ biology  
 bionics  
 psychomotor performance  
 regulatory mechanisms (biology)  
 ∞ systems  
 tolerances (physiology)

**bioconversion**  
 DEF The transformation of algae and/or other biomass materials in successive stages to aliphatic organic acids to aliphatic hydrocarbons to diesel and/or other liquid fuels.  
 RT algae  
 ∞ biology  
 biomass energy production  
 bioprocessing  
 ∞ conversion  
 enzyme activity  
 fermentation  
 fuels  
 hydrocarbon fuel production  
 methane  
 renewable energy  
 solar heating  
 vegetation

**biodegradability**  
 DEF The characteristic of a substance that can be decomposed by microorganisms.  
 GS dissociation  
 . **biodegradability**  
 RT ∞ biology  
 decay  
 decomposition  
 deterioration  
 organic materials

∞ properties

**biodegradation**  
 GS degradation  
 . **biodegradation**  
 RT activated sludge  
 biochemistry  
 biofilms  
 ∞ biology  
 decay  
 decomposition  
 deterioration

*biodiversity*  
 USE **biological diversity**

**biodynamics**  
 DEF The study of the effects of dynamic processes (motion, acceleration, weightlessness, etc.) on living organisms. Used for biomechanics.  
 UF *biomechanics*  
 RT anatomy  
 bioengineering  
 biological models (mathematics)  
 ∞ biology  
 biophysics  
 ∞ dynamics  
 ∞ science  
 stress (physiology)

**bioelectric potential**  
 GS potential energy  
 . electric potential  
 . . **bioelectric potential**  
 RT bioelectricity  
 ∞ biology  
 ion channels (biology)

**bioelectricity**  
 UF *neuron transmission*  
 RT bioelectric potential  
 ∞ biology  
 biomagnetism  
 information processing (biology)  
 ion channels (biology)  
 myelin sheath  
 neuromuscular transmission  
 spike potentials

**bioengineering**  
 GS **bioengineering**  
 . bioinstrumentation  
 . . biotelemetry  
 . . implanted electrodes (biology)  
 . . biometrics  
 . . body measurement (biology)  
 . . . anthropometry  
 . . . electroplethysmography  
 . . . cardiography  
 . . . ballistocardiography  
 . . . electrocardiography  
 . . . magnetocardiography  
 . . . phonocardiography  
 . . . . echocardiography  
 . . . . seismocardiography  
 . . . . vectorcardiography  
 . . . echoencephalography  
 . . . electroencephalography  
 . . . electromyography  
 . . . electronystagmography  
 . . . electroretinography  
 . . . plethysmography  
 . . . . electroplethysmography  
 . . . radiocardiography  
 . . . tissue engineering  
 RT bioacoustics  
 bioastronautics  
 biochemistry  
 biodynamics  
 ∞ biology  
 biomimetics  
 bionics  
 biopaks  
 biophysics  
 bone mineral content  
 ∞ engineering  
 genetic engineering  
 human factors engineering  
 underwater breathing apparatus

voice control

**biofeedback**  
 DEF Originally confined to the presenting of a subject with sensory information about ongoing physiological activities, it now includes the controlling of specific physiological activities through trained mental effort.  
 GS feedback  
 . **biofeedback**  
 . . sensory feedback  
 RT aerospace medicine  
 biocontrol systems  
 blood pressure  
 conditioning (learning)  
 ∞ control  
 feedback control  
 heart rate  
 human factors engineering  
 psychology

**biofilms**  
 (added July 2001)  
 DEF Films of bacteria or other microbial organisms, the growth of which is usually defined by the surface of a biological or non-biological substrate.  
 RT bacteria  
 biodegradation  
 biogeochemistry  
 contaminants  
 extraterrestrial life  
 ∞ films  
 fouling  
 membranes  
 microorganisms

**bioflavonoids**  
 UF *vitamin P*  
 GS organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . **bioflavonoids**  
 vitamins  
 . **bioflavonoids**  
 RT drugs

*biogenesis*  
 USE **biological evolution**

**biogeny**  
 RT ∞ biology  
 biomarkers  
 ∞ evolution  
 ontogeny

**biogeochemistry**  
 GS biochemistry  
 . **biogeochemistry**  
 environmental chemistry  
 . geochemistry  
 . . **biogeochemistry**  
 RT biofilms  
 ∞ biology  
 biomarkers  
 botany  
 ∞ chemistry  
 geobotany  
 International Geosphere-Biosphere program  
 minerals  
 plants (botany)

**biography**  
 GS literature  
 . **biography**  
 RT awards  
 bibliographies  
 case histories  
 documentation

*biohazards*  
 (added August 2003)  
 USE **biological hazards**

**bioinstrumentation**  
 UF *biosensors*  
 GS bioengineering  
 . **bioinstrumentation**  
 . . biotelemetry



## biological diversity

. . . implanted electrodes (biology)  
RT ∞ biology  
biometrics  
bionics  
echoencephalography  
∞ engineering  
IMBLMS  
∞ instruments  
magnetocardiography  
measuring instruments  
respirometers  
∞ sensors  
sphygmography  
wildlife radiolocation

*biological activity*  
USE **activity (biology)**

*biological analysis*  
USE **bioassay**

*biological availability*  
(added August 2001)  
USE **bioavailability**

*biological cells*  
USE **cells (biology)**

*biological clocks*  
USE **rhythm (biology)**

**biological diversity**  
(added June 1995)  
DEF The diversity of genes, species, and ecosystems that make up the variety and variability of life.  
UF *biodiversity*  
*genetic diversity*  
RT bioassay  
biological evolution  
biosynthesis  
cytology  
deforestation  
differentiation (biology)  
gene expression  
genetics  
mutations  
protobiology  
species diffusion

**biological effects**  
GS **biological effects**  
. desynchronization (biology)  
. fluid shifts (biology)  
. jet lag  
. relative biological effectiveness (RBE)  
RT activity (biology)  
apoptosis  
atrophy  
bioassay  
∞ biology  
biomedical data  
bone demineralization  
Bragg curve  
chemical effects  
disorientation  
dosage  
∞ effects  
flight stress (biology)  
human reactions  
Orbiting Frog Otolith  
pathological effects  
physiological effects  
psychological effects  
radiation dosage  
radiation effects  
space adaptation syndrome  
temperature  
thermal pollution

**biological evolution**  
UF *biogenesis*  
GS evolution (development)  
. **biological evolution**  
. . abiogenesis  
RT archaeobacteria  
biological diversity  
∞ biology  
chemical evolution

eukaryotes  
Gaia hypothesis  
gene expression  
genetics  
life sciences  
mutagens  
mutations  
panspermia  
prokaryotes  
protein synthesis  
protobiology

**biological hazards**  
(added August 2003)  
DEF Infectious agents or biologically derived infectious materials that cause health risks to human or animals through absorption, inhalation or ingestion.  
UF *biohazards*  
GS hazards  
. **biological hazards**  
RT contamination  
hazardous materials  
hazardous wastes  
toxic hazards

*biological markers*  
(added August 2004)  
USE **biomarkers**

*biological models*  
USE **bionics**

**biological models (mathematics)**  
DEF Mathematical models for living systems.  
GS models  
. mathematical models  
. . **biological models (mathematics)**  
RT biodynamics  
∞ biology  
biomimetics  
bionics  
digital simulation  
dynamic models

*biological rhythm*  
USE **rhythm (biology)**

*biological warfare agents*  
(added January 2002)  
USE **biological weapons**

**biological weapons**  
(added December 2001)  
DEF Infectious agents engineered for deliberate use as a weapon; includes bacteria, viruses, fungi, and other living microorganisms that can kill or incapacitate.  
UF *biological warfare agents*  
GS weapons  
. **biological weapons**  
RT bacteria  
chemical warfare  
infectious diseases  
spores  
terrorism  
toxins and antitoxins  
virulence  
viruses

∞ **biology**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT activation (biology)  
activity (biology)  
activity cycles (biology)  
aerobiology  
aerospace medicine  
aging (biology)  
agriculture  
anatomy  
animals  
bacteriology  
bifurcation (biology)  
bioacoustics  
bioassay  
bioastronautics  
biochemical fuel cells  
biochemical oxygen demand

biochemistry  
biocompatibility  
biocontrol systems  
bioconversion  
biodegradability  
biodegradation  
biodynamics  
bioelectric potential  
bioelectricity  
bioengineering  
biogeny  
biogeochemistry  
bioinstrumentation  
biological effects  
biological evolution  
biological models (mathematics)  
bioluminescence  
biomagnetism  
biomass  
biomass energy production  
biomedical data  
biometeorology  
biometrics  
biomimetics  
bionics  
biophysics  
bioreactors  
biosatellites  
biosphere  
biosynthesis  
biotechnology  
biotelemetry  
body composition (biology)  
body measurement (biology)  
body size (biology)  
body volume (biology)  
bone demineralization  
bone mineral content  
botany  
carbon cycle  
cells (biology)  
complement (biology)  
cytogenesis  
cytology  
differentiation (biology)  
ecology  
embryology  
evolution (development)  
exobiology  
fatigue (biology)  
flight stress (biology)  
genetic engineering  
genetics  
habitats  
immunology  
implanted electrodes (biology)  
interferon  
life sciences  
marine biology  
medical science  
microbiology  
molecular biology  
morphology  
nitrogen metabolism  
paleobiology  
protobiology  
radiobiology  
relative biological effectiveness (RBE)  
reproduction (biology)  
rhythm (biology)  
∞ science  
skin temperature (biology)  
tissues (biology)  
veterinary medicine

**bioluminescence**  
GS emission  
. light emission  
. . luminescence  
. . . **bioluminescence**  
RT ∞ biology  
luminescent proteins  
phosphorescence

**biomagnetism**  
DEF Magnetic fields surrounding parts or the whole of a living biological system; also, the effects of magnetism on parts or the whole of a biological entity.

GS magnetic fields  
 . **biomagnetism**  
 magnetic properties  
 . **biomagnetism**  
 RT bioelectricity  
 ∞ biology  
 biophysics  
 electromagnetic fields  
 electromagnetic interactions  
 radiobiology

**biomarkers***(added March 2002)*

DEF Any measurable feature from which one can infer a particular environment-induced change in a biological system, detect the presence of a disease, or infer the presence of life in a particular environment.

UF *biological markers*  
*clinical markers*

RT bioassay  
 biochemistry  
 biogeny  
 biogeochemistry  
 biometrics  
 chemical indicators  
 diagnosis  
 environmental monitoring  
 exobiology  
 extraterrestrial life  
 life detectors  
 ∞ markers  
 signatures  
 toxicology

**biomass**

DEF The dry weight of living matter in a given area expressed in terms of mass or weight per unit of volume or area.

GS weight (mass)  
 . **biomass**

RT animals  
 ∞ biology  
 carbon cycle  
 ∞ density  
 organisms  
 plants (botany)  
 populations  
 silviculture  
 ∞ weight

**biomass burning***(added December 1999)*

DEF Burning of vegetation in forests, grasslands, and agricultural lands usually carried out to clear the land and change its use; a significant contributor to the global budgets of many radiatively and chemically active gases and particulates in the atmosphere.

GS combustion  
 . **biomass burning**

RT air pollution  
 climate change  
 combustion products  
 contaminants  
 deforestation  
 environment pollution  
 forest fires  
 man environment interactions  
 smoke

**biomass energy production**

GS energy conversion  
 . **biomass energy production**

RT bioconversion  
 ∞ biology  
 bioreactors  
 ∞ crops  
 ∞ energy sources  
 energy technology  
 hydrocarbon fuel production  
 manures  
 methanation  
 renewable energy  
 vegetation

waste utilization

*biomechanics*USE **biodynamics****biomedical data**

RT aerospace medicine  
 biological effects  
 ∞ biology  
 biometrics  
 body measurement (biology)  
 cardiograms  
 ∞ data  
 heart rate  
 IMLMS

*Biomedical Experiment Scientific Satellite*USE **BESS (satellite)****biometeorology**

UF *bioclimatology*  
 GS meteorology  
 . **biometeorology**  
 RT ∞ biology  
 coastal ecology  
 coastal plains  
 ecology  
 microclimatology  
 nightglow  
 phenology

**biometrics**

GS bioengineering  
 . **biometrics**  
 . . body measurement (biology)  
 . . . anthropometry  
 . . . electroplethysmography  
 . . . cardiography  
 . . . ballistocardiography  
 . . . electrocardiography  
 . . . magnetocardiography  
 . . . phonocardiography  
 . . . echocardiography  
 . . . seismocardiography  
 . . . vectorcardiography  
 . . . echoencephalography  
 . . . electroencephalography  
 . . . electromyography  
 . . . electronystagmography  
 . . . electroretinography  
 . . . plethysmography  
 . . . electroplethysmography  
 . . . radiocardiography  
 RT bioinstrumentation  
 ∞ biology  
 biomarkers  
 biomedical data  
 bone mineral content  
 ∞ engineering  
 Orbiting Frog Otolith  
 pupillometry  
 statistical analysis  
 ∞ statistics

**biomimetics***(added October 2000)*

DEF The study of biological systems as models for the development of synthetic materials, devices, sensors, and processes.

RT biochemistry  
 bioengineering  
 biological models (mathematics)  
 ∞ biology  
 bionics  
 cybernetics  
 smart materials  
 smart structures

**bionics**

DEF The study of systems, particularly electronic systems, which function after the manner characteristic of, or resembling living systems. Used for biological models and biosimulation.

UF *biological models*  
*biosimulation*  
 RT artificial intelligence  
 automata theory  
 biocontrol systems  
 bioengineering  
 bioinstrumentation

biological models (mathematics)  
 ∞ biology  
 biomimetics  
 control systems design  
 cybernetics  
 human factors engineering  
 man machine systems  
 neuristors  
 rheoelectrical simulation  
 robots  
 simulation  
 syncoders  
 systems engineering

**biopaks**

GS support systems  
 . life support systems  
 . . **biopaks**  
 RT bioengineering  
 biosatellites  
 ∞ containers  
 enclosures  
 portable life support systems  
 preserving

**biophysics**

GS **biophysics**  
 . health physics  
 . . public health  
 RT biodynamics  
 bioengineering  
 ∞ biology  
 biomagnetism  
 ∞ physics  
 ∞ science

**biopolymer denaturation**

UF *denaturation (biopolymers)*  
*nucleic acid denaturation*  
*protein denaturation*  
 RT biopolymers  
 molecular structure  
 nucleic acids  
 polymer chemistry  
 proteins

**biopolymers**

GS **biopolymers**  
 . nucleic acids  
 . . deoxyribonucleic acid  
 . . . complementary DNA  
 . . . ribonucleic acids  
 . . proteins  
 . . . albumins  
 . . . aspartates  
 . . . calmodulin  
 . . . elastin  
 . . . enzymes  
 . . . . aldolase  
 . . . . amidase  
 . . . . carbonic anhydrase  
 . . . . catalase  
 . . . . cholinesterase  
 . . . . cytochromes  
 . . . . dehydrogenases  
 . . . . hexokinase  
 . . . . lysozyme  
 . . . . nuclease  
 . . . . oxidase  
 . . . . papain  
 . . . . pepsin  
 . . . . phosphatases  
 . . . . protease  
 . . . . renin  
 . . . . thrombin  
 . . . . trypsin  
 . . . fibrin  
 . . . globulins  
 . . . fibrinogen  
 . . . gamma globulin  
 . . . hemoglobin  
 . . . carboxyhemoglobin  
 . . . oxyhemoglobin  
 . . . keratins  
 . . . lipoproteins  
 . . . luminescent proteins  
 . . . melanin  
 . . . myoglobin  
 . . . myosins  
 . . . osteocalcin

## bioprocessing

- . . phytochrome
- . . proteinoids
- . . prothrombin
- . . protoproteins
- . . tumor suppressor proteins
- . lignin
- . polysaccharides
- . . cellulose
- . . . Fortisan (trademark)
- . . chitin
- . . dextrans
- . . glycogens
- . . starches
- . oligonucleotides

RT biopolymer denaturation  
nucleotides  
∞ polymers  
polynucleotides  
polypeptides

### bioprocessing

RT aerospace environments  
bioconversion  
biotechnology  
electrophoresis  
microgravity  
∞ microgravity applications  
pharmacology  
space processing  
spaceborne experiments  
weightlessness

### bioreactors

DEF Biological processors to remove or produce certain chemicals or a particular chemical.

RT ∞ biology  
biomass energy production  
biotechnology  
clinostats  
tissue engineering

### bioregeneration

USE **regeneration (physiology)**

### bioregenerative life support systems

USE **closed ecological systems**

### biorythms

USE **rhythm (biology)**

### BIOS project

GS programs  
. projects  
. . **BIOS project**

### Biosatellite 1

GS artificial satellites  
. biosatellites  
. . **Biosatellite 1**  
RT bioastronautics

### Biosatellite 2

GS artificial satellites  
. biosatellites  
. . **Biosatellite 2**  
RT bioastronautics

### Biosatellite 3

GS artificial satellites  
. biosatellites  
. . **Biosatellite 3**  
RT ∞ astronautics  
bioastronautics

### biosatellites

SN (EXCLUDES MANNED SPACECRAFT)

DEF Artificial satellites which are specifically designed to contain and support man, animals, or other living material in a reasonably normal manner for an adequate period of time and which, particularly for man and animals, possesses the proper means for safe return to the Earth.

GS artificial satellites  
. **biosatellites**  
. . Biosatellite 1  
. . Biosatellite 2  
. . Biosatellite 3  
. . Orbiting Frog Otolith  
. . Sputnik 2 satellite

RT aerospace environments  
∞ biology  
biopaks  
environmental control  
extraterrestrial life  
life detectors  
life support systems  
manned spacecraft  
space capsules  
∞ spacecraft

### biosensors

USE **bioinstrumentation**

### biosimulation

USE **bionics**

### biosphere

DEF That transition zone between Earth and atmosphere within which most forms of terrestrial life are commonly found; the outer portion of the geosphere and inner or lower portion of the atmosphere.

RT ∞ biology  
chemosphere  
Earth hydrosphere  
free atmosphere  
Gaia hypothesis  
homosphere  
International Geosphere-Biosphere program  
lower atmosphere

### biosynthesis

RT biological diversity  
∞ biology  
chemical reactions  
genetic engineering  
metabolites  
prostaglandins  
∞ synthesis  
synthetic food

### Biot method

RT calculus of variations  
∞ methodology

### Biot number

DEF A standard heat transfer dimensionless number.

GS dimensionless numbers  
. **Biot number**  
ratios  
. **Biot number**  
RT heat transfer  
∞ numbers

### biotechnology

DEF The application of engineering and technological principles to the life sciences.

GS technologies  
. **biotechnology**  
. . tissue engineering  
RT artificial cardiac pacemaker  
artificial heart valves  
∞ biology  
bioprocessing  
bioreactors  
blood pumps  
clone cells  
cloning (biology)  
cultured cells  
heart implantation  
in vitro methods and tests  
in vivo methods and tests  
man machine systems  
stem cells

### biotelemetry

DEF The remote sensing and evaluation of life functions, as, e.g., in spacecraft and artificial satellites. Used for physiological telemetry.

UF *physiological telemetry*  
GS bioengineering  
. bioinstrumentation  
. . **biotelemetry**  
telecommunication  
. telemetry  
. . **biotelemetry**  
transmission

. signal transmission

. . telemetry  
. . . **biotelemetry**

RT ∞ biology  
communication equipment  
∞ engineering  
Orbiting Frog Otolith  
pneumography  
telemedicine  
wildlife radiolocation

### biotin

UF *vitamin B complex*  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **biotin**  
vitamins  
. **biotin**  
RT drugs

### biotite

DEF A widely distributed and important rock-forming mineral of the mica group. Used for kimberlite.

UF *kimberlite*  
GS minerals  
. mica  
. . **biotite**

### Biot-Savart law

(added August 1998)

DEF Law describing the intensity of a magnetic field produced by a current carrying wire. Also applied in fluid dynamics to describe the flow-velocity field induced by a vortex.

GS laws  
. **Biot-Savart law**  
RT electromagnetism  
flow velocity  
magnetic fields  
Maxwell equation  
vortices

### biphase shift keying

USE **binary phase shift keying**

### biplanes

GS **biplanes**  
. AN-2 aircraft  
RT ∞ aircraft  
dual wing configurations  
light aircraft  
monoplanes  
tandem wing aircraft  
utility aircraft

### bipolar transistors

GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . transistors  
. . . . **bipolar transistors**  
RT bipolarity  
carrier injection  
epitaxy  
majority carriers  
minority carriers  
n-p-n junctions  
semiconductors (materials)

### bipolarity

DEF Capability of assuming negative or positive values.

RT bipolar transistors  
∞ polarization

### bipropellants

USE **liquid rocket propellants**

### bird-aircraft collisions

GS accidents  
. aircraft accidents  
. . **bird-aircraft collisions**  
collisions  
. midair collisions  
. . **bird-aircraft collisions**  
RT ∞ aircraft  
aircraft hazards  
birds

flight hazards  
ingestion (engines)

**birds**

GS animals  
. vertebrates  
. . . **birds**  
. . . chickens  
. . . pigeons  
. . . turkeys  
. . . waterfowl  
RT aircraft hazards  
bird-aircraft collisions  
Earth resources  
endangered species  
flight hazards  
homeotherms  
plumage  
wildlife

**birefringence**

DEF A double-refraction phenomenon in which an unpolarized beam of light is divided into two beams with different directions and relative velocities of propagation. The amount of energy transmitted along an optical path through a crystal which exhibits birefringence and is a function of crystalline orientation. Used for Pockels effect.

UF *Pockels effect*  
GS electromagnetic properties  
. optical properties  
. . . **birefringence**  
. . . Kerr electrooptical effect  
refraction  
. **birefringence**  
. . . Kerr electrooptical effect  
RT anisotropic media  
anisotropy  
birefringent coatings  
birefringent filters  
calcite  
electro-optics  
Moire effects  
nonlinear optics  
photoelasticity  
polarization (waves)  
reflectance  
refractivity  
temperature inversions  
Voigt effect

**birefringent coatings**

GS coatings  
. optical coatings  
. . . **birefringent coatings**  
RT anisotropic media  
birefringence  
birefringent filters  
refractivity

**birefringent filters**

GS electromagnetic wave filters  
. optical filters  
. . . **birefringent filters**  
RT birefringence  
birefringent coatings  
 $\infty$  filters  
optical properties  
refractivity

**Birkeland currents**

(added May 1989)

GS electric current  
. field aligned currents  
. . . **Birkeland currents**  
. . . ionospheric currents  
. . . **Birkeland currents**  
electricity  
. atmospheric electricity  
. . . ionospheric currents  
. . . **Birkeland currents**  
RT auroral electrojets  
auroral zones  
electrojets  
geomagnetism  
ionospheric disturbances  
magnetic disturbances  
magnetic storms

Pedersen currents

**birth**

RT fertilization  
fetuses  
pregnancy  
reproduction (biology)  
reproductive systems

**bismaleimide**

GS nitrogen compounds  
. amides  
. . . polyimides  
. . . **bismaleimide**  
. imides  
. . . **bismaleimide**  
RT matrix materials  
polyimide resins  
polymer matrix composites  
resin matrix composites  
resins

**bismuth**

GS chemical elements  
. **bismuth**  
. . . bismuth isotopes  
metals  
. **bismuth**  
. . . bismuth isotopes

*bismuth 205*

USE **bismuth isotopes**

**bismuth alloys**

GS alloys  
. **bismuth alloys**  
RT antimony alloys  
eutectic alloys  
magnesium alloys  
tin alloys

**bismuth compounds**

GS **bismuth compounds**  
. bismuth oxides  
. bismuth sulfides  
. bismuth tellurides  
RT  $\infty$  chemical compounds  
 $\infty$  Group 5A compounds  
 $\infty$  metal compounds

**bismuth isotopes**

UF *bismuth 205*  
GS chemical elements  
. bismuth  
. . . **bismuth isotopes**  
. nuclides  
. . . isotopes  
. . . . **bismuth isotopes**  
metals  
. bismuth  
. . . **bismuth isotopes**

**bismuth oxides**

GS bismuth compounds  
. **bismuth oxides**  
chalcogenides  
. oxides  
. . . metal oxides  
. . . . **bismuth oxides**  
RT BSCCO superconductors

**bismuth sulfides**

GS bismuth compounds  
. **bismuth sulfides**  
chalcogenides  
. sulfides  
. . . inorganic sulfides  
. . . . **bismuth sulfides**  
sulfur compounds  
. sulfides  
. . . inorganic sulfides  
. . . . **bismuth sulfides**

**bismuth tellurides**

GS bismuth compounds  
. **bismuth tellurides**  
chalcogenides  
. tellurides  
. . . **bismuth tellurides**  
tellurium compounds

. tellurides  
. . . **bismuth tellurides**

**bisphenols**

GS hydroxyl compounds  
. alcohols  
. . . phenols  
. . . . **bisphenols**

*Bi-Sr-Ca-Cu-O superconductors*

USE **BSCCO superconductors**

*bistable amplifiers*

USE **flip-flops**

**bistable circuits**

GS circuits  
. **bistable circuits**  
. . . flip-flops  
RT digital techniques  
multivibrators  
trigger circuits

*bistatic radar*

USE **multistatic radar**

**bistatic reflectivity**

DEF The characteristic of a reflector which reflects energy along a line, or lines, different from, or in addition to, that of the incident ray.

RT brightness  
incident radiation  
reflectance  
scattering

**bit error rate**

DEF The number of erroneous bits or characters received from some fixed number of bits transmitted.

GS rates (per time)  
. **bit error rate**  
RT binary codes  
binary data  
binary digits  
bit synchronization  
bits  
error analysis  
error correcting codes  
error detection codes  
error signals  
pulse communication  
Reed-Solomon codes  
signal to noise ratios  
transmission efficiency  
transmission rate (communications)

**bit synchronization**

GS synchronism  
. **bit synchronization**  
RT bit error rate  
frequency synchronization

**biternary code**

RT  $\infty$  codes  
differential pulse code modulation  
digital systems  
pulse code modulation

**bits**

RT binary digits  
bit error rate  
drill bits

**bitumens**

DEF Dark-colored (solid, semisolid, or viscous) cementitious substances, natural or manufactured, composed principally of high molecular weight hydrocarbons, of which asphalts, tars, pitches, and asphaltenes are typical.

RT carbon  
coal  
coke  
 $\infty$  construction materials  
lignite  
 $\infty$  materials  
solvent refined coal

**bivariate analysis**

GS statistical analysis  
. variance (statistics)  
. . . multivariate statistical analysis

## BL Lacertae objects

. . . **bivariate analysis**

RT correlation

### BL Lacertae objects

DEF One of a class of astronomical objects exhibiting: (1) rapid variations in intensity at radio, infrared, and optical wavelengths; (2) energy distributions largely at infrared wavelengths; (3) absence of discrete features in low dispersion spectra; and (4) strong and rapidly varying polarization at visual and radio wavelengths.

GS celestial bodies  
. blazars

. . **BL Lacertae objects**

RT extragalactic radio sources  
galaxies  
irregular galaxies  
luminous intensity  
polarization (waves)  
radiant flux density  
radio sources (astronomy)

### black and white photography

GS imagery  
. photography  
. . **black and white photography**

RT all sky photography  
astronomical photography  
autoradiography  
chronophotography  
cinematography  
cloud photography  
color photography  
electron photography  
electro-optical photography  
frame photography  
infrared photography  
lunar photography  
photomicrography  
photoreconnaissance  
radar photography  
rocket-borne photography  
satellite-borne photography  
Schlieren photography  
shadowgraph photography  
spaceborne photography  
spectroheliographs  
spectrophotography  
stereophotography  
ultraviolet photometry  
urography

*Black Arrow launch vehicle*

USE **Black Knight rocket vehicle**

### black body radiation

DEF The electromagnetic radiation emitted by an ideal black body; it is the theoretical maximum amount of radiant energy of all wavelengths which can be emitted by a body at a given temperature.

GS electromagnetic radiation  
. thermal radiation

. . **black body radiation**

RT brightness distribution  
brightness temperature  
emissivity  
heat radiators  
hohlraums  
infrared radiation  
Kirchhoff law of radiation  
light (visible radiation)  
nongray atmospheres  
nongray gas  
Plancks constant  
radiance  
∞ radiation  
sunlight  
ultraviolet radiation

### Black Brant 1 sounding rocket

GS rocket vehicles  
. single stage rocket vehicles  
. . Black Brant sounding rockets  
. . . **Black Brant 1 sounding rocket**  
. sounding rockets  
. . Black Brant sounding rockets  
. . . **Black Brant 1 sounding rocket**

RT solid propellant rocket engines

### Black Brant 2 sounding rocket

GS rocket vehicles  
. single stage rocket vehicles  
. . Black Brant sounding rockets  
. . . **Black Brant 2 sounding rocket**  
. sounding rockets  
. . Black Brant sounding rockets  
. . . **Black Brant 2 sounding rocket**  
RT solid propellant rocket engines

### Black Brant 3 sounding rocket

GS rocket vehicles  
. single stage rocket vehicles  
. . Black Brant sounding rockets  
. . . **Black Brant 3 sounding rocket**  
. sounding rockets  
. . Black Brant sounding rockets  
. . . **Black Brant 3 sounding rocket**  
RT solid propellant rocket engines

### Black Brant 4 sounding rocket

GS rocket vehicles  
. single stage rocket vehicles  
. . Black Brant sounding rockets  
. . . **Black Brant 4 sounding rocket**  
. sounding rockets  
. . Black Brant sounding rockets  
. . . **Black Brant 4 sounding rocket**  
RT solid propellant rocket engines

### Black Brant 5 sounding rocket

GS rocket vehicles  
. single stage rocket vehicles  
. . Black Brant sounding rockets  
. . . **Black Brant 5 sounding rocket**  
. sounding rockets  
. . Black Brant sounding rockets  
. . . **Black Brant 5 sounding rocket**  
RT solid propellant rocket engines

### Black Brant sounding rockets

GS rocket vehicles  
. single stage rocket vehicles  
. . **Black Brant sounding rockets**  
. . . Black Brant 1 sounding rocket  
. . . Black Brant 2 sounding rocket  
. . . Black Brant 3 sounding rocket  
. . . Black Brant 4 sounding rocket  
. . . Black Brant 5 sounding rocket  
. sounding rockets  
. . **Black Brant sounding rockets**  
. . . Black Brant 1 sounding rocket  
. . . Black Brant 2 sounding rocket  
. . . Black Brant 3 sounding rocket  
. . . Black Brant 4 sounding rocket  
. . . Black Brant 5 sounding rocket  
RT solid propellant rocket engines

*Black Hawk assault helicopter*

USE **H-60 Helicopter**

### Black Hills (SD-WY)

GS landforms  
. mountains  
. . **Black Hills (SD-WY)**  
RT South Dakota  
Wyoming

### black holes (astronomy)

GS celestial bodies  
. stars  
. . **black holes (astronomy)**  
RT accretion disks  
degenerate matter  
event horizon  
gravitational collapse  
gravitational lenses  
massive stars  
naked singularities  
Reissner-Nordstrom solution  
supernova remnants  
white holes (astronomy)  
x ray binaries

### Black Knight rocket vehicle

UF *Black Arrow launch vehicle*  
GS rocket vehicles  
. multistage rocket vehicles

. . **Black Knight rocket vehicle**

. single stage rocket vehicles  
. . **Black Knight rocket vehicle**  
RT liquid propellant rocket engines

### Black Sea

GS seas  
. **Black Sea**  
RT Bulgaria  
Romania  
Turkey  
U.S.S.R.

*black smokers (oceanography)*  
(added April 2005)

USE **submarine hydrothermal vents**

*Blackbird aircraft*

USE **SR-71 aircraft**

*Blackburn B-103 aircraft*

USE **Buccaneer aircraft**

### ∞ blackout

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT blackout (physiology)  
blackout (propagation)

### blackout (physiology)

GS syncope  
. **blackout (physiology)**  
. . blackout prevention  
unconsciousness  
. **blackout (physiology)**  
. . blackout prevention  
RT acceleration tolerance  
∞ blackout  
∞ coma

### blackout (propagation)

UF *ionospheric blackout*  
GS electromagnetic interference  
. radio frequency interference  
. . **blackout (propagation)**  
. . . polar radio blackout  
RT atmospheric  
∞ blackout  
electromagnetic fields  
electromagnetic noise  
ionospheric disturbances  
plasma sheaths  
plasmas (physics)  
radiation effects  
radio communication  
reentry communication  
reentry effects  
solar activity effects  
x rays

### blackout prevention

GS human performance  
. astronaut performance  
. . **blackout prevention**  
. pilot performance  
. . **blackout prevention**  
syncope  
. blackout (physiology)  
. . **blackout prevention**  
unconsciousness  
. blackout (physiology)  
. . **blackout prevention**  
RT acceleration tolerance  
∞ coma  
weightlessness

### bladder

GS anatomy  
. genitourinary system  
. . **bladder**  
RT prostate gland

urology

*bladders (mechanics)*  
USE **diaphragms (mechanics)**

*blade slap*  
USE **blade-vortex interaction**

**blade slap noise**  
DEF Impulsive noise (short high pressure sound waves) of rotating blades, primarily helicopter blades. Used for helicopter impulsive noise.

UF *helicopter impulsive noise*  
GS elastic waves  
. sound waves  
. . noise (sound)  
. . . aircraft noise  
. . . . **blade slap noise**  
. . . flow noise  
. . . . aerodynamic noise  
. . . . . **blade slap noise**

RT blade tips  
blade-vortex interaction  
Flowcs Williams-Hawkings equation  
helicopters  
propeller noise

**blade tips**

GS tips  
. **blade tips**  
RT airfoil profiles  
blade slap noise  
blade-vortex interaction  
propeller blades  
rotary wings  
rotor blades (turbomachinery)  
wing tips

∞ **blades**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Arms of propeller and rotating wings. Specifically, restrictive, those parts of propellers or of rotating wings from the shank outward, i.e., those parts having efficient airfoil shapes and that cleave the air. Vanes such as rotating vanes or stationary vanes in rotary air compressors, or vanes of turbine wheels.

RT airfoils  
blades (cutters)  
compressor blades  
fins  
hydrofoils  
propeller blades  
rims  
rotary wings  
rotor blades (turbomachinery)  
stator blades  
turbine blades  
turbomachine blades  
vanes

**blades (cutters)**

GS cutters  
. **blades (cutters)**  
. . razor blades  
RT ∞ blades

**blade-vortex interaction**

UF *blade slap*  
*vortex-blade interaction*  
RT airfoils  
blade slap noise  
blade tips  
helicopters  
interactional aerodynamics  
∞ interactions  
rotary wings  
vortices  
wing tip vortices

∞ **blankets**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT bedding equipment  
blankets (fission reactors)  
blankets (fusion reactors)  
cloud cover

controlled atmospheres  
solar blankets

**blankets (fission reactors)**

DEF Damper materials for fission reactors.  
RT ∞ blankets  
∞ dampers  
fission  
reactor design  
reactor materials

**blankets (fusion reactors)**

DEF Damper materials for fusion reactors.  
RT ∞ blankets  
fusion reactors  
limiters (fusion reactors)  
moderators  
reactor design  
reactor materials

∞ **blanking**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT blanking (cutting)  
forming techniques  
stamping

**blanking (cutting)**

GS cutting  
. **blanking (cutting)**  
forming techniques  
. pressing (forming)  
. . **blanking (cutting)**  
RT ∞ blanking  
laser cutting  
shearing  
stamping

**blanks**

RT ammunition  
briquets  
forms (paper)  
preforms

**Blasius equation**

GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . **Blasius equation**  
flow equations  
. boundary layer equations  
. . **Blasius equation**  
RT boundary layer flow  
∞ equations  
Falkner-Skan equation  
flat plates  
Prandtl-Meyer expansion

**Blasius flow**

GS fluid flow  
. laminar flow  
. . **Blasius flow**  
. . uniform flow  
. . . **Blasius flow**  
RT flat plates  
head flow  
Tollmien-Schlichting waves  
turbulent flow  
two dimensional flow  
wedge flow

**blast deflectors**

DEF Devices used to divert the exhaust of a rocket fired from a vertical position.

GS deflectors  
. **blast deflectors**  
RT baffles  
diverters  
flame deflectors  
shielding

**blast loads**

GS aerodynamic forces  
. aerodynamic loads  
. . **blast loads**  
loads (forces)  
. dynamic loads  
. . aerodynamic loads  
. . . **blast loads**  
. . transient loads

. . . shock loads  
. . . . **blast loads**  
RT aerial explosions  
dynamic pressure  
explosions  
gust loads  
impact loads  
overpressure  
pressure  
pressure pulses  
Riemann waves  
shock waves  
wave resistance

*blastoff*

USE **rocket launching**

∞ **blasts**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT exhaust gases  
explosions  
jet blast effects  
shock waves  
sound waves

*Blattidae*

USE **cockroaches**

**blazars**

(added December 1988)

DEF Strongly optical polarized active galactic nuclei objects exhibiting BL Lacertae-like and quasar-like characteristics.

GS celestial bodies  
. **blazars**  
. . BL Lacertae objects  
RT accretion disks  
active galactic nuclei  
active galaxies  
disk galaxies  
extragalactic radio sources  
infrared astronomy  
quasars  
radio galaxies  
radio sources (astronomy)  
Seyfert galaxies

**bleaching**

RT chlorination  
cleaning  
fading

∞ **bleeding**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT boundary layer control  
fluid mechanics  
hemorrhages  
pressure reduction

*bleed-off*

USE **pressure reduction**

**blended-wing-body configurations**

(added April 2001)

DEF Flight vehicle configurations that maximize overall efficiency by integrating the engines, wings, and the body into a single lifting surface. Sometimes referred to as flying-wing configurations.

UF *blended-wing-fuselage*  
*BWB configurations*

*flying wing configurations*  
GS aerodynamic configurations  
. body-wing configurations  
. . **blended-wing-body**  
configurations

RT aircraft configurations  
aircraft design  
SR-71 aircraft

## blight

tailless aircraft

*blended-wing-fuselage*  
(added April 2001)

USE **blended-wing-body configurations**

*blends*

USE **mixtures**

## blight

GS plant diseases

. **blight**

RT

alfalfa  
bacteria  
barley  
botany  
citrus trees  
corn  
crop growth  
crop vigor  
fungi  
orchards  
parasites  
parasitic diseases  
plants (botany)  
rhizopus  
rust fungi  
vineyards

## blind landing

GS landing

. **blind landing**

RT

aircraft landing  
approach indicators  
automatic landing control  
instrument approach  
instrument flight rules  
instrument landing systems  
landing instruments  
night flights (aircraft)

## blindness

GS **blindness**

. flash blindness

RT

braille  
disabilities  
eye diseases  
optometry  
vision

## blinds

RT shielding

∞ shutters

## blinking

RT astronomical photometry  
display devices  
eye movements  
visual perception

## ∞ blisters

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED—CONSULT THE TERMS  
LISTED BELOW)

RT

infectious diseases  
injuries  
mucocoeles  
protuberances  
rupturing  
skin (anatomy)  
viruses

## Bloch band

GS energy bands

. **Bloch band**

RT ∞

bands  
superconductivity

## block copolymers

(added January 1990)

GS copolymers

. **block copolymers**

RT

copolymerization  
micelles  
polybutadiene  
∞ polymers  
polystyrene

## block diagrams

GS diagrams

. **block diagrams**

RT charts

computer programming  
computer programs  
flow charts  
research management  
systems analysis

## Block Island Sound (RI)

GS sounds (topographic features)

. **Block Island Sound (RI)**

RT

Atlantic Ocean  
Rhode Island

## blocking

UF *obstructing*

RT ∞

arresters  
closing  
closures  
constraints  
constrictions  
containment  
plugging  
plugs  
prevention  
retarders (devices)  
retarding  
sealing  
seals (stoppers)  
stopping

## blocks

RT cubes (mathematics)

pulleys  
slabs

## bleoedite

DEF A mineral consisting of hydrous sodium magnesium sulfate that is colorless. Also known as astrakanite or astrochanite.

GS minerals

. **bleoedite**

RT

magnesium sulfates  
sodium compounds  
sulfur compounds

## blood

GS body fluids

. **blood**

. . fibrin

. . fibrinogen

. . thrombin

. . thromboplastin

RT

anemias  
biocompatibility  
blood cell count  
blood cells  
blood circulation  
blood coagulation  
blood flow  
blood groups  
blood plasma  
blood pressure  
blood pumps  
blood vessels  
blood volume  
blood-brain barrier  
capillaries (anatomy)  
carboxyhemoglobin test  
cardiovascular system  
coagulation  
heart  
hematocrit  
hematopoiesis  
hemoglobin  
hemorrhages  
hypercapnia  
hypocapnia  
oximetry  
Rhesus factor  
transfusion

## blood cell count

(added August 2004)

DEF The number of leukocytes and erythrocytes per unit volume in a sample of venous blood. A complete blood count (CBC) also includes measurement of the hemoglobin; hematocrit, and erythrocyte indices.

RT

anemias  
blood

blood cells  
blood volume  
cytology  
erythrocytes  
hematocrit  
hematocrit ratio  
hematology  
hematopoiesis  
hemoglobin  
leukocytes  
lymphocytes  
monocytes  
platelets

## blood cells

UF *corpuscles (blood)*

GS cells (biology)

. **blood cells**

. . erythrocytes

. . . reticulocytes

. . hemocytes

. . leukocytes

. . . eosinophils

. . . lymphocytes

. . . monocytes

. . . neutrophils

RT

anemias  
blood  
blood cell count  
blood plasma  
hematopoiesis  
hematopoietic system  
hemoglobin

## blood circulation

GS circulation

. **blood circulation**

. . brain circulation

. . coronary circulation

. . intercranial circulation

. . ocular circulation

. . peripheral circulation

. . pulmonary circulation

RT

artificial cardiac pacemaker  
artificial heart valves  
blood  
blood-brain barrier  
carboxyhemoglobin  
circulatory system  
cyanosis  
diastole  
electroplethysmography  
heart conduction system  
heart function  
heart implantation  
hematocrit  
hemodynamic responses  
hemodynamics  
hypervolemia  
hypovolemia  
intravascular system  
ischemia  
phonoarteriography  
physiology  
rheoencephalography  
rheometers  
tourniquets  
vasodilator agents

## blood coagulation

GS coagulation

. **blood coagulation**

RT

blood  
clotting  
fibrin  
hemostatics  
myocardial infarction  
platelets  
thrombin  
thrombocytes  
thromboplastin  
thrombosis

## blood flow

GS fluid flow

. **blood flow**

RT

blood  
capillary flow  
diastole  
hematocrit

- hemoperfusion
- systole
- tourniquets
- blood groups**
  - RT blood
  - platelets
- blood plasma**
  - RT blood
  - blood cells
  - body fluids
  - electrolyte metabolism
  - hematocrit
- blood pressure**
  - GS pressure
    - . **blood pressure**
    - . . diastolic pressure
    - . . hypertension
    - . . hypotension
    - . . lower body negative pressure
    - . . systolic pressure
  - RT baroreflexes
  - biofeedback
  - blood
  - diastole
  - heart function
  - hemodynamic responses
  - hemoperfusion
  - manometers
  - ophthalmodynamometry
  - orthostatic tolerance
  - sphygmography
  - systole
  - ∞ tension
- blood pumps**
  - GS medical equipment
    - . **blood pumps**
    - pumps
    - . **blood pumps**
  - RT artificial heart valves
  - biotechnology
  - blood
  - circulatory system
  - heart
  - pulmonary circulation
- blood serum**
  - (added April 2004)
  - DEF The clear portion of blood that is left after blood coagulation to remove blood cells and clotting proteins.
  - GS serums
    - . **blood serum**
- blood vessels**
  - GS anatomy
    - . circulatory system
    - . . cardiovascular system
    - . . . **blood vessels**
    - . . . . arteries
    - . . . . . aorta
    - . . . . . arterioles
    - . . . . . capillaries (anatomy)
    - . . . . . glomerulus
    - . . . . . veins
  - RT angiogenesis
  - bifurcation (biology)
  - blood
  - carotid sinus body
  - carotid sinus reflex
  - catheterization
  - embolisms
  - endothelium
  - fat embolisms
  - vasoconstriction
  - vasodilation
  - vasodilator agents
  - ∞ vessels
- blood volume**
  - RT blood
  - blood cell count
  - cardiac output
  - cardiovascular system
  - chronic conditions
  - clinical medicine
  - hematocrit
- hematopoietic system
- hemodynamics
- hypovolemia
- hypovolemia
- stroke volume
- blood-brain barrier**
  - DEF A mechanism which maintains the constancy of the neurons in the central nervous system by preventing certain substances from leaving the bloodstream and entering the neural tissue.
  - RT ∞ barriers
    - blood
    - blood circulation
    - central nervous system
    - neurons
- blowdown wind tunnels**
  - GS test facilities
    - . wind tunnels
    - . . **blowdown wind tunnels**
  - RT hotshot wind tunnels
  - hypersonic wind tunnels
  - hypervelocity wind tunnels
  - low density research
  - low speed wind tunnels
  - subsonic wind tunnels
  - supersonic wind tunnels
  - transonic wind tunnels
- blowers**
  - RT air conditioning
  - air conditioning equipment
  - air ducts
  - blowing
  - centrifugal compressors
  - compressors
  - cooling systems
  - ducted fans
  - exhaust systems
  - ∞ fans
    - impellers
    - injectors
    - materials handling
    - mixers
  - ∞ nozzles
    - refrigerating machinery
    - sealing
    - sprayers
    - superchargers
    - turbomachinery
    - ventilation
    - ventilation fans
    - ventilators
- blowing**
  - GS **blowing**
    - . spanwise blowing
    - . tangential blowing
    - . under surface blowing
    - . upper surface blowing
  - RT aeration
  - agitation
  - blowers
  - boundary layer control
  - circulation
  - circulation control airfoils
  - compressing
  - entrainment
  - exhausting
  - externally blown flaps
  - forced convection
  - injection
  - mixing
  - ∞ pumping
    - spraying
    - upper surface blown flaps
    - wind (meteorology)
- blown flaps*
  - USE **externally blown flaps**
- blowoff (combustion)*
  - USE **flameout**
- blowouts**
  - RT fatigue life
- tires
- Blue Goose missile**
  - GS decoys
    - . **Blue Goose missile**
    - missiles
    - . surface to air missiles
    - . . **Blue Goose missile**
  - RT booster rocket engines
  - countermeasures
  - J-85 engine
  - solid propellant rocket engines
- blue green algae**
  - UF *Cyanophyta*
  - GS plants (botany)
    - . algae
    - . . **blue green algae**
    - . . . anabaena
    - . . . Microcystis
    - . . . Nostoc
    - . thermophilic plants
    - . . **blue green algae**
    - . . . anabaena
    - . . . Microcystis
    - . . . Nostoc
- Blue Scout rocket vehicle**
  - GS launch vehicles
    - . **Blue Scout rocket vehicle**
    - rocket vehicles
    - . multistage rocket vehicles
    - . . **Blue Scout rocket vehicle**
  - RT Algol engine
  - solid propellant rocket engines
  - X-248 engine
  - X-254 engine
  - XM-33 engine
- blue shift**
  - (added February 2002)
  - DEF The displacement of observed spectral lines toward the shorter wavelengths of the blue end of the spectrum.
  - RT absorption spectra
  - astronomical spectroscopy
  - Doppler effect
  - Doppler-Fizeau effect
  - emission spectra
  - energy gaps (solid state)
  - photoluminescence
  - quantum wells
  - radial velocity
  - red shift
- blue stars**
  - DEF Stars of spectral type O, B, A, or F according to the Draper catalog.
  - GS celestial bodies
    - . stars
    - . . early stars
    - . . . hot stars
    - . . . . **blue stars**
  - RT A stars
  - B stars
  - F stars
  - O stars
- Blue Steel missile**
  - GS missiles
    - . **Blue Steel missile**
  - RT liquid propellant rocket engines
- Blue Streak launch vehicle**
  - GS launch vehicles
    - . **Blue Streak launch vehicle**
    - rocket vehicles
    - . **Blue Streak launch vehicle**
  - RT Eldo launch vehicle
  - liquid propellant rocket engines
- Blue Streak missile**
  - GS missiles
    - . ballistic missiles
    - . . intermediate range ballistic missiles
    - . . . **Blue Streak missile**
    - . surface to surface missiles
    - . . intermediate range ballistic missiles
    - . . . **Blue Streak missile**
    - rocket vehicles



## blueprints

. **Blue Streak missile**  
RT liquid propellant rocket engines

### blueprints

GS documents  
. drawings  
. . engineering drawings  
. . . **blueprints**  
RT layouts  
reproduction (copying)

### bluff bodies

DEF Bodies having a broad, flattened front, as in some reentry vehicles.  
RT blunt bodies  
∞ bodies  
ducted bodies  
forebodies  
lifting bodies  
reentry vehicles  
Roshko prediction

*bluffs (landforms)*

USE **cliffs**

### blunt bodies

RT aerodynamic configurations  
aerodynamics  
axisymmetric bodies  
bluff bodies  
∞ bodies  
ducted bodies  
forebodies  
missile bodies  
nose cones  
power law bodies  
stagnation point  
symmetrical bodies

### blunt leading edges

DEF The obtuse cross sections of certain front edges of airfoils or wings.

GS edges  
. leading edges  
. . **blunt leading edges**  
RT airfoils  
forebodies  
trailing edges

### blunt trailing edges

DEF The rounded or obtuse angled trailing edges of wings and/or control surfaces designed to enhance aerodynamic characteristics.

GS edges  
. trailing edges  
. . **blunt trailing edges**  
RT airfoils  
control surfaces  
wings

### blurring

RT aberration  
resolution  
spatial filtering

*BMC*

USE **bone mineral content**

*BMEWS*

USE **Ballistic Missile Early Warning System**

### BO-105 helicopter

GS Bolkow aircraft  
. **BO-105 helicopter**  
passenger aircraft  
. **BO-105 helicopter**  
utility aircraft  
. **BO-105 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **BO-105 helicopter**

### boards (paper)

UF *fiberboard*  
RT ∞ construction materials  
paper (material)

papers

### boats

GS surface vehicles  
. **boats**  
. . lifeboats  
water vehicles  
. **boats**  
. . lifeboats  
RT amphibious vehicles  
harbors  
inflatable structures  
keels  
∞ military vehicles  
research vehicles  
ships  
underwater vehicles

### boattails

DEF The rear portions of elongated bodies, as in rockets, having decreasing cross-sectional area toward the rear.

RT afterbodies  
skirts  
tail assemblies

*BOD*

USE **biochemical oxygen demand**

### ∞ bodies

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT afterbodies  
axisymmetric bodies  
bluff bodies  
blunt bodies  
bodies of revolution  
celestial bodies  
centerbodies  
ducted bodies  
elastic bodies  
finned bodies  
flexible bodies  
foreign bodies  
Herbig-Haro objects  
human body  
lenticular bodies  
lifting bodies  
maneuverable reentry bodies  
missile bodies  
platforms  
plastic bodies  
pyramidal bodies  
reentry vehicles  
rotating bodies  
slender bodies  
solids  
streamlined bodies  
symmetrical bodies  
three dimensional bodies  
towed bodies  
two dimensional bodies

### bodies of revolution

DEF Symmetrical bodies having the form described by rotating a plane curve about an axis in its plane.

GS symmetrical bodies  
. **bodies of revolution**  
. . conical bodies  
. . . slender cones  
. . cylindrical bodies  
. . . rotating cylinders  
. . parabolic bodies  
. . power law bodies  
. . spheres  
. . . celestial sphere  
. . . concentric spheres  
. . . falling spheres  
. . . Poincare spheres  
. . . rotating spheres  
. . toruses  
RT aerodynamic configurations  
aerodynamics  
axes of rotation  
axisymmetric bodies  
∞ bodies  
cones  
disks (shapes)

ellipsoids  
finned bodies  
geometry  
∞ hemispheres  
hemispherical shells  
ogives  
∞ rings  
spherical shells  
streamlined bodies

### body centered cubic lattices

UF *BCC lattices*  
GS crystal lattices  
. cubic lattices  
. . **body centered cubic lattices**  
RT close packed lattices  
cluster variation method  
crystals  
face centered cubic lattices

### body composition (biology)

GS composition (property)  
. **body composition (biology)**  
RT ∞ biology  
chemical composition  
exoskeletons

### body fluids

GS **body fluids**  
. blood  
. . fibrin  
. . fibrinogen  
. . thrombin  
. . thromboplastin  
. cerebrospinal fluid  
. endolymph  
. lymph  
. mucus  
. saliva  
. sweat  
. urine  
RT blood plasma  
diuresis  
edema  
electrolyte metabolism  
fluid shifts (biology)  
∞ fluids  
isotonicity  
lysozyme  
mineral metabolism  
obesity  
perspiration  
secretions  
water  
water balance

### body kinematics

GS kinematics  
. **body kinematics**  
RT acceleration (physics)  
acceleration stresses (physiology)  
kinetics  
particle theory  
velocity

### body measurement (biology)

SN (LIMITED TO BIOLOGICAL APPLICATIONS--FOR MEASUREMENT OF NON-BIOLOGICAL BODIES USE SIZE DETERMINATION)  
GS bioengineering  
. biometrics  
. . **body measurement (biology)**  
. . . anthropometry  
. . . electroplethysmography  
RT ∞ biology  
biomedical data  
electrocardiography  
electroencephalography  
electrophysiology  
∞ engineering  
human body  
human factors engineering  
obesity  
size determination  
∞ sizing

### body size (biology)

RT anthropometry  
∞ biology

- obesity
- body sway test**  
 GS physiological tests  
 . **body sway test**  
 RT ∞ equilibrium  
 head down tilt  
 vertical perception  
 vestibular tests
- body temperature**  
 SN (LIMITED TO TEMPERATURE OF BIOLOGICAL BODIES)  
 GS temperature  
 . **body temperature**  
 RT cold tolerance  
 fever  
 heat acclimatization  
 heat stroke  
 heat tolerance  
 homeostasis  
 homeotherms  
 humidity  
 hyperthermia  
 hypothermia  
 perspiration  
 poikilothermia  
 shivering  
 thermoreceptors  
 thermoregulation  
 vasoconstriction  
 vasodilation
- body temperature (non-biological)*  
 USE **temperature**
- body temperature regulation*  
 USE **thermoregulation**
- body volume (biology)**  
 GS volume  
 . **body volume (biology)**  
 RT ∞ biology  
 obesity
- body weight**  
 GS weight (mass)  
 . **body weight**  
 RT obesity  
 weightlessness
- body-wing and tail configurations**  
 UF *wing-body and tail configurations*  
 GS aerodynamic configurations  
 . **body-wing and tail configurations**  
 RT ∞ configurations  
 fuselages  
 tail assemblies  
 wings
- body-wing configurations**  
 UF *wing-body configurations*  
 GS aerodynamic configurations  
 . **body-wing configurations**  
 . . blended-wing-body configurations  
 RT airfoils  
 drooped airfoils  
 GAW-2 airfoil  
 wings
- Boeing 707 aircraft**  
 GS Boeing aircraft  
 . **Boeing 707 aircraft**  
 commercial aircraft  
 . **Boeing 707 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 707 aircraft**  
 monoplanes  
 . **Boeing 707 aircraft**  
 passenger aircraft  
 . **Boeing 707 aircraft**  
 transport aircraft  
 . **Boeing 707 aircraft**  
 RT ∞ aircraft
- Boeing 717 aircraft**  
 (added October 1998)  
 GS Boeing aircraft  
 . **Boeing 717 aircraft**  
 commercial aircraft
- . **Boeing 717 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 717 aircraft**  
 monoplanes  
 . **Boeing 717 aircraft**  
 passenger aircraft  
 . **Boeing 717 aircraft**  
 transport aircraft  
 . **Boeing 717 aircraft**  
 RT ∞ aircraft
- Boeing 720 aircraft**  
 GS Boeing aircraft  
 . **Boeing 720 aircraft**  
 commercial aircraft  
 . **Boeing 720 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 720 aircraft**  
 monoplanes  
 . **Boeing 720 aircraft**  
 passenger aircraft  
 . **Boeing 720 aircraft**  
 transport aircraft  
 . **Boeing 720 aircraft**  
 RT ∞ aircraft
- Boeing 727 aircraft**  
 GS Boeing aircraft  
 . **Boeing 727 aircraft**  
 commercial aircraft  
 . **Boeing 727 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 727 aircraft**  
 passenger aircraft  
 . **Boeing 727 aircraft**  
 transport aircraft  
 . **Boeing 727 aircraft**  
 RT ∞ aircraft  
 cargo aircraft
- Boeing 733 aircraft**  
 GS Boeing aircraft  
 . **Boeing 733 aircraft**  
 commercial aircraft  
 . **Boeing 733 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 733 aircraft**  
 monoplanes  
 . **Boeing 733 aircraft**  
 supersonic aircraft  
 . **Boeing 733 aircraft**  
 transport aircraft  
 . **Boeing 733 aircraft**  
 RT ∞ aircraft  
 variable sweep wings
- Boeing 737 aircraft**  
 GS Boeing aircraft  
 . **Boeing 737 aircraft**  
 commercial aircraft  
 . **Boeing 737 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 737 aircraft**  
 monoplanes  
 . **Boeing 737 aircraft**  
 passenger aircraft  
 . **Boeing 737 aircraft**  
 transport aircraft  
 . **Boeing 737 aircraft**  
 RT ∞ aircraft  
 cargo aircraft
- Boeing 747 aircraft**  
 GS Boeing aircraft  
 . **Boeing 747 aircraft**  
 commercial aircraft  
 . **Boeing 747 aircraft**  
 jet aircraft  
 . **Boeing 747 aircraft**  
 passenger aircraft  
 . **Boeing 747 aircraft**  
 transport aircraft  
 . **Boeing 747 aircraft**  
 RT ∞ aircraft  
 SOFIA (airborne observatory)
- turbofan engines  
 X-34 reusable launch vehicle
- Boeing 747B aircraft*  
 USE **E-4A aircraft**
- Boeing 757 aircraft**  
 DEF Boeing's twin turbofan short/medium range transport aircraft that made its first flight on February 19, 1982.  
 GS Boeing aircraft  
 . **Boeing 757 aircraft**  
 commercial aircraft  
 . **Boeing 757 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 757 aircraft**  
 monoplanes  
 . **Boeing 757 aircraft**  
 passenger aircraft  
 . **Boeing 757 aircraft**  
 transport aircraft  
 . **Boeing 757 aircraft**  
 RT ∞ aircraft
- Boeing 767 aircraft**  
 DEF Boeing's widebodied medium range commercial transport aircraft that made its first flight on September 26, 1981.  
 GS Boeing aircraft  
 . **Boeing 767 aircraft**  
 commercial aircraft  
 . **Boeing 767 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Boeing 767 aircraft**  
 monoplanes  
 . **Boeing 767 aircraft**  
 passenger aircraft  
 . **Boeing 767 aircraft**  
 transport aircraft  
 . **Boeing 767 aircraft**  
 RT ∞ aircraft  
 cargo aircraft  
 turbofan engines
- Boeing 777 aircraft**  
 (added September 1994)  
 GS Boeing aircraft  
 . **Boeing 777 aircraft**  
 commercial aircraft  
 . **Boeing 777 aircraft**  
 jet aircraft  
 . **Boeing 777 aircraft**  
 passenger aircraft  
 . **Boeing 777 aircraft**  
 transport aircraft  
 . **Boeing 777 aircraft**  
 RT ∞ aircraft
- Boeing 2707 aircraft**  
 GS Boeing aircraft  
 . **Boeing 2707 aircraft**  
 commercial aircraft  
 . supersonic commercial air transport  
 . . **Boeing 2707 aircraft**  
 jet aircraft  
 . **Boeing 2707 aircraft**  
 passenger aircraft  
 . **Boeing 2707 aircraft**  
 supersonic aircraft  
 . supersonic transports  
 . . supersonic commercial air transport  
 . . . **Boeing 2707 aircraft**  
 transport aircraft  
 . **Boeing 2707 aircraft**  
 RT ∞ aircraft
- Boeing aircraft**  
 UF *Vertol military helicopters*  
 GS Boeing aircraft  
 . B-47 aircraft  
 . B-50 aircraft  
 . B-52 aircraft  
 . Boeing 707 aircraft  
 . Boeing 717 aircraft  
 . Boeing 720 aircraft  
 . Boeing 727 aircraft  
 . Boeing 733 aircraft

## Bogoliubov theory

- . Boeing 737 aircraft
- . Boeing 747 aircraft
- . Boeing 757 aircraft
- . Boeing 767 aircraft
- . Boeing 777 aircraft
- . Boeing 2707 aircraft
- . C-135 aircraft
- . CH-21 helicopter
- . CH-46 helicopter
- . CH-47 helicopter
- . CH-62 helicopter
- . E-3A aircraft
- . E-4A aircraft
- . H-25 helicopter
- . V-22 aircraft
- . VZ-2 aircraft
- . X-20 aircraft
- . X-32 aircraft

RT  $\infty$  aircraft

- AWACS aircraft
- McDonnell Douglas aircraft
- X-45 aircraft
- YC-14 aircraft

### Bogoliubov theory

RT BBGKY hierarchy

$\infty$  theories

### bogs

USE marshlands

### Bohr magneton

DEF A constant equivalent to the magnetic moment of an electron.

GS constants

- . **Bohr magneton**

RT electrons

magnetic moments

### Bohr theory

GS theoretical physics

- . quantum theory
- . . **Bohr theory**

RT electron transitions

line spectra

$\infty$  theories

### bohrium

(added May 1998)

GS chemical elements

- . **bohrium**

RT hassium

seaborgium

### boiler plate

GS structural members

- . plates (structural members)
- . . metal plates
- . . . **boiler plate**

RT thick walls

### boilers

UF *steam generators*

GS heating equipment

- . **boilers**

RT external combustion engines

furnaces

$\infty$  generators

heat balance

pressure vessels

steam

vaporizers

waste energy utilization

### boiling

UF *ebullition*

GS phase transformations

- . vaporizing
- . . **boiling**
- . . . film boiling
- . . . nucleate boiling
- . . . . Leidenfrost phenomenon

RT effervescence

evaporation

evolution (liberation)

heat transfer

heating

### boiling water reactors

GS nuclear reactors

- . liquid cooled reactors
- . . water cooled reactors
- . . . **boiling water reactors**
- . . . . experimental boiling water reactors
- . . . . . Halden Boiling Water Reactor
- . . . . . Los Alamos Water Boiler Reactor
- . . . . . Pathfinder nuclear reactor
- . . . . . Spert reactors

RT nuclear power reactors

nuclear research and test reactors

### bolides

DEF Brilliant meteors, especially ones which explode; detonating fireballs.

GS celestial bodies

- . meteoroids
- . . **bolides**
- . . . Cyrillid meteoroids

RT atmospheric entry

atmospheric heating

$\infty$  fireballs

meteor trails

meteorites

meteoroid showers

Pribram meteorite

### Bolivia

GS nations

- . **Bolivia**

RT South America

### Bolkow aircraft

GS **Bolkow aircraft**

- . BO-105 helicopter

RT  $\infty$  aircraft

### boll weevils

GS animals

- . invertebrates
- . . arthropods
- . . . insects
- . . . . Coleoptera
- . . . . . **boll weevils**

RT bollworms

cotton

infestation

### bollworms

GS animals

- . invertebrates
- . . arthropods
- . . . insects
- . . . . **bollworms**

larvae

- . **bollworms**

RT boll weevils

corn

cotton

fruits

infestation

moths

### bolograms

USE **bolometers**

### bolometers

DEF Instruments which measure the intensity of radiant energy by employing thermally sensitive electrical resistors; a type of actinometer. Used for bolograms.

UF *bolograms*

GS measuring instruments

- . radiation measuring instruments
- . . **bolometers**

RT Dicke radiometers

electrical measurement

heat measurement

infrared detectors

photometers

potentiometers (instruments)

radiation pyrometers

radiometers

resistance thermometers

temperature measurement

temperature measuring instruments

x ray detectors

### bolted joints

DEF Joints fastened with bolts. They are usually designed for heavy loads.

GS joints (junctions)

- . **bolted joints**

RT bolts

- lap joints
- riveted joints
- scarf joints

### bolts

GS fasteners

- . **bolts**
- . . rock bolts
- . . tiebolts

RT anchors (fasteners)

bolted joints

couplings

holders

nuts (fasteners)

screws

studs (structural members)

threads

### Boltzmann distribution

GS distribution (property)

- . **Boltzmann distribution**

RT atmospheric density

atmospheric diffusion

kinetic theory

statistical mechanics

two fluid models

### Boltzmann transport equation

RT BBGKY hierarchy

BGK model

Burnett equations

Chapman-Enskog theory

$\infty$  equations

- Fokker-Planck equation
- hydrodynamic equations
- kinetic theory
- particle diffusion
- statistical mechanics
- transport properties
- transport theory

### Boltzmann-Vlasov equation

RT  $\infty$  equations

- high temperature plasmas
- Maxwell equation
- partial differential equations
- wave equations

### Bolza problems

RT optimization

$\infty$  problems

### BOMARC A missile

GS missiles

- . antiaircraft missiles
- . . BOMARC missiles
- . . . **BOMARC A missile**
- . . . surface to air missiles
- . . . BOMARC missiles
- . . . . **BOMARC A missile**

RT liquid propellant rocket engines

solid propellant rocket engines

### BOMARC B missile

GS missiles

- . antiaircraft missiles
- . . BOMARC missiles
- . . . **BOMARC B missile**
- . . . surface to air missiles
- . . . BOMARC missiles
- . . . . **BOMARC B missile**

RT liquid propellant rocket engines

solid propellant rocket engines

### BOMARC missiles

GS missiles

- . antiaircraft missiles
- . . **BOMARC missiles**
- . . . BOMARC A missile
- . . . . BOMARC B missile
- . . . surface to air missiles
- . . . **BOMARC missiles**

- . . . BOMARC A missile
- . . . BOMARC B missile
- bomb calorimeters**
  - GS measuring instruments
  - . calorimeters
  - . . **bomb calorimeters**
  - RT drop calorimeters
  - flame calorimeters
  - heat measurement
  - high temperature tests
  - temperature measuring instruments
- ∞ **bombardment**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT electron bombardment
  - hypervelocity projectiles
  - irradiation
  - meteoritic damage
  - sputtering
- bomber aircraft**
  - GS attack aircraft
  - . **bomber aircraft**
  - . . A-2 aircraft
  - . . A-3 aircraft
  - . . A-4 aircraft
  - . . A-5 aircraft
  - . . A-6 aircraft
  - . . B-1 aircraft
  - . . B-2 aircraft
  - . . B-26 aircraft
  - . . B-47 aircraft
  - . . B-50 aircraft
  - . . B-52 aircraft
  - . . B-57 aircraft
  - . . B-58 aircraft
  - . . B-66 aircraft
  - . . B-70 aircraft
  - . . F-111 aircraft
  - . . Shackleton bomber
  - . . Valiant aircraft
  - . . Victor MK-1 aircraft
  - . . Vulcan aircraft
  - RT ∞ aircraft
  - antisubmarine warfare aircraft
  - bombing equipment
  - F-117A aircraft
  - jet aircraft
  - ∞ military aircraft
  - ∞ military aviation
  - tanker aircraft
  - training aircraft
  - Vampire MK 35 aircraft
- bombing equipment**
  - GS onboard equipment
  - . aircraft equipment
  - . . **bombing equipment**
  - RT B-1 aircraft
  - bomber aircraft
  - bombs (ordnance)
  - ∞ equipment
  - fire control
- ∞ **bombs**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT bombs (ordnance)
  - precision guided projectiles
  - pressure gages
  - samplers
- bombs (ordnance)**
  - DEF Explosive devices designed to be detonated under specified conditions.
  - GS explosive devices
  - . **bombs (ordnance)**
  - RT ammunition
  - B-1 aircraft
  - bombing equipment
  - ∞ bombs
  - explosives
  - incendiary ammunition
  - missiles
  - nuclear weapons
  - projectiles
  - pyrotechnics
- shaped charges
- torpedoes
- warheads
- bombs (pressure gages)**
  - USE **pressure gages**
- bombs (samplers)**
  - USE **samplers**
- Bonanza aircraft**
  - USE **C-35 aircraft**
- bond graphs**
  - GS charts
  - . graphs (charts)
  - . . **bond graphs**
  - RT control systems design
  - differential equations
  - dynamic models
  - mathematical models
  - ∞ mathematics
  - simulation
  - systems analysis
  - systems engineering
- Bond number**
  - (added December 1999)
  - DEF Dimensionless number representing the ratio between gravitational force and the surface tension of a bubble, drop, or meniscus.
  - GS dimensionless numbers
  - . **Bond number**
  - RT drops (liquids)
  - gravitational effects
  - interfacial tension
  - menisci
- bonded joints**
  - (added March 1993)
  - UF **bondlines**
  - GS joints (junctions)
  - . **bonded joints**
  - RT adhesive bonding
  - bonding
  - rocket engine cases
  - rocket linings
  - scarf joints
  - soldered joints
  - solid propellant rocket engines
  - welded joints
- bonding**
  - DEF Specifically, a system of connections between all metal parts of an aircraft or other structure forming a continuous electrical unit and preventing jumping or arching of static electricity. Glueing or cementing together for structural strength.
  - GS **bonding**
  - . adhesive bonding
  - . agglutination
  - . ceramic bonding
  - . explosive welding
  - . inertia bonding
  - . metal bonding
  - . . metal-metal bonding
  - . reaction bonding
  - . resin bonding
  - RT adhesion
  - adhesion tests
  - beam leads
  - binding
  - bonded joints
  - cementation
  - chemical bonds
  - cohesion
  - cold welding
  - debonding (materials)
  - diffusion welding
  - ∞ joining
  - joints (junctions)
  - laminates
  - laser welding
  - sealing
  - soldering
  - superplastic forming
- welding
- bondlines**
  - USE **bonded joints**
- Bondoc meteorite**
  - GS celestial bodies
  - . meteorites
  - . . stony meteorites
  - . . . achondrites
  - . . . . **Bondoc meteorite**
- bone demineralization**
  - GS demineralizing
  - . **bone demineralization** diseases
  - . **bone demineralization**
  - RT biological effects
  - ∞ biology
  - bones
  - hindlimb suspension
  - osteoblasts
  - osteocalcin
  - osteogenesis
  - osteoporosis
  - physiological effects
  - physiology
  - weightlessness
- bone density**
  - (added August 2004)
  - USE **bone mineral content**
- bone formation**
  - (added January 2005)
  - USE **osteogenesis**
- bone marrow**
  - GS tissues (biology)
  - . connective tissue
  - . . **bone marrow**
  - RT bones
  - cancer
  - erythrocytes
  - hematopoiesis
  - hematopoietic system
  - leukemias
  - leukocytes
  - lymphatic system
  - monocytes
  - osteogenesis
- bone mineral content**
  - UF **BMC**
  - bone density**
  - GS content
  - . **bone mineral content**
  - RT bioengineering
  - ∞ biology
  - biometrics
  - bones
  - calcium carbonates
  - calcium phosphates
  - collagens
  - minerals
  - osteoblasts
  - osteocalcin
  - osteogenesis
  - osteoporosis
- bones**
  - GS anatomy
  - . musculoskeletal system
  - . . **bones**
  - . . . femur
  - . . . pelvis
  - . . . scapula
  - . . . skull
  - . . . . cranium
  - . . . . . intracranial cavity
  - . . . . . mastoids
  - . . . spine
  - . . . vertebrae
  - . . . sternum
  - . . . tibia
  - . . . ulna
  - RT arthritis
  - bone demineralization
  - bone marrow
  - bone mineral content

## Bonne projection

calcification  
cartilage  
chin  
connective tissue  
exoskeletons  
joints (anatomy)  
lamella  
osteoblasts  
osteocalcin  
osteogenesis  
osteoporosis  
spinal cord  
splints

### Bonne projection

DEF A type of conical map projection in which meridians are plotted as curves and the parallels are spaced along them at true distances.

RT mapping  
maps  
∞ projection

### Boolean algebra

DEF The study of the manipulation of symbols representing operations according to the rules of logic. Boolean algebra corresponds to an algebra using only the numbers 0 and 1, therefore can be used in programming digital computers which operate on the binary principle.

GS mathematical logic  
. lattices (mathematics)  
. . **Boolean algebra**  
. . . Boolean functions  
RT algebra  
∞ conjunction  
instruction sets (computers)  
∞ logic  
set theory  
switching theory  
transistor logic  
∞ unions

### Boolean functions

GS functions (mathematics)  
. **Boolean functions**  
mathematical logic  
. lattices (mathematics)  
. . Boolean algebra  
. . . **Boolean functions**

### ∞ boom

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT booms (equipment)  
sonic booms  
tail assemblies

### booms (equipment)

GS positioning devices (machinery)  
. **booms (equipment)**  
RT ∞ boom  
cranes

### boost

USE **acceleration (physics)**

### booster recovery

RT expendable stages (spacecraft)  
recoverable launch vehicles  
∞ recovery  
recovery parachutes  
spacecraft recovery

### booster rocket engines

UF *rocket boosters*  
GS engines  
. rocket engines  
. . **booster rocket engines**  
. . . AJ-10 engine  
. . . Algol engine  
. . . apogee boost motors  
. . . H-1 engine  
. . . LR-87-AJ-5 engine  
. . . M-1 engine  
. . . M-55 engine  
. . . MA-2 engine  
. . . MA-3 engine  
. . . MA-5 engine

. . . Nike booster rocket engines  
. . . P-1 engine  
. . . rocket engine 9KS-11000  
. . . Space Shuttle Boosters  
. . . . Advanced Solid Rocket Motor (STS)

. . . X-405 engine  
RT air breathing boosters  
Ares 1 first stage  
Ares 5 cargo launch vehicle  
Blue Goose missile

∞ boosters  
burnout  
Delta 4 Heavy launch vehicle  
ducted rocket engines  
expendable stages (spacecraft)  
F-1 rocket engine  
hybrid propellant rocket engines  
internal combustion engines  
launch vehicles  
liftoff (launching)  
liquid propellant rocket engines  
Mace missiles  
nuclear engine for rocket vehicles  
nuclear rocket engines  
oxygen-hydrocarbon rocket engines  
recoverable spacecraft  
solid propellant rocket engines  
spinning solid upper stage  
stage separation  
sustainer rocket engines  
turbo-rocket engines  
TX-354 engine

### ∞ booster rockets

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT launch vehicles

### ∞ boosters

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air breathing boosters  
amplifiers  
apogee boost motors  
booster rocket engines  
boosters (explosives)  
launch vehicles  
Scout project  
Space Shuttle Boosters  
Titan project

### boosters (explosives)

GS explosive devices  
. initiators (explosives)  
. . **boosters (explosives)**  
igniters  
. initiators (explosives)  
. . **boosters (explosives)**  
RT ∞ boosters  
exploding wires

### boostglide vehicles

DEF Vehicles designed to glide in the atmosphere following a rocket-powered phase. Portions of the flights may be ballistic, out of the atmosphere.

GS gliders  
. **boostglide vehicles**  
. . X-20 aircraft  
reentry vehicles  
. **boostglide vehicles**  
. . X-20 aircraft  
RT aerospace planes  
∞ aircraft  
Astro vehicle  
gliding  
hypersonic aircraft  
hypersonic gliders  
lifting reentry vehicles  
manned spacecraft  
recoverable spacecraft  
rocket planes  
∞ vehicles

### boots (footwear)

GS clothing  
. **boots (footwear)**

RT shoes

### Boral

GS composite materials  
. **Boral**  
composite structures  
. laminates  
. . **Boral**  
RT aluminum  
boron carbides  
radiation shielding

### boranes

GS boron compounds  
. boron hydrides  
. . **boranes**  
. . . carborane  
. . . hydrazine borane  
. . . pentaboranes  
hydrogen compounds  
. hydrides  
. . boron hydrides  
. . . **boranes**  
. . . . carborane  
. . . . hydrazine borane  
. . . . pentaboranes  
RT borohydrides

### borates

GS boron compounds  
. **borates**  
. . lithium borates  
RT boric acids  
∞ oxygen compounds

### Borazon (trademark)

USE **boron nitrides**

### borders

RT boundaries  
margins  
rims

### Bordoni peaks

RT elastic deformation  
plastic deformation  
resonant frequencies  
stress relaxation

### boredom

RT detachment  
human behavior  
human reactions  
lethargy  
monotony  
psychological effects  
psychology  
space flight stress

### boreholes

DEF Holes made by drilling into the ground to study stratification, to search for or to obtain natural resources, or to release underground pressures.

RT cavities  
clays  
drilling  
excavation  
exploration  
geology  
gravels  
∞ holes  
minerals  
pits (excavations)  
rocks  
shales  
soils

### Borel sets

GS analysis (mathematics)  
. real variables  
. . measure and integration  
. . . **Borel sets**  
mathematical logic  
. set theory  
. . **Borel sets**

- RT probability theory
- bores*  
USE **cavities**
- borescopes*  
USE **endoscopes**
- boresight error**  
DEF Linear displacement between two parallel lines of sight.  
GS errors  
. position errors  
. . **boresight error**  
RT air navigation  
boresights  
directional antennas  
displacement  
displacement measurement  
error analysis  
instrument errors  
line of sight communication  
navigation instruments  
optical tracking  
range errors
- boresights**  
RT boresight error  
directional antennas  
optical tracking
- boric acids**  
GS acids  
. **boric acids**  
boron compounds  
. **boric acids**  
RT borates
- borides**  
GS boron compounds  
. **borides**  
. . chromium borides  
. . titanium borides  
RT intermetallics
- boring machines**  
GS tools  
. machine tools  
. . **boring machines**  
RT drills  
∞ machinery
- Born approximation**  
UF *Born-Mayer equation*  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **Born approximation**  
RT ∞ equations  
quantum mechanics  
scattering cross sections
- Born-Infeld theory**  
RT electrodynamics  
electrostatics  
Maxwell equation  
nonlinear equations  
∞ theories
- Born-Mayer equation*  
USE **Born approximation**
- Born-Oppenheimer approximation**  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **Born-Oppenheimer approximation**  
RT Franck-Condon principle
- borohydrides**  
GS boron compounds  
. **borohydrides**  
. . aluminum borohydrides  
. . beryllium borohydrides  
hydrogen compounds  
. hydrides  
. . **borohydrides**  
. . . aluminum borohydrides  
. . . beryllium borohydrides  
RT boranes
- boron hydrides
- boron**  
GS chemical elements  
. metalloids  
. . **boron**  
. . . boron isotopes  
. . . . boron 10  
RT boron reinforced materials  
Borsic (tradename)
- boron 10**  
GS chemical elements  
. metalloids  
. . boron  
. . . boron isotopes  
. . . . **boron 10**  
. . . . nuclides  
. . . . isotopes  
. . . . boron isotopes  
. . . . **boron 10**
- boron alloys**  
GS alloys  
. **boron alloys**  
RT metalloids
- boron carbides**  
GS boron compounds  
. **boron carbides**  
carbon compounds  
. carbides  
. . **boron carbides**  
RT Boral  
ceramic fibers
- boron chlorides**  
GS boron compounds  
. **boron chlorides**  
halogen compounds  
. chlorine compounds  
. . chlorides  
. . . **boron chlorides**  
. . . halides  
. . . chlorides  
. . . **boron chlorides**
- boron compounds**  
GS **boron compounds**  
. borates  
. . lithium borates  
. boric acids  
. borides  
. . chromium borides  
. . titanium borides  
. borohydrides  
. . aluminum borohydrides  
. . beryllium borohydrides  
. boron carbides  
. boron chlorides  
. boron fluorides  
. boron hydrides  
. . aluminum borohydrides  
. . beryllium borohydrides  
. . boranes  
. . . carborane  
. . . hydrazine borane  
. . . pentaboranes  
. boron nitrides  
. boron oxides  
. boron phosphides  
. diborane  
. organic boron compounds  
. tourmaline  
RT ∞ chemical compounds  
∞ Group 3A compounds  
high energy fuels  
metal fuels  
metal propellants
- boron fibers**  
DEF Fibers produced by vapor deposition methods; used in various composite materials to impart a balance of strength and stiffness.  
GS fibers  
. reinforcing fibers  
. . **boron fibers**  
RT aluminum boron composites  
Borsic (tradename)  
carbon fibers
- composite materials  
fiber composites  
fiber orientation  
fiber strength  
∞ filaments  
glass fibers  
metal matrix composites  
polymer matrix composites  
reinforced plastics
- boron fluorides**  
UF *boron trifluoride*  
GS boron compounds  
. **boron fluorides**  
halogen compounds  
. fluorine compounds  
. . fluorides  
. . . **boron fluorides**  
. . . halides  
. . . fluorides  
. . . **boron fluorides**
- boron hydrides**  
GS boron compounds  
. **boron hydrides**  
. . aluminum borohydrides  
. . beryllium borohydrides  
. . boranes  
. . . carborane  
. . . hydrazine borane  
. . . pentaboranes  
hydrogen compounds  
. hydrides  
. . **boron hydrides**  
. . . aluminum borohydrides  
. . . beryllium borohydrides  
. . . boranes  
. . . . carborane  
. . . . hydrazine borane  
. . . . pentaboranes  
RT borohydrides
- boron isotopes**  
GS chemical elements  
. metalloids  
. . boron  
. . . **boron isotopes**  
. . . . boron 10  
. . . . nuclides  
. . . . isotopes  
. . . . **boron isotopes**  
. . . . boron 10
- boron nitrides**  
UF *Borazon (trademark)*  
GS boron compounds  
. **boron nitrides**  
nitrogen compounds  
. nitrides  
. . **boron nitrides**  
RT carbon nitrides
- boron oxides**  
GS boron compounds  
. **boron oxides**  
chalcogenides  
. oxides  
. . **boron oxides**
- boron phosphides**  
GS boron compounds  
. **boron phosphides**  
phosphorus compounds  
. phosphides  
. . **boron phosphides**
- boron reinforced materials**  
GS composite materials  
. **boron reinforced materials**  
. . aluminum boron composites  
. . boron-epoxy composites  
RT boron  
ceramic matrix composites  
epoxy resins  
fiber composites  
fibers  
∞ materials  
plastics  
reinforced plastics

## boron-epoxy composites

reinforcing fibers

*boron trifluoride*

USE **boron fluorides**

### boron-epoxy composites

- GS composite materials
  - . boron reinforced materials
  - . . **boron-epoxy composites**
  - . . polymer matrix composites
  - . . epoxy matrix composites
  - . . . **boron-epoxy composites**
  - . . resin matrix composites
  - . . **boron-epoxy composites**
- RT aircraft structures
  - ∞ chemical compounds
  - composite structures
  - epoxy resins
  - fiber composites
  - laminates
  - plastic aircraft structures
  - spacecraft components
  - superhybrid materials

### borosilicate glass

- DEF Low expansion heat resistant glass.
- Used for Pyrex (trademark).
- UF *Pyrex (trademark)*
- GS glass
  - . **borosilicate glass**
- RT glassware
  - honeycomb mirrors
  - silicon dioxide

### Borsic (tradename)

- DEF Trademark of United Aircraft Products, Inc. for its boron aluminum composite materials.
- GS composite materials
  - . metal matrix composites
  - . . **Borsic (tradename)**
- RT aluminum
  - boron
  - boron fibers
  - fiber composites
  - ∞ materials
  - metal fibers
  - metals

### Bose geometry

- GS geometry
  - . **Bose geometry**
- RT equations of state

*Bose-Chaudhuri-Hocquenghem codes*

USE **BCH codes**

### Bose-Einstein condensates

- (added February 1996)
- GS condensates
  - . **Bose-Einstein condensates**
- RT atom optics
  - bosons
  - condensed matter physics
  - ideal gas
  - relativistic effects
  - superfluidity

*Bose-Einstein statistics*

USE **quantum statistics**

*Bosnia*

(added June 1996)

USE **Bosnia and Herzegovina**

### Bosnia and Herzegovina

- (added June 1996)
- UF *Bosnia*
  - Herzegovina*
- GS nations
  - . **Bosnia and Herzegovina**
- RT Croatia
  - Europe
  - Serbska Republic
  - Yugoslavia

### boson fields

- RT field theory (physics)
- ∞ fields

mesons

### bosons

- GS particles
  - . elementary particles
  - . . **bosons**
  - . . . alpha particles
  - . . . Higgs bosons
  - . . . mesons
  - . . . . eta-mesons
  - . . . . hyperons
  - . . . . . xi hyperons
  - . . . . kaons
  - . . . . meson resonance
  - . . . . . X mesons
  - . . . . muons
  - . . . . omega-mesons
  - . . . . pions
  - . . . . vector mesons
  - . . . . . rho-mesons
  - . . . . . sigma-mesons
  - . . . photons
  - . . . xi hyperons
  - . nuclear particles
  - . . **bosons**
  - . . . alpha particles
  - . . . Higgs bosons
  - . . . mesons
  - . . . . eta-mesons
  - . . . . hyperons
  - . . . . . xi hyperons
  - . . . . kaons
  - . . . . meson resonance
  - . . . . . X mesons
  - . . . . muons
  - . . . . omega-mesons
  - . . . . pions
  - . . . . vector mesons
  - . . . . . rho-mesons
  - . . . . . sigma-mesons
  - . . . photons
  - . . . xi hyperons
- RT Bose-Einstein condensates
  - charged particles
  - Fermi-Dirac statistics
  - quantum statistics
  - standard model (particle physics)
  - string theory
  - supersymmetry

### botany

- GS **botany**
  - . geobotany
- RT agriculture
  - alfalfa
  - barley
  - biogeochemistry
  - ∞ biology
  - blight
  - brown wave effect
  - brush (botany)
  - chaparral
  - citrus trees
  - corn
  - farm crops
  - fruits
  - genetically modified plants
  - green wave effect
  - habitats
  - hay
  - leguminous plants
  - oats
  - plants (botany)
  - ∞ science
  - silviculture
  - sugar beets
  - sugar cane
  - tomatoes
  - vegetation growth
  - vineyards
  - ∞ zoology

### Botswana

- GS nations
  - . **Botswana**
- RT Africa
  - Republic of South Africa

### bottles

- RT ∞ containers

flasks  
glassware  
tanks (containers)

### Bouguer law

- DEF A relationship describing the rate of decrease of flux density of a plane-parallel beam of monochromatic radiation as it penetrates a medium which both scatters and absorbs at that wavelength. Used for Lambert law.
- UF *Lambert law*
- RT absorptivity
  - Beer law
  - electromagnetic absorption
  - thermoplasticity

### boules

- GS crystals
  - . **boules**
- RT single crystals

### boundaries

- UF *peripheries*
- GS **boundaries**
  - . core-mantle boundary
  - . fluid boundaries
  - . . gas-solid interfaces
  - . . jet boundaries
  - . . liquid-liquid interfaces
  - . . liquid-solid interfaces
  - . . liquid-vapor interfaces
  - . antiphase boundaries
  - . free boundaries
  - . grain boundaries
- RT airspace
  - borders
  - boundary conditions
  - circumferences
  - contour sensors
  - delineation
  - fences (barriers)
  - interfaces
  - regions

### boundary conditions

- (added July 1990)
- GS conditions
  - . **boundary conditions**
  - . . perfectly matched layers
- RT boundaries
  - boundary element method
  - boundary layers
  - boundary value problems
  - computational aeroacoustics
  - Trefftz method
  - vortex lattice method

*boundary detection (imagery)*

USE **edge detection**

### boundary element method

- DEF Technique for solving two- and three-dimensional boundary value problems in thermodynamics, mechanics, etc.
- GS analysis (mathematics)
  - . numerical analysis
  - . . approximation
  - . . . **boundary element method**
  - . . . . Trefftz method
- RT boundary conditions
  - computational mechanics
  - stress analysis

### boundary integral method

- DEF Technique related to the boundary element method, and used for laminar and turbulent flow problems.
- GS analysis (mathematics)
  - . numerical analysis
  - . . **boundary integral method**
  - . . . procedures
  - . . . **boundary integral method**
- RT boundary value problems
  - ∞ methodology

### boundary layer combustion

- GS combustion
  - . **boundary layer combustion**
- RT boundary layers
  - combustible flow

convective heat transfer  
diffusion flames  
flame propagation  
laminar boundary layer  
reacting flow

**boundary layer control**

UF *laminar flow control*  
GS **boundary layer control**  
. porous boundary layer control  
RT aerodynamics  
airfoil fences  
∞ bleeding  
blowing  
boundary layers  
buffeting  
circulation control airfoils  
∞ control  
control surfaces  
drag devices  
fluid amplifiers  
flutter  
jet control  
leading edge slats  
lift augmentation  
lift devices  
riblets  
spoilers  
tangential blowing  
turbulence  
upper surface blown flaps  
vacuum  
vortex generators  
wing slots  
X-21 aircraft

**boundary layer equations**

GS flow equations  
. **boundary layer equations**  
. . Blasius equation  
RT boundary layers  
differential equations  
∞ equations  
flow theory  
Reynolds averaging

**boundary layer flow**

GS fluid flow  
. viscous flow  
. . **boundary layer flow**  
. . . reattached flow  
. . . secondary flow  
. . . separated flow  
. . . boundary layer separation  
RT air currents  
atmospheric boundary layer  
backward facing steps  
Blasius equation  
boundary layer thickness  
convective heat transfer  
flow distribution  
forward facing steps  
Lighthill gas model  
Magnus effect  
recirculative fluid flow  
Reynolds number  
stagnation flow  
stagnation point  
Tollmien-Schlichting waves  
wall flow

*boundary layer noise*

USE **aerodynamic noise**  
**boundary layers**

**boundary layer plasmas**

DEF Plasmas resulting from the frictional heat of hypersonic spacecraft entering the Earth's atmosphere.  
GS particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)  
. . . **boundary layer plasmas**  
. corpuscular radiation  
. . energetic particles  
. . . plasmas (physics)  
. . . **boundary layer plasmas**  
RT aerodynamic heating  
aerothermodynamics

boundary layers  
hypersonic reentry  
plasma physics  
plasma sheaths

**boundary layer separation**

UF *breakaway*  
*flow separation*  
*laminar boundary layer separation*  
GS fluid flow  
. viscous flow  
. . boundary layer flow  
. . . separated flow  
. . . **boundary layer separation**  
RT aerodynamic stalling  
airspeed  
angle of attack  
boundary layers  
Crocco-Lee theory  
∞ diffusers  
Falkner-Skan equation  
flow distribution  
injection  
Kutta-Joukowski condition  
lift drag ratio  
reattached flow  
recirculative fluid flow  
reversed flow  
rotating stalls  
∞ separation  
stagnation flow  
∞ stalling  
sweep angle  
vortex generators  
zero lift

**boundary layer stability**

GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . flow stability  
. . . . **boundary layer stability**  
. flow characteristics  
. . flow stability  
. . . **boundary layer stability**  
stability  
. dynamic stability  
. . motion stability  
. . . flow stability  
. . . . **boundary layer stability**  
RT aerodynamic stability  
backwash  
boundary layers  
Goertler instability  
Reynolds number

**boundary layer thickness**

(added September 1995)  
SN (LIMITED TO FLUID DYNAMICS, DO NOT USE FOR PLANETARY OR CORE MANTLE BOUNDARIES)  
GS thickness  
. **boundary layer thickness**  
RT boundary layer flow  
flow distribution  
pressure gradients  
surface layers  
transition flow

**boundary layer transition**

RT air currents  
boundary layers  
Ekman layer  
Goertler instability  
Knudsen flow  
laminar boundary layer  
laminar flow  
molecular flow  
Reynolds number  
three dimensional boundary layer  
Tollmien-Schlichting waves  
∞ transition  
transition flow  
∞ transition layers  
transition points  
turbulence  
turbulent boundary layer

turbulent flow

**boundary layers**

UF *boundary layer noise*  
GS **boundary layers**  
. atmospheric boundary layer  
. compressible boundary layer  
. hypersonic boundary layer  
. incompressible boundary layer  
. laminar boundary layer  
. planetary boundary layer  
. supersonic boundary layers  
. thermal boundary layer  
. three dimensional boundary layer  
. turbulent boundary layer  
. two dimensional boundary layer  
RT asthenosphere  
boundary conditions  
boundary layer combustion  
boundary layer control  
boundary layer equations  
boundary layer plasmas  
boundary layer separation  
boundary layer stability  
boundary layer transition  
core-mantle boundary  
Crocco method  
∞ draft  
drag  
fluid boundaries  
fluid flow  
gas-solid interfaces  
∞ layers  
liquid-liquid interfaces  
liquid-solid interfaces  
mixing layers (fluids)  
panel method (fluid dynamics)  
shear layers  
surface layers  
wall pressure

**boundary lubrication**

GS lubrication  
. **boundary lubrication**  
RT bearings  
lubricants  
squeeze films  
vapor phase lubrication  
wear resistance

**boundary value problems**

DEF Physical problems completely specified by a differential equation in an unknown, valid in a certain region of space, and certain information (boundary condition) about the unknown, given on the boundaries of that region. The information required to determine the solution depends completely and uniquely on the particular problem. Used for initial value problems and point matching method (mathematics).

UF *initial value problems*  
*point matching method (mathematics)*  
GS **boundary value problems**  
. Cauchy problem  
. Dirichlet problem  
. Neumann problem  
RT Bessel functions  
boundary conditions  
boundary integral method  
counter rotation  
Crank-Nicholson method  
differential equations  
finite element method  
finite volume method  
half planes  
half spaces  
Hankel functions  
ill-posed problems (mathematics)  
Lame functions  
Mathieu function  
minimal surfaces  
Monge-Ampere equation  
observability (systems)  
∞ problems  
Sobolev space  
three dimensional bodies  
Trefftz method

**Bourdon tubes**

GS transducers



## Boussinesq approximation

- . pressure sensors
- . . **Bourdon tubes**
- RT pressure gages
- pressure measurement
- ∞ tubes

### Boussinesq approximation

DEF The assumption (frequently used in the theory of convection) that the fluid is incompressible except insofar as the thermal expansion produces a buoyancy.

- RT convection
- heat transfer
- incompressible fluids
- perturbation theory
- thermal expansion

*bow shock waves*

USE **shock waves**

### bow waves

DEF Shock waves in front of a body, such as an airfoil, or apparently attached to the forward tip of the body.

- RT hypersonic wakes
- Mach cones
- magnetosheath
- shock waves
- surface waves

### ∞ bows

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

- RT bending
- camber
- forebodies
- heaving

### box beams

GS structural members

. beams (supports)

. . **box beams**

- RT ∞ boxes
- cantilever beams
- girders
- rectangular beams

### ∞ boxes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

- RT box beams
- boxes (containers)

### boxes (containers)

- RT ∞ boxes
- ∞ buckets
- cases (containers)
- ∞ containers
- packages

*BPSK*

USE **binary phase shift keying**

### brackets

- RT anchors (fasteners)
- fasteners
- fixtures
- holders
- mounting

### bradycardia

- GS rates (per time)
- . heart rate
- . . **bradycardia**
- signs and symptoms
- . **bradycardia**
- RT heart diseases

### Bragg angle

DEF The angle between the incident beam and the lattice planes considered.

- GS geometry
- . Euclidean geometry
- . . angles (geometry)
- . . . **Bragg angle**
- RT Bragg gratings
- Bragg reflectors
- crystallography
- DBR lasers
- diffraction

- diffraction paths
- electron diffraction
- isotropy
- ∞ orientation
- ∞ physical properties
- radiography

### Bragg cells

(added September 1988)

- GS modulators
- . **Bragg cells**
- RT acousto-optics
- amplitude modulation
- crystal optics
- light beams
- light modulation
- phase demodulators
- phase modulation
- ultrasonic light modulation

### Bragg curve

DEF A curve showing the average specific ionization of an ionizing particle of a particular kind as a function of its kinetic energy, velocity, or residual range.

- RT biological effects
- nuclear reactions
- particle interactions
- radiation effects

### Bragg gratings

(added August 1997)

- GS gratings (spectra)
- . **Bragg gratings**
- RT apodization
- Bragg angle
- Bragg reflectors
- interferometers
- optical fibers
- optical filters

*Bragg mirrors*

(added August 1997)

USE **Bragg reflectors**

### Bragg reflectors

(added August 1997)

- UF *Bragg mirrors*
- GS reflectors
- . **Bragg reflectors**
- RT Bragg angle
- Bragg gratings
- DBR lasers
- gallium arsenides
- mirrors
- semiconductor lasers

### braided composites

(added November 1992)

- GS composite materials
- . fiber composites
- . . **braided composites**
- RT carbon fiber reinforced plastics
- epoxy matrix composites
- graphite-epoxy composites
- reinforcing fibers
- three dimensional composites
- woven composites

### braille

DEF A system of writing that uses characters made up of raised dots. It was named after Louis Braille.

- RT blindness
- embossing

### brain

- GS anatomy
- . nervous system
- . . central nervous system
- . . . **brain**
- . . . . brain stem
- . . . . cerebellum
- . . . . cerebral ventricles
- . . . . cerebrum
- . . . . cerebral cortex
- . . . . occipital lobes
- . . . . diencephalon
- . . . . hypothalamus
- . . . . pineal gland

- . . . . . thalamus
- . . . . hippocampus
- RT angiography
- brain circulation
- brain damage
- cerebrospinal fluid
- echoencephalography
- electroencephalography
- encephalitis
- head (anatomy)
- information processing (biology)
- intracranial pressure
- neuroglia
- neurology
- pituitary gland
- psychiatry
- psychology
- rheoencephalography
- spinal cord

### brain circulation

- GS circulation
- . blood circulation
- . . **brain circulation**
- RT brain
- rheoencephalography

### brain damage

- UF *brain injuries*
- GS injuries
- . **brain damage**
- RT brain

*brain injuries*

(added August 2004)

USE **brain damage**

### brain stem

- GS anatomy
- . nervous system
- . . central nervous system
- . . . brain
- . . . . **brain stem**

### ∞ brakes

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT brakes (for arresting motion)
- brakes (forming or bending)

### brakes (for arresting motion)

- UF *decelerators*
- dragulators*
- GS **brakes (for arresting motion)**
- . aerodynamic brakes
- . . ballutes
- . . drag chutes
- . . split flaps
- . . wing flaps
- . . . leading edge flaps
- . . . leading edge slats
- . . . trailing edge flaps
- . . . vortex flaps
- . aircraft brakes
- . . split flaps
- . . wing flaps
- . . . leading edge flaps
- . . . leading edge slats
- . . . trailing edge flaps
- . . . vortex flaps
- . wheel brakes
- RT abort apparatus
- antiskid devices
- ∞ arresters
- arresting gear
- ∞ brakes
- braking
- cylindrical chambers
- drag devices
- flaps (control surfaces)
- landing gear
- nose wheels
- parachutes
- retarders (devices)
- thrust reversal
- towed bodies
- vehicle wheels

- wheels
- brakes (forming or bending)**  
RT ∞ brakes  
metal working
- braking**  
RT brakes (for arresting motion)  
deceleration  
eddy currents  
retarders (devices)  
retarding  
thrust reversal
- branching (mathematics)**  
DEF The appearance of a new solution of a mathematical equation at some critical value of a parameter, as a result of which there may be more than one solution (different branches) of the equation. Used for bifurcation (mathematics)  
UF *bifurcation (mathematics)*  
GS **branching (mathematics)**  
. period doubling  
RT chaos  
functions (mathematics)  
∞ logic  
mathematical logic  
set theory  
switching theory
- branching (physics)**  
RT bifurcation (biology)  
∞ physics
- brasses**  
GS alloys  
. copper alloys  
. . **brasses**
- Bravais crystals**  
GS crystals  
. **Bravais crystals**  
RT crystal growth  
crystal lattices  
crystal structure  
packing density  
single crystals
- Brayton cycle**  
DEF A thermodynamic cycle consisting of two constant-pressure processes interspersed with two constant-entropy cycles. Named after George B. Brayton, American engineer.  
GS cycles  
. thermodynamic cycles  
. . **Brayton cycle**  
RT gas turbine engines  
gas turbines  
Rankine cycle  
solar dynamic power systems
- Brazil**  
GS nations  
. **Brazil**  
RT Amazon region (South America)  
Brazilian space program  
South America
- Brazilian space program**  
DEF The space program of Brazil which is under the jurisdiction of the Instituto de Pesquisas Espaciais (INPE).  
GS programs  
. space programs  
. . **Brazilian space program**  
RT Brazil
- brazing**  
GS welding  
. fusion welding  
. . gas welding  
. . . **brazing**  
. . . low temperature brazing  
RT fluxes  
∞ joining  
metal bonding  
sealing  
soldering
- ultrasonic soldering
- Brazzaville*  
USE **Congo (Brazzaville)**
- breadboard models**  
DEF Assemblies of preliminary circuits or parts used to prove the feasibility of a device, circuit, system, or principle without regard to the final configuration or packaging of the parts.  
GS models  
. **breadboard models**  
RT circuits  
printed circuits  
product development  
prototypes
- breakaway*  
USE **boundary layer separation**
- ∞ **breakdown**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT TERMS LISTED BELOW)  
RT classifications  
electrical faults  
failure  
gaps  
metal working  
system failures
- breakers (electric)*  
USE **circuit breakers**
- breaking**  
RT destruction  
fragmentation  
∞ separation
- breakup (spacecraft)*  
USE **spacecraft breakup**
- breakwaters**  
DEF Offshore structures (such as moles, walls, or jetties) that by breaking the force of waves, protect harbors, anchorages, beaches, or shore areas. Used for jetties and sea walls.  
UF *jetties*  
*sea walls*  
RT concrete structures  
harbors  
littoral drift  
littoral transport  
oceanography  
structural design  
∞ structures  
underwater engineering  
underwater structures  
water waves  
∞ waves
- breast**  
(added August 2004)  
DEF In humans, one of the paired regions in the anterior portion of the thorax.  
GS anatomy  
. chest  
. . **breast**  
. . . mammary glands  
RT cancer  
thorax
- ∞ **breathing**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT argon-oxygen atmospheres  
breathing apparatus  
breathing vibration  
emergency breathing techniques  
expiration  
helium-oxygen atmospheres  
high altitude breathing  
hypercapnia  
hyperpnea  
oxygen breathing  
respiration  
respiratory reflexes
- breathing apparatus**  
GS **breathing apparatus**  
. oxygen masks  
. underwater breathing apparatus
- RT ∞ breathing  
∞ equipment  
fire fighting  
life support systems  
oxygen supply equipment  
portable life support systems  
respirators
- breathing vibration**  
GS vibration  
. structural vibration  
. . **breathing vibration**  
RT bending vibration  
∞ breathing  
exhausting  
missile vibration  
venting
- breccia**  
GS rocks  
. **breccia**  
RT ataxite  
igneous rocks  
regolith  
sedimentary rocks  
soils
- breeder reactors**  
GS nuclear reactors  
. **breeder reactors**  
. . Experimental Breeder Reactor 1  
. . Experimental Breeder Reactor 2  
. . light water breeder reactors  
. . liquid metal fast breeder reactors  
RT Enrico Fermi atomic power plant  
nuclear power reactors
- breeding (reproduction)**  
RT fertility  
genetics  
heredity  
reproduction (biology)
- Breguet 940 aircraft**  
GS Breguet aircraft  
. **Breguet 940 aircraft**  
monoplanes  
. **Breguet 940 aircraft**  
research vehicles  
. research aircraft  
. . **Breguet 940 aircraft**  
V/STOL aircraft  
. short takeoff aircraft  
. . **Breguet 940 aircraft**  
RT ∞ aircraft
- Breguet 941 aircraft**  
GS Breguet aircraft  
. **Breguet 941 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **Breguet 941 aircraft**  
monoplanes  
. **Breguet 941 aircraft**  
passenger aircraft  
. **Breguet 941 aircraft**  
transport aircraft  
. cargo aircraft  
. . **Breguet 941 aircraft**  
V/STOL aircraft  
. short takeoff aircraft  
. . **Breguet 941 aircraft**  
RT ∞ aircraft
- Breguet 1150 aircraft**  
UF *Atlantic aircraft*  
GS antisubmarine warfare aircraft  
. **Breguet 1150 aircraft**  
attack aircraft  
. **Breguet 1150 aircraft**  
Breguet aircraft  
. **Breguet 1150 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **Breguet 1150 aircraft**  
monoplanes  
. **Breguet 1150 aircraft**  
reconnaissance aircraft  
. **Breguet 1150 aircraft**

## Breguet aircraft

RT ∞ aircraft

### Breguet aircraft

GS **Breguet aircraft**  
. Breguet 940 aircraft  
. Breguet 941 aircraft  
. Breguet 1150 aircraft  
RT ∞ aircraft  
Jaguar aircraft

### bremsstrahlung

DEF Electromagnetic radiation produced by the rapid change in the velocity of an electron or another fast, charged particle as it approaches an atomic nucleus and is deflected by it. In German it means braking radiation.

GS electromagnetic radiation  
. **bremsstrahlung**  
RT Cerenkov radiation  
diffraction radiation  
electron photon cascades  
electron radiation  
far ultraviolet radiation  
gamma ray bursts  
gamma rays  
nuclear radiation  
relativistic plasmas  
synchrotron radiation  
x rays

### Brewster angle

GS geometry  
. Euclidean geometry  
. . . angles (geometry)  
. . . **Brewster angle**  
RT polarization characteristics  
reflection  
refractivity

### bricks

DEF Solid masonry units of clay or shale, usually formed into a rectangular prism while plastic and burned or fired in a kiln. Bricks are ceramic products.

GS masonry  
. **bricks**  
RT cements  
ceramics  
clays  
∞ construction materials  
mortars (material)

### ∞ bridges

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT bridges (landforms)  
bridges (structures)  
electric bridges  
liquid bridges

### bridges (landforms)

GS landforms  
. **bridges (landforms)**  
RT ∞ bridges  
geology  
∞ ridges

### bridges (structures)

RT ∞ bridges  
construction  
construction industry  
crossings  
crossovers  
highways  
ramps (structures)  
∞ structures  
towers

### Bridgman method

RT crystal growth  
∞ methodology  
single crystals

### brightness

DEF The attribute of visual perception in accordance with which an area appears to emit more or less light.

GS electromagnetic properties  
. optical properties  
. . . **brightness**

. . . sky brightness  
RT bistatic reflectivity  
brightness distribution  
color  
dimming  
emissivity  
flux (rate)  
glare  
human factors engineering  
illuminance  
illuminating  
incandescence  
∞ intensity  
light (visible radiation)  
limb brightening  
luminance  
luminescence  
luminosity  
luminous intensity  
luster  
radiance  
radiant flux density  
reflectance  
stellar luminosity  
visibility  
vision

### brightness discrimination

GS discrimination  
. sensory discrimination  
. . . **brightness discrimination**  
RT ∞ illumination  
visual perception

### brightness distribution

DEF The statistical distribution based on brightness, or the distribution of brightness over the surface of an object.

GS distribution (property)  
. **brightness distribution**  
electromagnetic properties  
. optical properties  
. . . **brightness distribution**  
statistical distributions  
. **brightness distribution**  
RT astrophysics  
black body radiation  
brightness  
brightness temperature  
∞ distribution  
galactic radiation  
photography  
radiant flux density  
radio astronomy  
solar granulation  
stellar luminosity

### brightness temperature

DEF In astrophysics, the temperature of a black body radiating the same amount of energy per unit area at the wavelengths under consideration as the observed body. The temperature of a nonblack body determined by measurement with an optical pyrometer.

GS temperature  
. **brightness temperature**  
RT astrophysics  
black body radiation  
brightness distribution  
limb brightening  
meteorology  
photography  
radio astronomy  
temperature measurement

### Brillouin effect

RT ∞ effects  
frequency shift  
light scattering  
monochromatic radiation

### Brillouin flow

GS electric current  
. **Brillouin flow**  
RT beam currents  
electron beams  
electron optics  
∞ flow

traveling wave tubes

### Brillouin zones

GS regions  
. **Brillouin zones**  
RT band structure of solids  
conduction bands  
crystal lattices  
Fermi surfaces  
free electrons

### Brillouin-Wigner equation

RT ∞ equations

### brines

DEF Water saturated or strongly impregnated with common salt.  
RT coolants  
refrigerants  
salinity  
salt baths  
salt beds  
sea water

### Brinkman number

(added July 2001)

DEF A dimensionless number expressing the ratio of viscous heating to convective heat transfer rates through the flow boundary.

GS dimensionless numbers  
. **Brinkman number**  
ratios  
. **Brinkman number**  
RT channel flow  
convective heat transfer  
Couette flow  
Nusselt number  
viscous flow  
wall temperature

### briquets

RT blanks  
pellets  
tablets

### Bristol-Siddeley BS 53 engine

UF *Pegasus engine*  
GS engines  
. air breathing engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **Bristol-Siddeley BS 53 engine**  
. internal combustion engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **Bristol-Siddeley BS 53 engine**  
. turbine engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **Bristol-Siddeley BS 53 engine**  
RT P-1127 aircraft

### Bristol-Siddeley Olympus 593 engine

GS engines  
. air breathing engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . . turbojet engines  
. . . . . **Bristol-Siddeley Olympus 593 engine**  
. internal combustion engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . . turbojet engines  
. . . . . **Bristol-Siddeley Olympus 593 engine**  
. turbine engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . . turbojet engines

- . . . . **Bristol-Siddeley Olympus 593 engine**
- Bristol-Siddeley Viper engine**
  - GS engines
    - . air breathing engines
    - . gas turbine engines
    - . jet engines
      - . . . turbojet engines
        - . . . . **Bristol-Siddeley Viper engine**
    - . internal combustion engines
      - . gas turbine engines
        - . jet engines
          - . . . turbojet engines
            - . . . . **Bristol-Siddeley Viper engine**
      - . turbine engines
        - . gas turbine engines
          - . jet engines
            - . . . turbojet engines
              - . . . . **Bristol-Siddeley Viper engine**
- British Aircraft Corp aircraft*
  - USE **BAC aircraft**
- British Columbia**
  - GS nations
    - . Canada
      - . . **British Columbia**
- British Guinea*
  - USE **Guyana**
- British Honduras*
  - USE **Belize**
- brittle materials**
  - RT cleavage
    - cracking (fracturing)
    - embrittlement
    - fracture strength
    - granular materials
    - hardness
    - impact strength
  - ∞ materials
    - porous materials
- brittle-ductile transition*
  - USE **ductile-brittle transition**
- brittleness**
  - GS mechanical properties
    - . **brittleness**
  - RT Charpy impact test
    - cleavage
    - cold hardening
    - crack closure
    - crack initiation
    - crack propagation
    - cracking (fracturing)
    - ductile-brittle transition
    - ductility
    - embrittlement
    - fractography
    - fracture strength
    - fracturing
    - hardness
    - impact strength
    - impact tests
    - notch strength
    - notch tests
    - toughness
    - weldability
- broadband**
  - UF *wideband*
  - GS bandwidth
    - . **broadband**
  - frequencies
    - . **broadband**
  - RT asynchronous transfer mode
    - ∞ bands
      - frequency response
      - log periodic antennas
      - narrowband
      - spiral antennas
- broadband amplifiers**
  - GS amplifiers
    - . **broadband amplifiers**
  - RT bandwidth
- frequencies
  - wideband communication
- broadcasting**
  - UF *radio broadcasting*
  - GS telecommunication
    - . **broadcasting**
  - RT communication networks
    - direct broadcast satellites
    - radio communication
    - radio equipment
    - radio signals
    - radio transmission
    - Symphonie satellites
    - transmission
    - Voice of America
- broken symmetry**
  - DEF Phenomena where a loss of symmetry is present such as in piezoelectricity. Used for symmetry breaking.
  - UF *symmetry breaking*
  - GS symmetry
    - . **broken symmetry**
    - . . CP violation
  - RT grand unified theory
    - Higgs bosons
    - mathematical models
    - supergravity
    - supersymmetry
    - theoretical physics
- bromates**
  - GS halogen compounds
    - . bromine compounds
      - . . **bromates**
  - RT ∞ oxygen compounds
- bromides**
  - GS halogen compounds
    - . bromine compounds
      - . . **bromides**
      - . . . ammonium bromides
      - . . . cesium bromides
      - . . . chromium bromides
      - . . . dibromides
      - . . . hydrobromic acid
      - . . . hydrobromides
      - . . . magnesium bromides
      - . . . potassium bromides
      - . . . silver bromides
      - . . . sodium bromides
      - . . . strontium bromides
      - . . . halides
        - . . **bromides**
        - . . . ammonium bromides
        - . . . cesium bromides
        - . . . chromium bromides
        - . . . dibromides
        - . . . hydrobromic acid
        - . . . hydrobromides
        - . . . magnesium bromides
        - . . . potassium bromides
        - . . . silver bromides
        - . . . sodium bromides
        - . . . strontium bromides
  - RT salt beds
- bromination**
  - GS chemical reactions
    - . halogenation
      - . . **bromination**
- bromine**
  - GS chemical elements
    - . halogens
      - . . **bromine**
    - . . . bromine isotopes
  - bromine 82*
    - USE **bromine isotopes**
  - bromine 87*
    - USE **bromine isotopes**
  - bromine compounds**
    - GS halogen compounds
      - . **bromine compounds**
      - . . bromates
      - . . bromides
  - . . . ammonium bromides
  - . . . cesium bromides
  - . . . chromium bromides
  - . . . dibromides
  - . . . hydrobromic acid
  - . . . hydrobromides
  - . . . magnesium bromides
  - . . . potassium bromides
  - . . . silver bromides
  - . . . sodium bromides
  - . . . strontium bromides
  - . . . halon
  - RT ∞ chemical compounds
    - halocarbons
    - polybrominated biphenyls
  - bromine isotopes**
    - UF *bromine 82*
      - bromine 87*
    - GS chemical elements
      - . halogens
        - . . bromine
          - . . . **bromine isotopes**
        - . . nuclides
          - . . . isotopes
            - . . . **bromine isotopes**
    - bronchi**
      - UF *bronchial tubes*
      - GS anatomy
        - . respiratory system
          - . . **bronchi**
      - RT lungs
        - trachea
          - ∞ tubes
    - bronchial tubes*
      - USE **bronchi**
    - bronzes**
      - GS alloys
        - . copper alloys
          - . . **bronzes**
    - Brorsen-Metcalf comet**
      - (added May 1991)*
      - GS celestial bodies
        - . comets
          - . . **Brorsen-Metcalf comet**
      - RT solar system
    - broths**
      - RT ∞ food
        - nutrition
    - brown dwarf stars**
      - (added March 1989)*
      - GS celestial bodies
        - . stars
          - . . **brown dwarf stars**
      - RT companion stars
        - cool stars
        - dwarf stars
        - massive compact halo objects
        - protostars
        - stellar evolution
    - brown wave effect**
      - RT annual variations
        - botany
        - chlorophylls
          - ∞ effects
            - foliage
            - leaves
    - Brownian movements**
      - RT colloids
        - dispersions
        - Einstein equations
        - emulsions
        - Fokker-Planck equation
        - ∞ motion
        - ∞ suspensions
    - Bruceton test*
      - USE **statistical tests**
    - brucite**
      - GS chalcogenides
        - . oxides
          - . . **brucite**

## Bruderheim meteorite

- magnesium compounds
  - . **brucite**
  - minerals
  - . **brucite**
- Bruderheim meteorite**
  - GS celestial bodies
  - . meteorites
  - . . stony meteorites
  - . . . chondrites
  - . . . . **Bruderheim meteorite**
- Brunei**
  - GS nations
  - . **Brunei**
  - RT Asia
- Brunt-Vaisala frequency**
  - DEF The frequency at which an air parcel will oscillate when subjected to an infinitesimal perturbation in a stably stratified atmosphere.
  - GS constraints
  - . meteorological parameters
  - . . **Brunt-Vaisala frequency**
  - frequencies
  - . **Brunt-Vaisala frequency**
  - RT air currents
  - air flow
  - air masses
  - atmospheric circulation
  - atmospheric physics
  - atmospheric stratification
  - oscillations
- brush (botany)**
  - UF *scrubs (botany)*
  - GS plants (botany)
  - . **brush (botany)**
  - . . chaparral
  - RT botany
  - defoliation
  - Earth resources
  - guayule
  - herbicides
- brush seals**
  - (added July 1991)
  - GS seals (stoppers)
  - . **brush seals**
  - RT leakage
- brushes**
  - GS **brushes**
  - . brushes (electrical contacts)
  - RT electric contacts
  - electric generators
  - electric motors
- brushes (electrical contacts)**
  - DEF Conductive metal or carbon blocks used to make sliding electrical contact with a moving part as in an electric motor.
  - GS brushes
  - . **brushes (electrical contacts)**
  - RT electric contacts
  - electric generators
  - electric motors
- Bryophytes**
  - UF *liverworts*
  - mosses*
  - GS plants (botany)
  - . **Bryophytes**
- BSCCO superconductors**
  - (added March 1993)
  - UF *Bi-Sr-Ca-Cu-O superconductors*
  - GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . mixed oxides
  - . . . . **BSCCO superconductors**
  - conductors
  - . superconductors (materials)
  - . . high temperature superconductors
  - . . . **BSCCO superconductors**
  - RT bismuth oxides
  - calcium oxides
  - copper oxides
  - cuprates
- strontium oxides
  - superconducting films
- BSX**
  - GS explosives
  - . **BSX**
  - RT nitromethane
- bubble chambers**
  - DEF Devices used for the detection and study of elementary particles and nuclear reactions. Charged particles from an accelerator are introduced into a superheated liquid, each forming a trail of bubbles along its path.
  - GS ionization chambers
  - . **bubble chambers**
  - RT ∞ chambers
  - cloud chambers
  - elementary particles
  - particle trajectories
  - radiation counters
  - spark chambers
- bubble memory devices**
  - GS computer components
  - . computer storage devices
  - . . **bubble memory devices**
  - magnetic storage
  - . **bubble memory devices**
  - RT binary data
  - core storage
  - data processing
  - data recorders
  - data recording
  - data storage
  - magnetic cores
  - magnetic domains
  - magnetic recording
  - magnetic switching
- bubble technique**
  - GS technologies
  - . **bubble technique**
  - RT data recorders
  - electronic equipment
  - flight instruments
  - ∞ instruments
  - magnetic domains
  - onboard equipment
  - recording instruments
  - semiconductor devices
  - solid state devices
  - spacecraft instruments
- bubbles**
  - DEF Internal voids or trapped globules of air or other gas.
  - RT aeration
  - cavitation flow
  - Coanda effect
  - effervescence
  - foams
  - metal foams
  - thermocapillary migration
  - wakes
- Buccaneer aircraft**
  - UF *B-103 aircraft*
  - Blackburn B-103 aircraft*
  - GS attack aircraft
  - . **Buccaneer aircraft**
  - Hawker Siddeley aircraft
  - . **Buccaneer aircraft**
  - jet aircraft
  - . **Buccaneer aircraft**
  - monoplanes
  - . **Buccaneer aircraft**
  - RT ∞ aircraft
  - Harrier aircraft
- bucket brigade devices**
  - GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . charge transfer devices
  - . . . . **bucket brigade devices**
  - RT charge coupled devices
- semiconductors (materials)
- ∞ **buckets**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT boxes (containers)
  - ∞ capsules
  - drums (containers)
  - trays
  - turbomachine blades
- bucketeye aircraft*
- USE **T-2 aircraft**
- buckling**
  - DEF An unstable state of equilibrium of a thin-walled body stemming from compressive stresses in walls. The lateral deflection of a thin-walled body resulting from such instability.
  - GS **buckling**
  - . creep buckling
  - . elastic buckling
  - . Euler buckling
  - . thermal buckling
  - RT bending
  - collapse
  - compression loads
  - deformation
  - distortion
  - Donnell equations
  - failure
  - failure modes
  - flange wrinkling
  - heaving
  - kink bands
  - kinking
  - ∞ ridges
  - shell stability
  - stresses
  - structural failure
  - structural strain
  - temperature inversions
  - torsion
  - twisting
  - warpage
  - wrinkling
- buckminsterfullerene**
  - (added August 1991)
  - DEF A form of solid carbon consisting of a somewhat disordered hexagonal close packing of soccer-ball-shaped C60 molecules. The molecules are extremely hard pseudospherical molecules bonded by weak Van der Waals forces.
  - GS fullerenes
  - . **buckminsterfullerene**
  - RT carbon
  - graphite
  - molecules
  - polyatomic molecules
  - polyhedrons
- budgeting**
  - RT accounting
  - allocations
  - appropriations
  - ∞ budgets
  - cost analysis
  - cost effectiveness
  - cost estimates
  - economic factors
  - estimating
  - financial management
  - forecasting
  - grants
  - income
  - mission planning
  - planning
  - procurement management
  - project planning
  - revenue
- ∞ **budgets**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT budgeting
  - Earth radiation budget
  - energy budgets
  - engineering management

federal budgets  
foreign policy  
heat budget  
procurement management  
research management

*Buffalo aircraft*

USE **DHC 5 aircraft**

#### buffer storage

DEF In computer operations, storage used to compensate for a difference in rate of flow or time of occurrence when transferring information from one device to another.

GS computer components  
. computer storage devices  
. . **buffer storage**

RT ∞ buffers  
core storage  
data storage  
∞ storage

#### ∞ buffers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT buffer storage  
buffers (chemistry)

#### buffers (chemistry)

RT bases (chemical)  
∞ buffers  
chemical equilibrium  
neutralizers  
pH

#### buffeting

DEF The beating of an aerodynamic structure or surfaces by unsteady flow, gusts, etc.; the irregular shaking or oscillation of a vehicle component owing to turbulent air or separated flow.

RT aerodynamic stability  
aircraft stability  
boundary layer control  
compressibility effects  
flight characteristics  
flutter  
oscillating flow  
shaking  
spacecraft motion  
spacecraft stability  
Strouhal number  
turbulence effects  
vortex avoidance

*building materials*

USE **construction materials**

*building structures*

USE **buildings**

#### buildings

DEF Structures erected and framed of component structural members designed for the housing, shelter or support of persons, animals, or property. Used for building structures.

UF *building structures*  
RT architecture  
basements  
ceilings (architecture)  
chimneys  
construction  
construction industry  
floors  
greenhouses  
hangars  
indoor air pollution  
inflatable structures  
missile silos  
museums  
roofs  
shelters  
solar houses  
stairways  
Starsite program  
walls

#### bulbs

RT luminaires  
plant roots

pressure vessels  
syringes

#### Bulgaria

GS nations  
. **Bulgaria**  
RT Black Sea  
Europe

#### bulging

GS metal working  
. **bulging**  
RT deep drawing  
dimpling  
explosive forming  
forging  
hot working  
magnetic forming  
metal drawing  
stretch forming

#### bulk acoustic wave devices

DEF Acoustooptic devices utilizing bulk sound waves at megahertz frequencies in thin film transducers. Used for B-A-W devices.

UF *B-A-W devices*  
RT ∞ devices  
surface acoustic wave devices  
transducers

#### bulk modulus

DEF The reciprocal of the coefficient of compressibility.

GS mechanical properties  
. **bulk modulus**  
RT compressibility  
density (mass/volume)

#### bulkheads

DEF Steep or vertical structures supporting natural or artificial embankments.

GS walls  
. **bulkheads**  
RT ∞ barriers  
end plates  
hulls (structures)  
partitions (structures)  
reinforcement (structures)  
thick walls  
thin walls

#### Bullpup missiles

GS missiles  
. air to surface missiles  
. . **Bullpup missiles**  
RT LR-62-RM-2 engine

#### Bumblebee project

GS missiles  
. **Bumblebee project**  
programs  
. projects  
. . **Bumblebee project**  
RT Talos missile  
tartar missile  
terrier missile  
Typhon weapon system

#### bumpers

RT cushions  
meteoroid protection  
meteoroids  
protectors

#### bumpy toruses

DEF The shapes (doughnuts) of certain plasmas.

RT fusion reactors  
plasma control  
plasma heating  
tokamak devices  
toroidal plasmas

#### Buna (trademark)

GS elastomers  
. rubber  
. . synthetic rubbers  
. . . **Buna (trademark)**  
RT butadiene

styrenes

#### bunching

GS **bunching**  
. electron bunching  
RT queueing theory  
space charge  
velocity modulation

#### bundle drawing

RT ∞ drawing  
metal drawing

#### bundles

RT ∞ containers  
packages  
umbilical connectors  
wiring

#### bunkers (fuel)

GS tanks (containers)  
. **bunkers (fuel)**  
RT fuel systems

#### buoyancy

RT acoustic levitation  
aerostatics  
ballast (mass)  
buoyancy-driven flow  
density (mass/volume)  
floating  
gas density  
levitation  
mechanical properties  
neutral buoyancy simulation  
∞ physical properties  
porosity  
Rayleigh number  
voids

#### buoyancy-driven flow

(added June 2002)

DEF Convective fluid flow induced by buoyant forces.

GS fluid flow  
. convective flow  
. . **buoyancy-driven flow**  
RT buoyancy  
convection  
crystal growth  
Rayleigh-Benard convection

#### buoys

RT beacons  
compasses  
floats  
∞ markers  
navigation aids  
ocean data acquisitions systems

#### Buran space shuttle

(added August 1989)

GS manned spacecraft  
. space shuttles  
. . **Buran space shuttle**  
reentry vehicles  
. recoverable spacecraft  
. . reusable spacecraft  
. . . space shuttles  
. . . . **Buran space shuttle**  
soft landing spacecraft  
. **Buran space shuttle**  
Soviet spacecraft  
. **Buran space shuttle**  
RT aerospace planes  
U.S.S.R. space program

#### bureaus (organizations)

GS institutions  
. **bureaus (organizations)**  
organizations  
. federations  
. . **bureaus (organizations)**  
RT programs  
projects  
teams  
university program

#### burettes

GS measuring instruments

## Burger equation

- . **burettes**
- RT glassware
- pipettes
- ∞ tubes
- Burger equation**
- GS analysis (mathematics)
- . real variables
- . . differential equations
- . . . partial differential equations
- . . . . **Burger equation**
- RT continuum mechanics
- ∞ equations
- Navier-Stokes equation
- shock wave propagation
- Burkina**
- UF *Upper Volta*
- GS nations
- . **Burkina**
- RT Africa
- Burma**
- GS nations
- . **Burma**
- RT Asia
- burners**
- RT afterburning
- chemical reactors
- combustion chambers
- diffusion welding
- fuel injection
- furnaces
- incinerators
- waste energy utilization
- Burnett equations**
- (added March 1996)
- SN (These equations are frequently associated with models of hypersonic flow and shock waves.)
- GS equations of motion
- . kinetic equations
- . . hydrodynamic equations
- . . . **Burnett equations**
- flow equations
- . **Burnett equations**
- RT Boltzmann transport equation
- Chapman-Enskog theory
- computational fluid dynamics
- hypersonic flow
- shock waves
- burn-in**
- RT failure
- failure analysis
- integrated circuits
- quality control
- burning*
- USE **combustion**
- burning process*
- USE **combustion**
- burning rate**
- DEF The velocity at which a solid propellant in a rocket is consumed. The symbol is  $r$ .
- GS rates (per time)
- . **burning rate**
- RT burnout
- combustion
- combustion control
- combustion efficiency
- combustion stability
- explosives
- flame propagation
- flammability
- fuel consumption
- fuel-air ratio
- fuels
- pressure dependence
- propellant consumption
- propellant grains
- propellants
- smoldering
- solid propellant combustion
- solid propellant rocket engines
- solid rocket propellants
- velocity coupling
- burning time**
- UF *firing time*
- GS time
- . **burning time**
- RT combustion
- combustion efficiency
- firing (igniting)
- flight optimization
- flight time
- rocket engines
- rocket firing
- testing time
- thrust
- windows (intervals)
- burnout**
- SN (LIMITED TO TERMINATION OF COMBUSTION IN A ROCKET ENGINE BECAUSE OF EXHAUSTION OF THE PROPELLANT)
- DEF The termination of combustion in a rocket engine because of exhaustion of the propellant.
- RT booster rocket engines
- burning rate
- combustion
- ∞ cut-off
- erosive burning
- extinguishing
- solid propellant rocket engines
- thrust termination
- burns (injuries)**
- GS injuries
- . **burns (injuries)**
- RT crash injuries
- fires
- laser damage
- lesions
- radiation injuries
- burnthrough (failure)**
- GS failure
- . **burnthrough (failure)**
- RT ablation
- damage
- melting
- perforating
- burst tests**
- GS destructive tests
- . **burst tests**
- RT containment
- failure analysis
- fracture mechanics
- fracture strength
- ∞ materials tests
- pressure vessels
- bursts**
- GS **bursts**
- . gamma ray bursts
- . . radio bursts
- . . . solar radio bursts
- . . . . type 2 bursts
- . . . . type 3 bursts
- . . . . type 4 bursts
- . . . . type 5 bursts
- RT ∞ disturbances
- emission
- explosions
- fragmentation
- implosions
- rupturing
- bursts (communication)*
- (added December 1996)
- USE **packets (communication)**
- Burundi**
- UF *Ruanda-Urundi*
- GS nations
- . **Burundi**
- RT Africa
- Rwanda
- bus conductors**
- GS conductors
- . **bus conductors**
- RT electric wire
- flat conductors
- power lines
- ∞ power transmission
- bushings**
- RT bearings
- inserts
- linings
- shafts (machine elements)
- spacers
- business management*
- USE **industrial management**
- butadiene**
- UF *vinyl ethylene*
- GS organic compounds
- . hydrocarbons
- . . aliphatic hydrocarbons
- . . . dienes
- . . . . **butadiene**
- RT Buna (trademark)
- hydrocarbon fuels
- polybutadiene
- butanedinitrile*
- (added April 2004)
- USE **succinonitrile**
- butanes**
- UF *isobutane*
- GS organic compounds
- . hydrocarbons
- . . aliphatic hydrocarbons
- . . . alkanes
- . . . . **butanes**
- RT petroleum products
- butenes**
- UF *butylene*
- isobutylene*
- GS organic compounds
- . hydrocarbons
- . . aliphatic hydrocarbons
- . . . alkenes
- . . . . **butenes**
- butt joints**
- GS joints (junctions)
- . **butt joints**
- RT lap joints
- metal joints
- riveted joints
- soldered joints
- welded joints
- butterfly valves**
- GS valves
- . **butterfly valves**
- . . dampers (valves)
- buttes**
- GS landforms
- . terraces (landforms)
- . . plateaus
- . . . mesas
- . . . . **buttes**
- ∞ **buttons**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT manual control
- butylene*
- USE **butenes**
- butylene oxides*
- USE **tetrahydrofuran**
- butyric acid**
- GS acids
- . **butyric acid**
- RT fermentation
- BWB configurations*
- (added April 2001)
- USE **blended-wing-body configurations**
- bypass ratio**
- DEF Ratio of the secondary to the primary

inlet airflows for a turbofan engine.

GS ratios  
. **bypass ratio**

RT air intakes  
engine inlets  
flow geometry  
hypersonic inlets  
inlet airframe configurations  
inlet flow

inlet nozzles  
intake systems  
nose inlets  
side inlets  
supersonic inlets

**bypasses**

UF *shunts*  
RT diverters

relief valves

**by-products**

RT materials recovery  
products  
reaction products  
wastes



# C

## C (programming language)

(added July 1988)

- GS languages
  - . programming languages
  - . . high level languages
  - . . . **C (programming language)**
- RT C++ (programming language)
  - compilers
  - computer programming
  - expert systems

## C band

- SN (3.9 TO 6.2 GHZ)
- GS frequencies
  - . radio frequencies
  - . . microwave frequencies
  - . . . **C band**
- RT millimeter waves
  - superhigh frequencies

## C stars

- USE **carbon stars**

## C-1A aircraft

- UF *Trader aircraft*
- GS Grumman aircraft
  - . **C-1A aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-1A aircraft**
- RT ∞ aircraft
  - ∞ military aircraft

## C-2 aircraft

- UF *COD aircraft*
- GS Grumman aircraft
  - . **C-2 aircraft**
  - jet aircraft
  - . turboprop aircraft
  - . . **C-2 aircraft**
  - monoplanes
  - . **C-2 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-2 aircraft**
- RT ∞ aircraft

## C-5 aircraft

- UF *Galaxy aircraft*
- GS *Lockheed C-5 aircraft*
  - jet aircraft
  - . **C-5 aircraft**
  - Lockheed aircraft
  - . **C-5 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-5 aircraft**
- RT ∞ aircraft
  - turbofan engines

## C-8A augmentor wing aircraft

- DEF NASA's research, short haul, jet aircraft.
- GS jet aircraft
  - . **C-8A augmentor wing aircraft**
  - research vehicles
  - . research aircraft
  - . . **C-8A augmentor wing aircraft**
  - transport aircraft
  - . short haul aircraft
  - . . **C-8A augmentor wing aircraft**
  - V/STOL aircraft
  - . short takeoff aircraft
  - . . **C-8A augmentor wing aircraft**
- RT ∞ aircraft

## C-9 aircraft

- GS jet aircraft
  - . **C-9 aircraft**
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **C-9 aircraft**
  - McDonnell aircraft
  - . . **C-9 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-9 aircraft**
- RT ∞ aircraft

evacuating (transportation)

## C-15 aircraft

- UF *YC-15 aircraft*
- GS transport aircraft
  - . cargo aircraft
  - . . **C-15 aircraft**
  - V/STOL aircraft
  - . short takeoff aircraft
  - . . **C-15 aircraft**
- RT ∞ aircraft

## C-17 aircraft

- (added August 1995)
- GS McDonnell Douglas aircraft
  - . **C-17 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-17 aircraft**
- RT ∞ aircraft
  - turbofan engines

## C-33 aircraft

- UF *Beech C-33 aircraft*
- GS *Debonair aircraft*
  - Beechcraft aircraft
  - . Beech 99 aircraft
  - . . **C-33 aircraft**
  - general aviation aircraft
  - . **C-33 aircraft**
  - light aircraft
  - . Beech 99 aircraft
  - . . **C-33 aircraft**
  - monoplanes
  - . **C-33 aircraft**
  - passenger aircraft
  - . **C-33 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-33 aircraft**
- RT ∞ aircraft

## C-35 aircraft

- UF *Beech S-35 aircraft*
- GS *Bonanza aircraft*
  - Beechcraft aircraft
  - . Beech 99 aircraft
  - . . **C-35 aircraft**
  - general aviation aircraft
  - . **C-35 aircraft**
  - light aircraft
  - . Beech 99 aircraft
  - . . **C-35 aircraft**
  - monoplanes
  - . **C-35 aircraft**
  - passenger aircraft
  - . **C-35 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-35 aircraft**
- RT ∞ aircraft

## C-46 aircraft

- UF *Commando aircraft*
- GS *Curtiss C-46 aircraft*
  - Curtiss-Wright aircraft
  - . **C-46 aircraft**
  - monoplanes
  - . **C-46 aircraft**
  - passenger aircraft
  - . **C-46 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-46 aircraft**
- RT ∞ aircraft

## C-47 aircraft

- UF *Dakota aircraft*
- GS McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **C-47 aircraft**
  - monoplanes
  - . **C-47 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-47 aircraft**

RT ∞ aircraft

## C-54 aircraft

- UF *R5D aircraft*
- GS *Skymaster aircraft*
  - McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **C-54 aircraft**
  - monoplanes
  - . **C-54 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-54 aircraft**
- RT ∞ aircraft

## C-118 aircraft

- GS McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **C-118 aircraft**
  - monoplanes
  - . **C-118 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-118 aircraft**
- RT ∞ aircraft

## C-119 aircraft

- GS Fairchild-Hiller aircraft
  - . **C-119 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-119 aircraft**
- RT ∞ aircraft

## C-121 aircraft

- UF *EC-121 aircraft*
- GS *Lockheed Constellation aircraft*
  - R7V aircraft*
  - Warning Star aircraft*
  - Lockheed aircraft
  - . **C-121 aircraft**
  - monoplanes
  - . **C-121 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-121 aircraft**
- RT ∞ aircraft
  - passenger aircraft

## C-123 aircraft

- UF *Provider aircraft*
- GS *YC-123 aircraft*
  - Fairchild-Hiller aircraft
  - . **C-123 aircraft**
  - monoplanes
  - . **C-123 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-123 aircraft**
  - V/STOL aircraft
  - . short takeoff aircraft
  - . . **C-123 aircraft**
- RT ∞ aircraft

## C-124 aircraft

- GS McDonnell Douglas aircraft
  - . Douglas aircraft
  - . . **C-124 aircraft**
  - monoplanes
  - . **C-124 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . **C-124 aircraft**
- RT ∞ aircraft

## C-130 aircraft

- UF *GC-130 aircraft*
- GS *Hercules aircraft*
  - JC-130 aircraft*
  - KC-130 aircraft*
  - NC-130 aircraft*
  - jet aircraft
  - . turboprop aircraft
  - . . **C-130 aircraft**
  - Lockheed aircraft
  - . **C-130 aircraft**
  - monoplanes
  - . **C-130 aircraft**
  - transport aircraft

. cargo aircraft  
 . . **C-130 aircraft**  
 RT ∞ aircraft  
 T-56 engine

**C-131 aircraft**  
 UF *Samaritan aircraft*  
 GS General Dynamics aircraft  
 . **C-131 aircraft**  
 monoplanes  
 . **C-131 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-131 aircraft**  
 RT ∞ aircraft

**C-133 aircraft**  
 UF *Cargomaster aircraft*  
 GS jet aircraft  
 . turboprop aircraft  
 . . **C-133 aircraft**  
 McDonnell Douglas aircraft  
 . Douglas aircraft  
 . . **C-133 aircraft**  
 monoplanes  
 . **C-133 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-133 aircraft**  
 RT ∞ aircraft  
 T-34 engine

**C-135 aircraft**  
 UF *EC-135 aircraft*  
*KC-135 aircraft*  
*Stratotanker aircraft*  
 GS Boeing aircraft  
 . **C-135 aircraft**  
 jet aircraft  
 . **C-135 aircraft**  
 monoplanes  
 . **C-135 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-135 aircraft**  
 RT Advanced Range Instrumentation  
 Aircraft  
 ∞ aircraft  
 turbofan aircraft

**C-140 aircraft**  
 UF *Jet Star aircraft*  
 GS jet aircraft  
 . **C-140 aircraft**  
 Lockheed aircraft  
 . **C-140 aircraft**  
 monoplanes  
 . **C-140 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-140 aircraft**  
 RT ∞ aircraft

**C-141 aircraft**  
 UF *Starlifter aircraft*  
 GS jet aircraft  
 . turbofan aircraft  
 . . **C-141 aircraft**  
 Lockheed aircraft  
 . **C-141 aircraft**  
 monoplanes  
 . **C-141 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-141 aircraft**  
 RT ∞ aircraft  
 Kupper Airborne Observatory  
 turbofan engines

*C-142 aircraft*  
 USE **XC-142 aircraft**

**C-160 aircraft**  
 UF *Transall C-160 aircraft*  
 GS Hamburger aircraft  
 . **C-160 aircraft**  
 jet aircraft  
 . turboprop aircraft  
 . . **C-160 aircraft**  
 monoplanes

. **C-160 aircraft**  
 Nord aircraft  
 . **C-160 aircraft**  
 transport aircraft  
 . cargo aircraft  
 . . **C-160 aircraft**  
 RT ∞ aircraft  
 turboprop engines

**C++ (programming language)**  
*(added October 1991)*  
 GS languages  
 . programming languages  
 . . high level languages  
 . . . **C++ (programming language)**  
 RT C (programming language)  
 Java (programming language)  
 object-oriented programming

**cabin atmospheres**  
 GS controlled atmospheres  
 . **cabin atmospheres**  
 . . spacecraft cabin atmospheres  
 RT aircraft compartments  
 ∞ atmospheres  
 cockpits  
 environmental control  
 oxygen supply equipment  
 pressurized cabins  
 space capsules

∞ **cabins**  
 SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)  
 RT aircraft compartments  
 cockpits  
 pressurized cabins  
 spacecraft cabins

**cable force recorders**  
 GS recording instruments  
 . **cable force recorders**  
 RT ∞ recorders  
 strain gages  
 tensiometers

**cable television**  
*(added December 1990)*  
 UF *CATV*  
 GS television systems  
 . **cable television**  
 RT closed circuit television  
 communication cables  
 television transmission

∞ **cables**  
 SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)  
 RT cables (ropes)  
 coaxial cables  
 communication cables  
 power lines  
 submarine cables  
 tetherlines  
 transmission lines

**cables (ropes)**  
 RT ∞ belts  
 ∞ cables  
 chains  
 cordage  
 fasteners  
 reels  
 strands  
 towing  
 wire

*CAD (design)*  
 USE **computer aided design**

**cadastral mapping**

DEF Large-scale mapping for showing the boundaries of subdivisions of land, usually with the directions and lengths thereof and the areas of individual tracts, compiled for the purpose of describing and recording ownership. The map may also show culture, drainage, and other features related to the use of the land.

GS mapping  
 . **cadastral mapping**

RT geography  
 maps  
 thematic mapping

**cadmium**

GS chemical elements  
 . **cadmium**  
 . . cadmium isotopes  
 metals  
 . transition metals  
 . . **cadmium**  
 . . . cadmium isotopes  
 RT heavy metals

*cadmium 114*

USE **cadmium isotopes**

**cadmium alloys**

GS alloys  
 . **cadmium alloys**  
 RT bearing alloys

**cadmium antimonides**

GS antimony compounds  
 . antimonides  
 . . **cadmium antimonides**  
 cadmium compounds  
 . **cadmium antimonides**

**cadmium chlorides**

GS cadmium compounds  
 . **cadmium chlorides**  
 halogen compounds  
 . chlorine compounds  
 . . chlorides  
 . . . **cadmium chlorides**  
 . halides  
 . . chlorides  
 . . . **cadmium chlorides**  
 . . metal halides  
 . . . **cadmium chlorides**

**cadmium compounds**

GS **cadmium compounds**  
 . cadmium antimonides  
 . cadmium chlorides  
 . cadmium fluorides  
 . cadmium selenides  
 . cadmium sulfides  
 . cadmium tellurides  
 RT ∞ chemical compounds  
 ∞ Group 2B compounds  
 ∞ metal compounds

**cadmium fluorides**

GS cadmium compounds  
 . **cadmium fluorides**  
 halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . metal fluorides  
 . . . . **cadmium fluorides**  
 . halides  
 . . fluorides  
 . . . metal fluorides  
 . . . . **cadmium fluorides**  
 . . metal halides  
 . . . metal fluorides  
 . . . . **cadmium fluorides**

**cadmium isotopes**

UF *cadmium 114*  
 GS chemical elements  
 . cadmium  
 . . **cadmium isotopes**  
 . nuclides  
 . . isotopes  
 . . . **cadmium isotopes**  
 metals  
 . transition metals  
 . . cadmium  
 . . . **cadmium isotopes**

*cadmium mercury tellurides*

USE **mercury cadmium tellurides**

*cadmium nickel batteries*

USE **nickel cadmium batteries**

**cadmium selenides**

GS cadmium compounds

## cadmium sulfides

- . . **cadmium selenides**
- chalcogenides
- . selenides
- . . **cadmium selenides**
- selenium compounds
- . selenides
- . . **cadmium selenides**

*cadmium silver batteries*  
USE **silver cadmium batteries**

**cadmium sulfides**  
GS cadmium compounds

- . **cadmium sulfides**
- chalcogenides
- . sulfides
- . . inorganic sulfides
- . . . **cadmium sulfides**
- sulfur compounds
- . sulfides
- . . inorganic sulfides
- . . . **cadmium sulfides**

**cadmium tellurides**  
GS cadmium compounds

- . **cadmium tellurides**
- chalcogenides
- . tellurides
- . . **cadmium tellurides**
- tellurium compounds
- . tellurides
- . . **cadmium tellurides**

**caffeine**  
GS bases (chemical)

- . alkaloids
- . . **caffeine**
- drugs
- . stimulants
- . . **caffeine**
- fungicides
- . xanthines
- . . **caffeine**
- nitrogen compounds
- . alkaloids
- . . **caffeine**
- . xanthines
- . . **caffeine**
- organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . alkaloids
- . . . . **caffeine**
- . . . purines
- . . . . xanthines
- . . . . . **caffeine**

*CAI*  
USE **computer assisted instruction**

**caissons**  
RT construction  
foundations

**Cajun rocket vehicle**  
GS rocket vehicles

- . sounding rockets
- . . **Cajun rocket vehicle**

RT Nike-Cajun rocket vehicle  
solid propellant rocket engines  
sondes

**calciferol**  
UF *vitamin D*  
GS organic compounds

- . lipids
- . . **calciferol**
- vitamins
- . **calciferol**

**calcification**  
RT arthritis  
bones  
osteocalcin

*calcination*  
USE **roasting**

**calcite**  
GS cadmium compounds

- . calcium carbonates

- . . **calcite**
- carbon compounds
- . carbonates
- . . calcium carbonates
- . . . **calcite**
- minerals
- . **calcite**

RT aragonite  
birefringence

**calcium**  
GS chemical elements

- . **calcium**
- . . calcium isotopes
- metals
- . **calcium**
- . . calcium isotopes

RT calmodulin  
gypsum  
osteocalcin

*calcium 45*  
USE **calcium isotopes**

**calcium carbonates**  
GS calcium compounds

- . **calcium carbonates**
- . . akermanite
- . . aragonite
- . . calcite
- . . chalk
- carbon compounds
- . carbonates
- . . **calcium carbonates**
- . . . akermanite
- . . . aragonite
- . . . calcite
- . . . chalk

RT bone mineral content  
limestone

**calcium chlorides**  
GS calcium compounds

- . **calcium chlorides**
- halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **calcium chlorides**
- . halides
- . . chlorides
- . . . **calcium chlorides**
- . . metal halides
- . . . **calcium chlorides**

**calcium compounds**  
GS **calcium compounds**

- . calcium carbonates
- . . akermanite
- . . aragonite
- . . calcite
- . . chalk
- . calcium chlorides
- . calcium fluorides
- . . fluorspar
- . calcium oxides
- . . akermanite
- . calcium phosphates
- . calcium silicates
- . . gehlenite
- . calcium sulfides
- . calcium tungstates
- . calcium vanadates
- . fluorite
- . merwinite
- . monticellite
- . perovskites
- . scheelite

RT ∞ alkaline earth compounds  
∞ chemical compounds  
∞ metal compounds

**calcium fluorides**  
GS calcium compounds

- . **calcium fluorides**
- . . fluorspar
- halogen compounds
- . fluorine compounds
- . . fluorides
- . . . difluorides
- . . . . **calcium fluorides**

- . . . . fluorspar
- . . . metal fluorides
- . . . . **calcium fluorides**
- . . . . fluorspar
- . halides
- . . fluorides
- . . difluorides
- . . . . **calcium fluorides**
- . . . . fluorspar
- . . . metal fluorides
- . . . . **calcium fluorides**
- . . . . fluorspar
- . . . metal halides
- . . . metal fluorides
- . . . . **calcium fluorides**
- . . . . fluorspar

**calcium isotopes**  
UF *calcium 45*  
GS chemical elements

- . calcium
- . . **calcium isotopes**
- . nuclides
- . . isotopes
- . . . **calcium isotopes**
- metals
- . calcium
- . . **calcium isotopes**

**calcium metabolism**  
GS metabolism

- . **calcium metabolism**

RT bed rest  
calmodulin  
osteoporosis  
parathyroid gland  
thyroid gland

**calcium oxides**  
UF *lime*  
GS calcium compounds

- . **calcium oxides**
- . . akermanite
- chalcogenides
- . oxides
- . . metal oxides
- . . . alkaline earth oxides
- . . . . **calcium oxides**
- . . . . akermanite

RT BSCCO superconductors

**calcium phosphates**  
UF *apatites*  
GS calcium compounds

- . **calcium phosphates**
- phosphorus compounds
- . phosphates
- . . **calcium phosphates**

RT bone mineral content  
kidney stones

**calcium silicates**  
GS calcium compounds

- . **calcium silicates**
- . . gehlenite
- silicon compounds
- . silicates
- . . **calcium silicates**
- . . . gehlenite

RT amphiboles  
minerals  
plagioclase

**calcium sulfides**  
GS calcium compounds

- . **calcium sulfides**
- chalcogenides
- . sulfides
- . . inorganic sulfides
- . . . **calcium sulfides**
- sulfur compounds
- . sulfides
- . . inorganic sulfides
- . . . **calcium sulfides**

**calcium tungstates**  
GS calcium compounds

- . **calcium tungstates**
- tungsten compounds
- . tungstates

- . . calcium tungstates
- calcium vanadates**
  - GS calcium compounds
  - . calcium vanadates
  - vanadium compounds
  - . vanadates
  - . . calcium vanadates
- calculation*
  - USE **computation**
- calculators**
  - RT arithmetic
  - computation
  - computers
- calculi**
  - UF *renal calculi*
  - GS deposits
  - . calculi
  - . . dental calculi
  - RT lithiasis
  - uroolithiasis
- calculus**
  - SN (LIMITED TO MATHEMATICS)
  - GS analysis (mathematics)
  - . calculus
  - . . continuity (mathematics)
  - . . differential calculus
  - . . Fourier-Bessel transformations
  - . . Graeff calculus
  - . . integral calculus
  - . . limits (mathematics)
  - . . series (mathematics)
    - . . . asymptotic series
    - . . . Campbell-Hausdorff series
    - . . . cosine series
    - . . . Fourier series
    - . . . Pade approximation
    - . . . power series
    - . . . Taylor series
    - . . . . MacLaurin series
  - . . progressions
  - . . Prony series
  - . . sine series
  - . . vector analysis
    - . . . collinearity
    - . . . coplanarity
    - . . . curl (vectors)
    - . . . vorticity
  - RT analytic geometry
  - asymptotes
  - differential equations
  - functions (mathematics)
  - $\infty$  mathematics
  - monotone functions
  - operational calculus
  - real variables
- calculus of variations**
  - UF *variation method*
  - GS analysis (mathematics)
  - . real variables
  - . . calculus of variations
  - RT Biot method
  - Castiglano variational theorem
  - differential equations
  - Euler-Lagrange equation
  - integral equations
  - invariant imbeddings
  - Jacobi matrix method
  - maxima
  - operational calculus
  - pontryagin principle
  - steepest descent method
  - variational principles
- calderas**
  - DEF Large, basin-shaped volcanic depressions, more or less circular in form, the diameter of which is many times greater than that of the included vent or vents.
  - GS landforms
  - . calderas
  - RT cones (volcanoes)
  - craters
  - lava
  - Mars volcanoes
- volcanic eruptions
- volcanoes
- volcanology
- calendars**
  - DEF Orderly arrangements of days, weeks, months, etc. to suit a particular need such as civil life.
  - GS **calendars**
    - . crop calendars
  - RT month
  - scheduling
  - time
- calibrating**
  - UF *graduation*
  - GS **calibrating**
    - . intercalibration
    - . wind tunnel calibration
  - RT accuracy
  - instrument compensation
  - instrument errors
  - measuring instruments
  - $\infty$  scaling
  - Solar Cell Calibration Facility
  - standardization
  - standards
  - temperature scales
- California**
  - GS nations
  - . United States
  - . . California
  - RT Cascade Range (CA-OR-WA)
  - Coachella Valley (CA)
  - coastal ranges (CA)
  - Death Valley (CA)
  - Feather River Basin (CA)
  - Great Basin (US)
  - Imperial Valley (CA)
  - Lake Tahoe (CA-NV)
  - Mojave Desert (CA)
  - Monterey Bay (CA)
  - Palo Verde Valley (CA)
  - Peninsular Ranges (CA)
  - Sacramento Valley (CA)
  - Salton Sea (CA)
  - San Andreas Fault
  - San Francisco (CA)
  - San Francisco Bay (CA)
  - San Joaquin Valley (CA)
  - San Pablo Bay (CA)
  - Sierra Nevada Mountains (CA)
  - Southern California
- californium**
  - GS chemical elements
  - . actinide series
  - . . transuranium elements
  - . . . californium
  - . . . . californium isotopes
  - . nuclides
  - . . isotopes
  - . . . radioactive isotopes
  - . . . . transuranium elements
  - . . . . . californium
  - . . . . . californium isotopes
  - metals
  - . actinide series
  - . . transuranium elements
  - . . . californium
  - . . . . californium isotopes
  - RT californium compounds
- californium 252*
  - USE **californium isotopes**
- californium compounds**
  - GS actinide series compounds
  - . californium compounds
  - RT californium
- californium isotopes**
  - UF *californium 252*
  - GS chemical elements
  - . actinide series
  - . . transuranium elements
  - . . . californium
  - . . . . californium isotopes
  - . nuclides
- . . isotopes
- . . . radioactive isotopes
- . . . . transuranium elements
- . . . . . californium isotopes
- metals
- . actinide series
- . . transuranium elements
- . . . californium
- . . . . californium isotopes
- . . . . . californium isotopes
- CALIPSO (Pathfinder satellite)**
  - (added October 2005)
  - DEF CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation) is an Earth observing satellite that combines an active lidar instrument with passive infrared and visible imagers to probe the vertical structure and properties of thin clouds and aerosols over the globe.
  - GS artificial satellites
  - . scientific satellites
  - . . CALIPSO (Pathfinder satellite)
  - Earth Observing System (EOS)
  - . CALIPSO (Pathfinder satellite)
  - RT aerosols
  - Aqua spacecraft
  - Aura spacecraft
  - clouds (meteorology)
  - CloudSat
  - Earth observations (from space)
  - infrared radar
  - meteorological satellites
  - meteorology
  - precipitation (meteorology)
  - remote sensing
- Callisto**
  - DEF A satellite of Jupiter orbiting at a mean distance of 1,884,000 kilometers. Also called Jupiter IV.
  - GS celestial bodies
  - . natural satellites
  - . . icy satellites
  - . . . Callisto
  - . . . Jupiter satellites
  - . . . Galilean satellites
  - . . . . Callisto
  - RT Charon
  - extraterrestrial oceans
  - Ganymede
  - Io
  - Jupiter (planet)
- calmodulin**
  - GS biopolymers
  - . proteins
  - . . calmodulin
  - organic compounds
  - . proteins
  - . . calmodulin
  - RT calcium
  - calcium metabolism
  - cytoplasm
  - gravitropism
  - regulatory mechanisms (biology)
- caloric requirements**
  - GS nutritional requirements
  - . caloric requirements
  - RT diets
  - $\infty$  food
  - metabolism
  - mineral metabolism
  - $\infty$  nutrients
  - nutrition
- caloric stimuli**
  - RT  $\infty$  stimuli
- calorimeters**
  - DEF Instruments designed to measure heat evolved or absorbed. Used for microcalorimeters.
  - UF *microcalorimeters*
  - GS measuring instruments
  - . calorimeters
  - . . bomb calorimeters
  - . . drop calorimeters
  - . . flame calorimeters
  - RT heat measurement

**calves**

high temperature tests  
scintillating fibers  
temperature measuring instruments

*calorimetry*

USE **heat measurement**

*calutrons*

USE **cyclotrons**

**calves**

GS animals  
. vertebrates  
. . . mammals  
. . . . cattle  
. . . . **calves**  
RT livestock

**Calypso**

(added January 1996)

DEF A natural satellite of Saturn orbiting at a mean distance of 294,660 kilometers.

GS celestial bodies  
. natural satellites  
. . Saturn satellites  
. . . **Calypso**  
RT Saturn (planet)

*CAM (manufacturing)*

USE **computer aided manufacturing**

**camber**

GS **camber**  
. conical camber  
. wing camber  
RT airfoils  
bending  
∞ bows  
cambered wings  
curvature  
curved beams  
deflection  
deformation  
distortion  
flexing  
fuselages  
lift  
warpage

**cambered wings**

GS airfoils  
. wings  
. . **cambered wings**  
RT camber  
fixed wings  
twisted wings  
uncambered wings  
wing camber

**Cambodia**

UF *Kampuchea*  
GS nations  
. **Cambodia**  
RT Asia

**Cambrian Period**

(added June 1989)

GS Paleozoic Era  
. **Cambrian Period**  
RT geochronology  
paleontology  
Precambrian period

*Camel aircraft*

USE **TU-104 aircraft**

**camera shutters**

RT cameras  
irises (mechanical apertures)  
Kerr cells  
panoramic cameras  
∞ shutters  
streak cameras

**camera tubes**

GS electron tubes  
. **camera tubes**  
. . image dissector tubes  
. . orthicons  
. . . image orthicons  
. . vidicons

. . . return beam vidicons  
. . . . thermicons  
RT cameras  
dynodes  
image converters  
image transducers  
monoscopes  
planotrons  
television cameras  
video equipment

**cameras**

GS optical equipment  
. **cameras**  
. . Baker-Nunn camera  
. . ballistic cameras  
. . CCD cameras  
. . Delft camera  
. . diffraction limited cameras  
. . faint object camera  
. . high speed cameras  
. . . framing cameras  
. . digital cameras  
. . I2S cameras  
. . Lallemand cameras  
. . multispectral band cameras  
. . panoramic cameras  
. . pinhole cameras  
. . Schmidt cameras  
. . streak cameras  
. . television cameras  
photographic equipment  
. **cameras**  
. . Baker-Nunn camera  
. . ballistic cameras  
. . CCD cameras  
. . Delft camera  
. . diffraction limited cameras  
. . faint object camera  
. . high speed cameras  
. . . framing cameras  
. . digital cameras  
. . I2S cameras  
. . Lallemand cameras  
. . multispectral band cameras  
. . panoramic cameras  
. . pinhole cameras  
. . Schmidt cameras  
. . streak cameras  
. . television cameras  
RT camera shutters  
camera tubes  
cinematography  
focusing  
lenses  
photography  
SIM  
streak photography  
ultraviolet photography  
underwater photography  
wide angle lenses

**Cameroon**

GS nations  
. **Cameroon**  
RT Africa

**camouflage**

RT air defense  
coverings  
netting (materials/structures)  
stealth technology

**Campbell-Hausdorff series**

GS analysis (mathematics)  
. calculus  
. . series (mathematics)  
. . . **Campbell-Hausdorff series**  
. . real variables  
. . series (mathematics)  
. . . **Campbell-Hausdorff series**

**camphor**

GS ketones  
. **camphor**  
terpenes  
. **camphor**

**cams**

GS positioning devices (machinery)

. **cams**  
RT actuators  
eccentrics  
internal combustion engines  
linkages  
mechanical devices

**Canada**

GS nations  
. **Canada**  
. . Alberta  
. . British Columbia  
. . Manitoba  
. . New Brunswick  
. . Newfoundland  
. . Northwest Territories  
. . Nova Scotia  
. . Ontario  
. . Prince Edward Island  
. . Quebec  
. . Saskatchewan  
. . Yukon Territory  
RT Anik 1  
Anik 2  
Anik 3  
Beaufort Sea (North America)  
Canadian space program  
Canadian spacecraft  
Communications Technology Satellite  
Great Lakes (North America)  
Great Plains Corridor (North America)  
Hudson Bay (Canada)  
International Field Year for Great Lakes  
International Hydrological Decade  
Labrador  
Lake Champlain Basin (NY-VT)  
North America  
Pacific Northwest (US)  
Rocky Mountains (North America)  
St Lawrence Valley (North America)  
Williston Basin (North America)

**Canadair aircraft**

UF *Canadair CF-104 aircraft*  
*CF-104 aircraft*  
GS **Canadair aircraft**  
. CL-41 aircraft  
. CL-44 aircraft  
. CL-84 aircraft  
. CL-600 challenger aircraft  
RT ∞ aircraft  
General Dynamics aircraft

*Canadair CF-104 aircraft*

USE **Canadair aircraft**  
**F-104 aircraft**

*Canadair CL-41 aircraft*

USE **CL-41 aircraft**

*Canadair CL-44 aircraft*

USE **CL-44 aircraft**

*Canadair CL-84 aircraft*

USE **CL-84 aircraft**

*Canadarm (ISS)*

(added September 2001)  
USE **Space Station Mobile Servicing System**

**Canadian Shield**

RT geology  
meteorite craters  
Precambrian period

**Canadian space program**

DEF Space research, programs, and activities undertaken by Canada.  
GS programs  
. space programs  
. . **Canadian space program**  
. . . Alouette project  
RT aerospace technology transfer  
Anik 1  
Anik 2  
Anik 3  
Anik satellites  
Canada

Canadian spacecraft  
 Communications Technology Satellite  
 NASA programs  
 Radarsat  
 scientific satellites  
 Space Station Mobile Servicing System  
 synchronous satellites  
 technology assessment  
 technology utilization

**Canadian spacecraft**

DEF Spacecraft of the Canadian Government. The following satellites have been developed: Alouette satellites, ISIS satellites, Anik satellites, and Hermes satellite. RADARSAT and MSAT are in the process of being developed.

GS **Canadian spacecraft**

. Alouette satellites  
 . . Alouette 1 satellite  
 . . Alouette 2 satellite  
 . . Alouette B satellite  
 . Anik satellites  
 . . Anik 1  
 . . Anik 2  
 . . Anik 3  
 . Radarsat

RT Canada  
 Canadian space program  
 ∞ spacecraft

**canals**

GS landforms  
 . **canals**  
 waterways  
 . **canals**  
 RT ditches  
 flood control  
 fluid flow  
 gates (openings)  
 Great Lakes (North America)  
 irrigation  
 Mars surface  
 materials handling  
 Panama  
 seepage  
 straits  
 troughs  
 water flow

**canard configurations**

DEF Pertaining to an aerodynamic vehicle in which horizontal surfaces used for trim and control are forward of the main lifting surface; the horizontal trim and control surfaces in such an arrangement.

GS aerodynamic configurations  
 . **canard configurations**

RT aircraft structures  
 ∞ configurations  
 control surfaces  
 JAS-39 aircraft  
 Saab 37 aircraft  
 tandem wing aircraft  
 X-31 aircraft

**Canary Islands**

GS landforms  
 . islands  
 . . **Canary Islands**  
 nations  
 . Spain  
 . . **Canary Islands**

**Canberra aircraft**

GS BAC aircraft  
 . **Canberra aircraft**  
 jet aircraft  
 . **Canberra aircraft**  
 monoplanes  
 . **Canberra aircraft**  
 RT ∞ aircraft  
 B-57 aircraft

*Canberra bomber*

USE **B-57 aircraft**

**cancellation**

RT contracts  
 elimination

removal  
 stopping

**cancellation circuits**

GS circuits  
 . **cancellation circuits**  
 RT display devices  
 moving target indicators  
 pulse Doppler radar  
 radar

**cancer**

UF *carcinoma*  
*sarcoma*  
 GS diseases  
 . tumors  
 . . neoplasms  
 . . . **cancer**  
 . . . . leukemias  
 RT bone marrow  
 breast  
 carcinogens  
 cells (biology)  
 immunosuppression  
 metastasis  
 oncogenes  
 radiation therapy  
 tissues (biology)  
 tumor suppressor genes  
 tumor suppressor proteins  
 ulcers

*cancer genes*

(added July 2002)

USE **oncogenes**

*canisters*

USE **cans**

**canning**

GS food processing  
 . **canning**  
 RT encapsulating  
 ∞ food

**Cannonball 2 satellite**

GS artificial satellites  
 . scientific satellites  
 . . **Cannonball 2 satellite**

*cannons*

USE **guns (ordnance)**

**cannulae**

RT ∞ tubes

**canonical forms**

GS algebra  
 . vector spaces  
 . . matrices (mathematics)  
 . . . **canonical forms**  
 RT fibers (mathematics)

**canopies**

RT aircraft structures  
 airframes  
 cockpits  
 fairings  
 windshields

**canopies (vegetation)**

DEF The topmost layers of leaves and branches of forest trees or other plants.

GS vegetation  
 . **canopies (vegetation)**  
 RT foliage  
 forests  
 grasses  
 leaf area index  
 leaves  
 plants (botany)  
 rain forests  
 sod  
 trees (plants)  
 vegetative index

**cans**

UF *canisters*  
 RT ∞ containers

drums (containers)

*cant*

USE **slopes**

**cantilever beams**

GS cantilever members  
 . **cantilever beams**  
 structural members  
 . beams (supports)  
 . . **cantilever beams**  
 RT box beams  
 I beams

**cantilever members**

GS **cantilever members**  
 . cantilever beams  
 . cantilever plates  
 RT levers

**cantilever plates**

GS cantilever members  
 . **cantilever plates**  
 structural members  
 . plates (structural members)  
 . . **cantilever plates**  
 RT anisotropic plates

*cantilever wings*

USE **wings**

**canyons**

UF *coulees*  
*gorges*  
 GS landforms  
 . **canyons**  
 . . Grand Canyon (AZ)  
 RT arroyos  
 cliffs  
 fans (landforms)  
 ravines  
 rivers  
 valleys  
 water erosion

**cap clouds**

UF *orographic clouds*  
 GS clouds (meteorology)  
 . **cap clouds**  
 RT atmospheric moisture  
 climatology  
 cloud cover  
 meteorology  
 nephanalysis  
 precipitation (meteorology)  
 weather

**capacitance**

DEF That property of a system of conductors and dielectrics which permits the storage of electrically separated charges when potential differences exist between the conductors. It is the ratio of a quantity, Q, of electricity to a potential difference, V. A capacitance value is always positive. The units are farads when the charge is expressed in coulombs and the potential in volts: C = Q/V. Capacitance is symbolized as C.

GS electrical properties  
 . **capacitance**

RT capacitance-voltage characteristics  
 capacitors  
 ∞ capacity  
 dielectric properties  
 electric charge  
 electrical impedance  
 electrostatic charge  
 inductance  
 open circuit voltage  
 RC circuits  
 reactance  
 RLC circuits

**capacitance switches**

GS switches  
 . **capacitance switches**  
 RT capacitors  
 dielectrics  
 RLC circuits

## capacitance-voltage characteristics

switching circuits

### capacitance-voltage characteristics

DEF The characteristics of a metal semiconductor contact or a semiconductor junction that manifests a measured capacitance as a function of a dc bias voltage with small, superimposed ac voltage applied to that junction or contact.

GS electrical properties  
. **capacitance-voltage characteristics**

RT capacitance  
∞ characteristics  
electric potential  
metal oxide semiconductors  
volt-ampere characteristics

### capacitive fuel gages

GS measuring instruments  
. fuel gages  
. . . **capacitive fuel gages**

RT dielectrics

### capacitors

GS **capacitors**  
. electrochemical capacitors

RT amplifiers  
ballasts (impedances)  
capacitance  
capacitance switches  
circuit protection circuits  
∞ condensers  
dielectrics  
electrets  
electric bridges  
electric energy storage  
electric filters  
electric reactors  
energy storage  
Gerdien condensers  
parallel plates  
solid state devices

### ∞ capacity

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT capacitance  
channel capacity  
output  
production engineering  
risk  
volume

### Cape Hatteras (NC)

GS landforms  
. capes (landforms)  
. . . **Cape Hatteras (NC)**

RT Atlantic Ocean  
North Carolina

### Cape Kennedy launch complex

GS launching bases  
. **Cape Kennedy launch complex**

RT ground support equipment

### Cape Verde

GS nations  
. **Cape Verde**

RT Africa  
Atlantic Ocean  
islands

### capes (landforms)

GS landforms  
. **capes (landforms)**  
. . . Cape Hatteras (NC)

RT land

### ∞ capillaries

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT capillaries (anatomy)  
capillary tubes

### capillaries (anatomy)

GS anatomy  
. circulatory system  
. . . cardiovascular system

. . . blood vessels  
. . . . **capillaries (anatomy)**  
. . . . . glomerulus

RT arterioles  
blood  
∞ capillaries

### capillary circulation

USE **capillary flow**

### capillary flow

UF *capillary circulation*

GS fluid flow  
. **capillary flow**

RT blood flow  
laminar flow  
liquid bridges  
surface tension driven convection  
thermocapillary migration

### capillary pumped loops

(added September 2003)

DEF Passive, two-phase heat transport systems that utilize the capillary pressure developed in a fine pore evaporator wick to circulate the working fluid. Often used for cooling electronic components in spacecraft, telecommunications, and other systems.

UF *CPL (heat transfer)*

RT capillary tubes  
cooling systems  
cryogenic cooling  
evaporative cooling  
heat transfer  
liquid cooling  
temperature control

### capillary tubes

RT ∞ capillaries  
capillary pumped loops  
∞ tubes

### capillary waves

GS elastic waves  
. **capillary waves**  
. . . gravity waves  
. . . baroclinic waves  
. . . ripples  
surface waves  
. **capillary waves**  
. . . gravity waves  
. . . baroclinic waves  
. . . ripples

RT interfacial tension  
two dimensional flow  
water waves

### ∞ caps

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT caps (explosives)  
coverings  
nose cones  
polar caps  
seals (stoppers)  
spherical caps

### caps (explosives)

GS explosive devices  
. initiators (explosives)  
. . . **caps (explosives)**  
igniters  
. initiators (explosives)  
. . . **caps (explosives)**

RT ∞ caps  
detonators  
exploding wires  
fuses (ordnance)  
primers (explosives)

### ∞ capsules

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT ∞ buckets  
∞ containers  
fuel capsules  
shells (structural forms)  
space capsules  
tablets

test chambers

∞ test equipment  
test vehicles  
∞ vessels

### capsules (spacecraft)

USE **space capsules**

### captive tests

DEF Holddown tests of a propulsive subsystem, rocket engine or motor as distinguished from a flight test.

GS **captive tests**

. static tests  
. . . static firing

RT engine tests  
ground tests  
missile tests  
prefiring tests  
prelaunch tests  
∞ tests

### capture cross sections

USE **absorption cross sections**

### capture effect

DEF An effect in frequency-modulation (FM) reception where the stronger signal of two stations on the same frequency completely suppresses the weaker signal.

RT absorbance

∞ absorption

∞ effects

electron capture  
frequency modulation  
frequency synchronization  
nuclear capture  
recombination reactions  
trajectory analysis

### captured air bubble vehicles

GS surface vehicles  
. **captured air bubble vehicles**  
water vehicles  
. **captured air bubble vehicles**

RT hydrofoil craft  
surface effect ships  
SWATH (ship)  
∞ vehicles

### Caravelle aircraft

USE **SE-210 aircraft**

### Carbamates (tradename)

GS esters  
. **Carbamates (tradename)**  
. . . urethanes  
poisons  
. pesticides  
. . . insecticides  
. . . **Carbamates (tradename)**  
. . . . . urethanes

### carbamides

GS nitrogen compounds  
. amides  
. . **carbamides**

### carbazoles

GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . azoles  
. . . . . pyrroles  
. . . . . **carbazoles**

### carbenes

DEF An organic radical containing divalent carbon.

RT free radicals

### carbides

DEF Compounds of carbon with one or more metallic elements.

GS carbon compounds  
. **carbides**  
. . aluminum carbides  
. . boron carbides  
. . cementite  
. . chromium carbides  
. . hafnium carbides

- .. molybdenum carbides
- .. niobium carbides
- .. silicon carbides
- .. tantalum carbides
- .. titanium carbides
- .. tungsten carbides
- .. uranium carbides
- .. vanadium carbides
- .. zirconium carbides
- RT ceramic nuclear fuels
- refractory materials

**carbohydrate metabolism**

- GS metabolism
  - . **carbohydrate metabolism**
  - .. hyperglycemia
  - .. hypoglycemia
- RT cortisone
- diabetes mellitus
- glucocorticoids
- hydrogen metabolism

**carbohydrates**

- UF *saccharides*
- GS organic compounds
  - . **carbohydrates**
  - .. citric acid
  - .. glucosides
  - ... nucleosides
  - ... adenines
  - ... guanosines
  - .. polysaccharides
  - .. cellulose
  - ... Fortisan (trademark)
  - .. chitin
  - .. dextrans
  - .. glycogens
  - .. starches
  - .. sugars
  - ... dextrans
  - ... inositols
  - .. lactose
  - ... mannitol
  - ... monosaccharides
  - ... sucrose
  - ... hexoses
  - ... galactose
  - ... glucose
  - ... pentose
  - ... ribose
  - ... xylose
- RT alcohols
- ethyl alcohol
- ∞ food
- glycerols
- ∞ nutrients
- optical activity
- ∞ oxygen compounds
- photosynthesis
- stereochemistry
- synthetic food

**carbon**

- GS chemical elements
  - . **carbon**
  - .. carbon isotopes
  - ... carbon 12
  - ... carbon 13
  - ... carbon 14
- RT activated carbon
- bitumens
- buckminsterfullerene
- carbon nanotubes
- charcoal
- coke
- decarburization
- diamonds
- fullerenes
- glassy carbon
- graphene
- graphite
- soot

**carbon 12**

- GS chemical elements
  - . carbon
  - .. carbon isotopes
  - ... **carbon 12**
  - .. nuclides
  - .. isotopes

- ... carbon isotopes
- ... **carbon 12**

**carbon 13**

- GS chemical elements
  - . carbon
  - .. carbon isotopes
  - ... **carbon 13**
  - .. nuclides
  - .. isotopes
  - ... carbon isotopes
  - ... **carbon 13**

**carbon 14**

- GS chemical elements
  - . carbon
  - .. carbon isotopes
  - ... **carbon 14**
  - .. nuclides
  - .. isotopes
  - ... carbon isotopes
  - ... **carbon 14**
  - ... radioactive isotopes
  - ... **carbon 14**

**carbon arcs**

- GS electric current
  - . electric discharges
  - .. electric arcs
  - ... **carbon arcs**
- RT arc lamps
- image furnaces

**carbon compounds**

- SN (RESTRICTED TO INORGANIC COMPOUNDS)
- GS **carbon compounds**
  - . carbides
  - .. aluminum carbides
  - .. boron carbides
  - .. cementite
  - .. chromium carbides
  - .. hafnium carbides
  - .. molybdenum carbides
  - .. niobium carbides
  - .. silicon carbides
  - .. tantalum carbides
  - .. titanium carbides
  - .. tungsten carbides
  - .. uranium carbides
  - .. vanadium carbides
  - .. zirconium carbides
  - . carbon dioxide
  - . carbon disulfide
  - . carbon monoxide
  - . carbon suboxides
  - . carbon tetrachloride
  - . carbon tetrafluoride
  - . carbonates
  - .. bastnasite
  - .. calcium carbonates
  - ... akermanite
  - ... aragonite
  - .. calcite
  - .. chalk
  - .. dolomite (mineral)
  - .. polycarbonates
  - ... Lexan (trademark)
  - .. siderites
  - .. sodium carbonates
  - .. tetraethyl orthocarbonates
  - . halocarbons
  - .. chlorocarbons
  - .. chlorofluorocarbons
  - .. fluorocarbons
  - .. halon
  - .. carbon nitrides
  - .. fullerides
- RT carbonaceous materials
- ∞ chemical compounds
- ∞ Group 4A compounds
- hydrocarbons
- methylidyne
- Swan bands

**carbon cycle**

DEF The path of carbon in living beings in which carbon dioxide is fixed by photosynthesis to form organic nutrients and ultimately restored

to the inorganic state by respiration and protoplasmic decay.

- GS cycles
  - . **carbon cycle**
- RT animals
- ∞ biology
- biomass
- ecology
- organisms
- plants (botany)
- viability

**carbon dioxide**

- GS carbon compounds
  - . **carbon dioxide**
  - .. chalcogenides
  - .. oxides
  - ... dioxides
  - ... **carbon dioxide**
- gases
- . **carbon dioxide**
- RT Chlorella
- metabolic wastes
- synthane

**carbon dioxide concentration**

- GS composition (property)
  - . chemical composition
  - .. **carbon dioxide concentration**
  - .. concentration (composition)
  - .. **carbon dioxide concentration**
  - .. gas composition
  - .. **carbon dioxide concentration**
- RT air purification
- atmospheric composition
- climate change
- decontamination
- Orbiting Carbon Observatory (OCO)
- rebreathing
- spacecraft cabin atmospheres

**carbon dioxide lasers**

- GS stimulated emission devices
  - . lasers
  - .. gas lasers
  - ... **carbon dioxide lasers**
- RT chemical lasers
- continuous wave lasers
- gas masers
- infrared lasers
- Mach-Zehnder interferometers
- molecular oscillations
- organic lasers
- polar gases
- pulsed lasers
- Q switched lasers
- stimulated emission
- TEA lasers
- waveguide lasers

**carbon dioxide removal**

- GS removal
  - . **carbon dioxide removal**
- RT air purification
- decontamination
- rebreathing
- smoke abatement

**carbon dioxide tension**

- GS **carbon dioxide tension**
  - . hypercapnia
  - . hypocapnia

**carbon disulfide**

- GS carbon compounds
  - . **carbon disulfide**
  - .. chalcogenides
  - .. sulfides
  - ... disulfides
  - ... **carbon disulfide**
- sulfur compounds
- . sulfides
- .. disulfides
- ... **carbon disulfide**

**carbon fiber reinforced plastics**

- UF *CFRP*
- GS composite materials
  - . fiber composites
  - .. **carbon fiber reinforced plastics**



## carbon fibers

- . . . carbon-phenolic composites
- . polymer matrix composites
- . reinforced plastics
- . . . **carbon fiber reinforced plastics**
- . . . . carbon-phenolic composites plastics
- . reinforced plastics
- . . . **carbon fiber reinforced plastics**
- . . . . carbon-phenolic composites
- RT braided composites
- fibers
- graphite-epoxy composites
- lay-up
- PEEK
- reinforcing fibers
- superhybrid materials
- woven composites

### carbon fibers

- GS fibers
- . reinforcing fibers
- . . . **carbon fibers**
- RT boron fibers
- carbon-phenolic composites
- carbon-silicon carbide composites
- chemical vapor infiltration
- composite materials
- fiber composites
- fiber pullout
- ∞ filaments
- polyacrylonitrile

### carbon isotopes

- GS chemical elements
- . carbon
- . . . **carbon isotopes**
- . . . . carbon 12
- . . . . carbon 13
- . . . . carbon 14
- . nuclides
- . isotopes
- . . . **carbon isotopes**
- . . . . carbon 12
- . . . . carbon 13
- . . . . carbon 14

### carbon lasers

- GS stimulated emission devices
- . lasers
- . . . **carbon lasers**
- RT chemical lasers
- gas lasers
- infrared lasers
- liquid lasers
- organic lasers
- stimulated emission

### carbon monoxide

- GS carbon compounds
- . **carbon monoxide**
- chalcogenides
- . oxides
- . . **carbon monoxide**
- gases
- . **carbon monoxide**
- RT Hopcalite (trademark)
- smog
- synthane

### carbon monoxide lasers

- GS stimulated emission devices
- . lasers
- . . gas lasers
- . . . **carbon monoxide lasers**
- RT chemical lasers
- continuous wave lasers
- infrared lasers
- molecular oscillations
- stimulated emission
- TEA lasers

### carbon monoxide poisoning

- GS diseases
- . toxic diseases
- . . **carbon monoxide poisoning**
- toxicity
- . **carbon monoxide poisoning**
- RT carboxyhemoglobin
- lethality
- occupational diseases

- pathological effects
- ∞ poisoning

### carbon nanotube based memory

- (added December 2009)
- DEF Random access memory devices based on one or more special properties of carbon nanotubes.
- GS computer components
- . computer storage devices
- . . random access memory
- . . . **carbon nanotube based memory**
- memory (computers)
- . random access memory
- . . **carbon nanotube based memory**
- RT carbon nanotubes
- chips (memory devices)
- nanotechnology

### carbon nanotubes

- (added September 2001)
- DEF Single- or multilayer nanotubes composed of cylindrical graphene sheets of bonded carbon atoms, and closed at either end with caps containing pentagonal rings. These nanotubes are single molecules typically measuring a few nanometers in diameter and several microns in length.
- UF *CNT (nanotechnology)*
- tubular fullerenes*
- GS nanostructures (devices)
- . nanotubes
- . . **carbon nanotubes**
- RT carbon
- carbon nanotube based memory
- fullerenes
- graphene
- graphite
- nanostucture (characteristics)
- single electron transistors

### carbon nitrides

- (added October 2001)
- GS carbon compounds
- . **carbon nitrides**
- nitrogen compounds
- . nitrides
- . . **carbon nitrides**
- RT amorphous materials
- boron nitrides
- ceramic coatings
- protective coatings
- semiconductors (materials)
- thin films

### carbon stars

- UF *C stars*
- GS celestial bodies
- . stars
- . . giant stars
- . . . red giant stars
- . . . . **carbon stars**
- . . . . late stars
- . . . . cool stars
- . . . . **carbon stars**
- RT asymptotic giant branch stars
- irregular variable stars
- Mira variables
- R Coronae Borealis stars
- stellar composition
- subgiant stars
- Wolf-Rayet stars

### carbon steels

- GS alloys
- . iron alloys
- . . steels
- . . . **carbon steels**
- . . . . low carbon steels
- RT high strength steels

### carbon suboxides

- DEF Colorless lacrimatory gases having unpleasant odors and boiling points of approximately -7 degrees C.
- GS carbon compounds
- . **carbon suboxides**
- chalcogenides
- . oxides

- . . **carbon suboxides**
- gases
- . **carbon suboxides**
- RT ∞ oxygen compounds

### carbon tetrachloride

- UF *tetrachloromethane*
- GS carbon compounds
- . **carbon tetrachloride**
- halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **carbon tetrachloride**
- . halides
- . . chlorides
- . . . **carbon tetrachloride**

### carbon tetrachloride poisoning

- GS diseases
- . toxic diseases
- . . **carbon tetrachloride poisoning**
- toxicity
- . **carbon tetrachloride poisoning**
- RT industrial safety
- ∞ poisoning
- toxicity and safety hazard
- toxicology

### carbon tetrafluoride

- GS carbon compounds
- . **carbon tetrafluoride**
- halogen compounds
- . fluorine compounds
- . . fluoro compounds
- . . . fluorine organic compounds
- . . . . fluorohydrocarbons
- . . . . . **carbon tetrafluoride**
- organic compounds
- . fluorine organic compounds
- . . fluorohydrocarbons
- . . . **carbon tetrafluoride**
- hydrocarbons
- . fluorohydrocarbons
- . . **carbon tetrafluoride**

### carbonaceous chondrites

DEF A group name for friable, dull-black, chondritic stony meteorites, characterized by the presence of hydrated clay type silicate minerals, by considerable amounts and a great variety of organic compounds believed to be of extraterrestrial origin; by a near or total lack of free nickel-iron; and by an abnormally high content of inert gases.

- GS celestial bodies
- . meteorites
- . . stony meteorites
- . . . carbonaceous meteorites
- . . . . **carbonaceous chondrites**
- . . . . . Alais meteorite
- . . . . . Allende meteorite
- . . . . . Cold Bokkeveld meteorite
- . . . . . Ivuna meteorite
- . . . . . Murchison meteorite
- . . . . . Murray meteorite
- . . . . . Orgueil meteorite
- . . . . . Tonk meteorite
- . . . chondrites
- . . . . **carbonaceous chondrites**
- . . . . . Alais meteorite
- . . . . . Allende meteorite
- . . . . . Cold Bokkeveld meteorite
- . . . . . Ivuna meteorite
- . . . . . Murchison meteorite
- . . . . . Murray meteorite
- . . . . . Orgueil meteorite
- . . . . . Tonk meteorite

### carbonaceous materials

- DEF Substance composed of or containing carbon or carbon compounds.
- GS **carbonaceous materials**
- . graphite
- . . pyrolytic graphite
- . peat
- . soot
- RT carbon compounds
- coal
- crude oil
- fossil fuels

lignite  
 ∞ materials  
 organic materials  
 solvent refined coal

**carbonaceous meteorites**  
 GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . **carbonaceous meteorites**  
 . . . . carbonaceous chondrites  
 . . . . . Alais meteorite  
 . . . . . Allende meteorite  
 . . . . . Cold Bokkeveld meteorite  
 . . . . . Ivuna meteorite  
 . . . . . Murchison meteorite  
 . . . . . Murray meteorite  
 . . . . . Orgueil meteorite  
 . . . . . Tonk meteorite  
 . . . . . ureilites  
 RT exobiology  
 meteoritic composition

**carbonaceous rocks**  
 GS rocks  
 . sedimentary rocks  
 . . **carbonaceous rocks**  
 . . . coal  
 . . . . anthracite  
 . . . . lignite  
 . . . . solvent refined coal  
 RT carbonates  
 regolith  
 shatter cones  
 soils

**carbonates**  
 UF *bicarbonates*  
 GS carbon compounds  
 . **carbonates**  
 . . bastnasite  
 . . calcium carbonates  
 . . . akermanite  
 . . . aragonite  
 . . . calcite  
 . . . chalk  
 . . dolomite (mineral)  
 . . polycarbonates  
 . . . Lexan (trademark)  
 . . siderites  
 . . sodium carbonates  
 . . tetraethyl orthocarbonates  
 RT alkalies  
 carbonaceous rocks  
 carbonic acid  
 molten carbonate fuel cells  
 ∞ oxygen compounds

**carbon-carbon composites**  
 GS composite materials  
 . **carbon-carbon composites**  
 RT carbon-silicon carbide composites  
 fiber composites  
 fracture strength  
 reinforcing fibers  
 thermal protection  
 thermal resistance

**carbonic acid**  
 GS acids  
 . **carbonic acid**  
 RT carbonates

**carbonic anhydrase**  
 GS biopolymers  
 . proteins  
 . . enzymes  
 . . . **carbonic anhydrase**  
 organic compounds  
 . proteins  
 . . enzymes  
 . . . **carbonic anhydrase**  
 RT acetazolamide

**carbonization**  
 GS chemical reactions  
 . **carbonization**  
 RT charring

decarbonation

**carbon-phenolic composites**  
 (added January 1993)  
 GS composite materials  
 . fiber composites  
 . . carbon fiber reinforced plastics  
 . . . **carbon-phenolic composites**  
 . . . polymer matrix composites  
 . . . reinforced plastics  
 . . . carbon fiber reinforced plastics  
 . . . . **carbon-phenolic composites**  
 . . . . resin matrix composites  
 . . . . **carbon-phenolic composites**  
 plastics  
 . reinforced plastics  
 . . carbon fiber reinforced plastics  
 . . . **carbon-phenolic composites**  
 RT ablative materials  
 carbon fibers  
 phenolic resins  
 rocket nozzles

**carbon-silicon carbide composites**  
 (added March 2005)  
 DEF Composite materials formed from carbon embedded in a matrix of silicon carbide. Also known as C/SiC composites.  
 GS composite materials  
 . ceramic matrix composites  
 . . **carbon-silicon carbide composites**  
 RT carbon fibers  
 carbon-carbon composites  
 fiber composites  
 silicon carbides

**carbonyl compounds**  
 RT ∞ chemical compounds  
 oxetane polymers

**carborane**  
 GS boron compounds  
 . boron hydrides  
 . . boranes  
 . . . **carborane**  
 hydrogen compounds  
 . hydrides  
 . . boron hydrides  
 . . . boranes  
 . . . . **carborane**

**Carborundum (trademark)**  
 RT abrasives  
 refractory materials  
 silicon carbides

**carboxyhemoglobin**  
 GS biopolymers  
 . proteins  
 . . hemoglobin  
 . . . **carboxyhemoglobin**  
 organic compounds  
 . proteins  
 . . hemoglobin  
 . . . **carboxyhemoglobin**  
 organometallic compounds  
 . hemoglobin  
 . . **carboxyhemoglobin**  
 RT blood circulation  
 carbon monoxide poisoning  
 erythrocytes

**carboxyhemoglobin test**  
 GS physiological tests  
 . **carboxyhemoglobin test**  
 RT blood  
 hematology

**carboxyl group**  
 RT carboxylic acids

**carboxylates**  
 GS esters  
 . **carboxylates**  
 RT carboxylic acids

**carboxylation**  
 GS chemical reactions  
 . **carboxylation**

RT decarboxylation

**carboxylic acids**  
 GS acids  
 . **carboxylic acids**  
 . . acrylic acid  
 . . alanine  
 . . phenylalanine  
 . . aspartic acid  
 . . citric acid  
 . . dicarboxylic acids  
 . . fatty acids  
 . . . acetic acid  
 . . . ethylenediaminetetraacetic acids  
 . . . iodoacetic acid  
 . . . acetylsalicylic acid  
 . . benzoic acid  
 . . lipoic acid  
 . . oleic acid  
 . . . palmitic acid  
 . . . propionic acid  
 . . . sebacic acid  
 . . . valeric acid  
 . . . abscisic acid  
 . . folic acid  
 . . formhydroxamic acid  
 . . formic acid  
 . . Hexogenes (trademark)  
 . . lactic acid  
 . . lysine  
 . . nicotinic acid  
 . . oxalic acid  
 . . oxamic acids  
 . . tryptophan  
 organic compounds  
 . **carboxylic acids**  
 . . acrylic acid  
 . . alanine  
 . . phenylalanine  
 . . aspartic acid  
 . . citric acid  
 . . dicarboxylic acids  
 . . fatty acids  
 . . . acetic acid  
 . . . ethylenediaminetetraacetic acids  
 . . . iodoacetic acid  
 . . . acetylsalicylic acid  
 . . benzoic acid  
 . . lipoic acid  
 . . oleic acid  
 . . . palmitic acid  
 . . . propionic acid  
 . . . sebacic acid  
 . . . valeric acid  
 . . . abscisic acid  
 . . folic acid  
 . . formhydroxamic acid  
 . . formic acid  
 . . Hexogenes (trademark)  
 . . lactic acid  
 . . lysine  
 . . nicotinic acid  
 . . oxalic acid  
 . . oxamic acids  
 . . tryptophan  
 RT carboxyl group  
 carboxylates  
 terephthalate

**carburetors**  
 UF *injection carburetors*  
 RT chokes (fuel systems)  
 contactors  
 engine parts  
 engines  
 fuel injection  
 fuel systems  
 injectors  
 internal combustion engines  
 ∞ jet nozzles  
 mixers  
 premixed flames  
 throats

**carburizing**  
 DEF Introducing carbon into a solid ferrous alloy by holding above Ac1 in contact with a suitable carbonaceous material. The carburized

## carcinogens

alloy is usually quench hardened.

GS hardening (materials)

. carburizing  
RT decarburization

### carcinogens

DEF Agents producing or inciting cancerous

growth.

RT cancer  
hazardous materials  
neoplasms

### carcinoma

USE **cancer**

### carcinotrons

GS amplifiers  
. **carcinotrons**  
electron tubes  
. vacuum tubes  
. . . microwave tubes  
. . . . traveling wave tubes  
. . . . **carcinotrons**  
microwave equipment  
. microwave tubes  
. . traveling wave tubes  
. . . **carcinotrons**

RT helitrons

### cardiac auricles

GS anatomy  
. circulatory system  
. . cardiovascular system  
. . . heart  
. . . . **cardiac auricles**

RT His bundle

### cardiac output

(added March 1991)

GS output  
. **cardiac output**  
. . heart minute volume  
. . stroke volume

RT blood volume  
cardiovascular system  
heart function  
heart rate  
physiological tests

### cardiac ventricles

GS anatomy  
. circulatory system  
. . cardiovascular system  
. . . heart  
. . . . **cardiac ventricles**

RT diastolic pressure  
echocardiography  
His bundle  
systole

### cardiograms

RT biomedical data  
cardiography  
heart

### cardiography

GS bioengineering  
. biometrics  
. . **cardiography**  
. . . ballistocardiography  
. . . . electrocardiography  
. . . . magnetocardiography  
. . . . phonocardiography  
. . . . . echocardiography  
. . . . . seismocardiography  
. . . . . vectorcardiography

RT cardiograms  
cardiovascular system  
heart  
heart diseases  
heart function  
medical equipment  
physiological tests

### cardiology

GS medical science  
. **cardiology**  
RT angiography  
artificial cardiac pacemaker  
heart

heart diseases  
heart rate  
radiocardiography

### cardiotachometers

GS medical equipment  
. **cardiotachometers**

RT heart

### cardiovascular system

DEF The system of an animal pertaining to the heart and blood vessels. Used for vascular system.

UF *vascular system*

GS anatomy  
. circulatory system  
. . **cardiovascular system**  
. . . blood vessels  
. . . . arteries  
. . . . . aorta  
. . . . . arterioles  
. . . . . capillaries (anatomy)  
. . . . . glomerulus  
. . . . . veins  
. . . heart  
. . . . cardiac auricles  
. . . . cardiac ventricles  
. . . . epicardium  
. . . . heart conduction system  
. . . . myocardium

RT angiogenesis  
angiography  
baroreflexes  
blood  
blood volume  
cardiac output  
cardiography  
carotid sinus body  
carotid sinus reflex  
cerebral vascular accidents  
diastole  
fat embolisms  
head up tilt  
heart diseases  
hematopoiesis  
hematopoietic system  
hemodynamics  
hemorrhages  
lower body negative pressure  
stroke volume  
∞ systems  
systole  
tilt-table test

### cards

GS **cards**  
. punched cards  
RT computer storage devices  
data storage

### caret wings

GS airfoils  
. wings  
. . **caret wings**  
planforms  
. **caret wings**  
RT arrow wings  
delta wings  
waveriders

### CARETS (test site)

USE **Central Atlantic Regional Ecol Test Site**

### cargo

UF *freight*  
GS **cargo**  
. air cargo  
. . air mail  
. . baggage  
RT air drop operations  
airdrops  
delivery  
freight costs  
harbors  
hauling  
materials handling  
Multi-Purpose Logistics Modules  
railroad humping tests  
rapid transit systems

transportation  
transportation energy  
trucks

### cargo aircraft

GS transport aircraft  
. **cargo aircraft**  
. . Breguet 941 aircraft  
. . C-1A aircraft  
. . C-2 aircraft  
. . C-5 aircraft  
. . C-9 aircraft  
. . C-15 aircraft  
. . C-17 aircraft  
. . C-33 aircraft  
. . C-35 aircraft  
. . C-46 aircraft  
. . C-47 aircraft  
. . C-54 aircraft  
. . C-118 aircraft  
. . C-119 aircraft  
. . C-121 aircraft  
. . C-123 aircraft  
. . C-124 aircraft  
. . C-130 aircraft  
. . C-131 aircraft  
. . C-133 aircraft  
. . C-135 aircraft  
. . C-140 aircraft  
. . C-141 aircraft  
. . C-160 aircraft  
. . CH-21 helicopter  
. . CL-44 aircraft  
. . DC 3 aircraft  
. . DC 7 aircraft  
. . P-160 aircraft  
. . P-166 aircraft  
. . spanloader aircraft  
. . YC-14 aircraft  
RT air cargo  
∞ aircraft  
Boeing 727 aircraft  
Boeing 737 aircraft  
Boeing 767 aircraft  
commercial aircraft  
heavy lift helicopters  
jet aircraft  
materials handling  
Mercure aircraft  
MH-262 aircraft  
∞ military aircraft  
monoplanes  
passenger aircraft  
SC-7 aircraft  
supersonic transports  
T-39 aircraft  
TU-154 aircraft  
utility aircraft  
VC-10 aircraft  
very large transport aircraft

### cargo ships

UF *LOTS cargo ships*  
GS surface vehicles  
. **cargo ships**  
. . Savannah nuclear ship  
. . tanker ships  
water vehicles  
. ships  
. . **cargo ships**  
. . . Savannah nuclear ship  
. . . . tanker ships  
RT artificial harbors  
deepwater terminals  
nuclear powered ships  
offshore docking  
offshore platforms  
shipyards  
tanker terminals  
wharves

### cargo spacecraft

RT Automated Transfer Vehicle  
ferry spacecraft  
∞ spacecraft

### Cargomaster aircraft

USE **C-133 aircraft**

### Caribbean region

DEF The region that consists of all or parts

of the islands of the Caribbean Sea, the Bahamas, the British dependent territories, the Virgin Islands, and the mainland areas of the three Guianas and Belize.

- RT Antigua and Barbuda
- Bahamas
- Barbados
- Belize
- Cuba
- developing nations
- Dominican Republic
- French Guiana
- Grenada
- Guyana
- Haiti
- Jamaica
- Martinique
- Surinam
- Trinidad and Tobago
- Virgin Islands
- West Indies

**Caribbean Sea**

- GS seas
  - . **Caribbean Sea**
- RT Belize
- Cuba
- Dominican Republic
- Gulf of Mexico
- Gulf Stream
- Haiti
- Panama Canal Zone
- Virgin Islands

*Caribou aircraft*

- USE **DHC 4 aircraft**

**caribous**

- GS animals
  - . vertebrates
  - . . mammals
  - . . . deer
  - . . . . **caribous**

**Carme**

(added January 1996)

DEF A natural satellite of Jupiter orbiting at a mean distance of 22,600,000 kilometers.

- GS celestial bodies
  - . natural satellites
  - . . Jupiter satellites
  - . . . **Carme**
- RT Jupiter (planet)

**carnitine**

- GS organic compounds
  - . cyclic compounds
  - . . heterocyclic compounds
  - . . . **carnitine**
- vitamins
  - . **carnitine**

**Carnot cycle**

DEF An idealized reversible thermodynamic cycle. The Carnot cycle consists of four stages: (a) an isothermal expansion of the gas at temperature T1; (b) an adiabatic expansion to temperature T2; (c) an isothermal compression at temperature T2; (d) an adiabatic compression to the original state of the gas to complete the cycle.

- GS cycles
  - . thermodynamic cycles
  - . . **Carnot cycle**
- RT adiabatic conditions
- Rankine cycle
- Stirling cycle

**carotene**

- GS organic compounds
  - . hydrocarbons
  - . . **carotene**
- pigments
  - . **carotene**
- RT retinene
- skin (anatomy)

**carotenoids**

(added August 2004)

DEF The general name for a group of fat-

soluble pigments found in green, yellow, and leafy vegetables, and yellow fruits. They are aliphatic hydrocarbons consisting of a polyisoprene backbone

- GS organic compounds
  - . hydrocarbons
  - . . aliphatic hydrocarbons
  - . . . **carotenoids**
- pigments
  - . **carotenoids**
- RT terpenes

**carotid sinus body**

- RT arteries
- blood vessels
- cardiovascular system
- carotid sinus reflex
- chemoreceptors
- circulatory system
- nerves
- sinuses

**carotid sinus reflex**

- GS reflexes
  - . baroreflexes
  - . . **carotid sinus reflex**
- RT arteries
- blood vessels
- cardiovascular system
- carotid sinus body
- circulatory system
- heart function
- nerves
- sinuses

**Carpathian Mountains (Europe)**

- GS landforms
  - . mountains
  - . . **Carpathian Mountains (Europe)**
- RT Europe

**carriages**

- RT carts
- chassis
- dollies
- frames
- landing gear
- supports
- undercarriages

**carrier density (solid state)**

DEF The charge carrier concentrations of holes and/or electrons in a semiconductor which determines its electronic characteristics and function.

- GS density (number/volume)
  - . particle density (concentration)
  - . . electron density (concentration)
  - . . . **carrier density (solid state)**
- RT acceptor materials
- carrier lifetime
- carrier transport (solid state)
- ∞ carriers
- donor materials
- electron-hole drops
- semiconductors (materials)
- Zener effect

**carrier frequencies**

- GS frequencies
  - . **carrier frequencies**
- RT carrier to noise ratios
- frequency division multiplexing
- harmonic generations
- modulation
- multiplexing
- radio frequencies
- single channel per carrier
  - . transmission
- sweep frequency
- unified S band

**carrier injection**

- GS injection
  - . **carrier injection**
- RT additives
- Barritt diodes
- bipolar transistors
- carrier lifetime
- charge carriers

charge transfer  
 injection locking  
 ion injection  
 majority carriers  
 minority carriers  
 radiative recombination  
 semiconductors (materials)  
 Suhl effect  
 traveling solvent method

**carrier lifetime**

- GS life (durability)
  - . **carrier lifetime**
- RT carrier density (solid state)
- carrier injection
- carrier mobility
- carrier transport (solid state)
- charge carriers
- minority carriers
- solar cells

**carrier mobility**

- GS electrical properties
  - . **carrier mobility**
  - . . electron mobility
  - . . hole mobility
- mobility
  - . **carrier mobility**
  - . . electron mobility
  - . . hole mobility
- transport properties
  - . **carrier mobility**
  - . . electron mobility
  - . . hole mobility
- RT carrier lifetime
- electrical resistivity
- electromagnetic properties
- excitons
- Hall effect
- ion implantation
- superconductors (materials)

*carrier modulation*

- USE **modulation**

*carrier rockets*

- USE **launch vehicles**

**carrier sense multiple access**

(added April 2000)

DEF A data transmission protocol for multi-access networks where each node in the network senses traffic and waits for it to clear before transmitting; if two or more nodes transmit simultaneously, they wait a random interval before attempting to re-transmit.

- GS protocol (computers)
  - . **carrier sense multiple access**
- telecommunication
  - . multiple access
  - . . **carrier sense multiple access**
- transmission
  - . signal transmission
  - . . data transmission
  - . . . multiple access
  - . . . . **carrier sense multiple access**
- RT communication networks
- computer networks
- Ethernet
- local area networks
- packet transmission

*carrier systems*

- USE **wireless communication**

**carrier to noise ratios**

DEF RF signal power input to the receiver divided by the noise power input.

- RT carrier frequencies
- communication satellites
- data transmission
- downlinking
- Earth terminals
- frequency modulation
- signal to noise ratios
- transmission efficiency
- uplinking

**carrier transport (solid state)**

DEF The mobility of conduction electrons or

## carrier waves

holes in semiconductors.

- RT carrier density (solid state)
- carrier lifetime
- diffusion length
- energy conversion efficiency
- solar cells

### carrier waves

DEF Waves generated at a point in the transmitting system and modulated by the signal. Used for subcarrier waves.

- UF *subcarrier waves*
- RT modulation
- radio spectra

### ∞ carriers

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aircraft carriers
- carrier density (solid state)
- charge carriers
- Zener effect

*Carrington rotation*

USE **solar rotation**

### Cartan space

- RT compressible flow
- fluid flow
- potential flow
- ∞ space

### Cartesian coordinates

DEF A coordinate system in which the locations of points in space are expressed by reference to three planes, called coordinate planes, no two of which are parallel. Used for rectangular coordinates.

- UF *rectangular coordinates*
- GS coordinates
- . **Cartesian coordinates**
- geometry
- . Euclidean geometry
- . . **Cartesian coordinates**
- RT cylindrical coordinates
- oblique coordinates

### cartilage

- GS anatomy
- . musculoskeletal system
- . . **cartilage**
- tissues (biology)
- . connective tissue
- . . **cartilage**
- RT bones
- larynx

*cartography*

USE **mapping**

*cartridge actuated devices*

USE **actuators**

**explosive devices**

### cartridges

- RT cases (containers)
- ∞ containers
- packages
- projectiles
- propellants

### carts

- GS **carts**
- . Crew Equipment Translation Aid (ISS)
- RT carriages
- materials handling
- undercarriages

### cascade control

- UF *multiloop systems*
- GS automatic control
- . feedback control
- . . **cascade control**
- RT ∞ cascades
- ∞ control
- electronic control
- optical control

remote control

### cascade flow

- GS fluid flow
- . **cascade flow**
- RT ∞ cascades
- outlet flow
- turbomachine blades

### Cascade Range (CA-OR-WA)

- GS land
- . **Cascade Range (CA-OR-WA)**
- landforms
- . mountains
- . . **Cascade Range (CA-OR-WA)**
- RT California
- Oregon
- United States
- Washington

### cascade wind tunnels

- GS test facilities
- . wind tunnels
- . . hypersonic wind tunnels
- . . . **cascade wind tunnels**
- . . hypervelocity wind tunnels
- . . . **cascade wind tunnels**
- RT hypersonic flow
- shock tunnels

### ∞ cascades

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT cascade control
- cascade flow
- circuits
- cosmic ray showers
- electron photon cascades

*cascades (fluid dynamics)*

USE **fluid dynamics**

### cascode devices

*(added August 1998)*

DEF Amplifier devices consisting of a common grounded-emitter (cathode) or source stage that drives a grounded-base output stage, resulting in high-impedance, high-gain, and low-noise,

- GS amplifiers
- . **cascode devices**
- electronic equipment
- . solid state devices
- . . semiconductor devices
- . . . **cascode devices**
- RT CMOS
- field effect transistors
- high electron mobility transistors
- switching circuits
- transistor amplifiers
- transistor circuits
- transistors

*cascode MOSFET*

USE **field effect transistors**

### case bonded propellants

- GS propellants
- . solid propellants
- . . **case bonded propellants**
- RT ammunition
- composite propellants
- explosives
- hybrid propellants
- inhibitors
- plasticizers
- solid rocket propellants

### case histories

- GS histories
- . **case histories**
- RT anthropology
- biography
- clinical medicine
- documentation
- etiology
- phenomenology
- records

sociology

### cases (containers)

- GS **cases (containers)**
- . rocket engine cases
- RT boxes (containers)
- cartridges
- ∞ containers
- missile bodies
- packages
- ∞ shelves

### ∞ casing

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT coverings
- enclosure
- jackets
- linings
- pipes (tubes)
- sheaths

*casks*

USE **barrels (containers)**

### Caspian Sea

- GS seas
- . **Caspian Sea**
- RT coasts

### Cassegrain antennas

- GS antennas
- . **Cassegrain antennas**
- RT antenna design
- Gregorian antennas
- parabolic antennas
- reflector antennas
- subreflectors
- two reflector antennas

### Cassegrain optics

- RT fiber optics
- geometrical optics
- mirrors
- ∞ optics
- reflecting telescopes
- telescopes

### Cassini mission

*(added August 1998)*

- GS space missions
- . **Cassini mission**
- RT European Space Agency
- European space programs
- Huygens probe
- international cooperation
- Mariner Mark 2 Spacecraft
- ∞ missions
- NASA space programs
- Saturn (planet)
- space exploration
- space probes
- Titan
- Titan 4B launch vehicle
- Titan atmosphere

### Cassiopeia A

- GS celestial bodies
- . nebulae
- . . **Cassiopeia A**
- . radio sources (astronomy)
- . . **Cassiopeia A**
- RT Orion nebula

### Cassiopeia constellation

- GS constellations
- . **Cassiopeia constellation**
- RT celestial bodies
- celestial sphere
- stars

### cast alloys

- GS alloys
- . **cast alloys**
- RT castings
- mechanical properties
- microstructure
- rheocasting

- squeeze casting
- Castigliano variational theorem**  
 GS theorems  
 . **Castigliano variational theorem**  
 RT calculus of variations  
 energy methods  
 Euler-Lagrange equation  
 stress analysis  
 structural analysis
- casting**  
 GS forming techniques  
 . **casting**  
 . . centrifugal casting  
 . . investment casting  
 . . propellant casting  
 . . rheocasting  
 . . sand casting  
 . . slip casting  
 . . squeeze casting  
 RT baking  
 billets  
 dies  
 extruding  
 forging  
 inclusions  
 ingots  
 liquid metals  
 melting  
 metal working  
 ∞ metallurgy  
 microstructure  
 molding materials  
 molds  
 mushy zones  
 pinholes  
 polymeric films  
 pouring  
 pultrusion  
 resin transfer molding  
 shrinkage  
 solidification
- casting solvents*  
 USE **plasticizers**
- castings**  
 GS **castings**  
 . ingots  
 . propellant casting  
 RT billets  
 cast alloys  
 defects  
 degassing  
 flat patterns  
 inclusions  
 microstructure  
 molds  
 pinholes  
 pouring  
 risers  
 solidification
- Castor 2 engine*  
 USE **TX-354 engine**
- castor oil**  
 GS oils  
 . **castor oil**  
 organic compounds  
 . lipids  
 . . **castor oil**  
 RT fatty acids
- casts**  
 RT damage assessment  
 gauze  
 plasters  
 splints
- casualties**  
 RT death  
 disasters
- evacuating (transportation)
- CAT scanner*  
 USE **computer aided tomography**
- catabolism**  
 GS metabolism  
 . **catabolism**  
 RT physiology
- cataclysmic variables**  
 GS celestial bodies  
 . stars  
 . . double stars  
 . . . binary stars  
 . . . . **cataclysmic variables**  
 . . variable stars  
 . . . **cataclysmic variables**  
 RT dwarf stars  
 eclipsing binary stars  
 flare stars  
 hot stars  
 novae  
 periodic variations  
 solar oscillations  
 stellar flares  
 stellar mass ejection  
 stellar oscillations  
 superhumps (astronomy)  
 white dwarf stars
- catalase**  
 GS biopolymers  
 . proteins  
 . . enzymes  
 . . . **catalase**  
 organic compounds  
 . proteins  
 . . enzymes  
 . . . **catalase**  
 RT cells (biology)
- ∞ **catalogs**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT astronomical catalogs  
 catalogs (publications)  
 hardware utilization lists  
 indexes (documentation)  
 lists
- catalogs (publications)**  
 GS documents  
 . **catalogs (publications)**  
 . . astronomical catalogs  
 RT ∞ catalogs  
 categories  
 documentation  
 information dissemination  
 libraries
- catalysis**  
 GS **catalysis**  
 . autocatalysis  
 RT ∞ acceleration  
 activation  
 catalytic activity  
 cracking (chemical engineering)  
 Fischer-Tropsch process  
 reaction kinetics
- catalysts**  
 GS **catalysts**  
 . electrocatalysts  
 . Hopcalite (trademark)  
 . Ziegler catalyst  
 RT accelerating agents  
 additives  
 admixtures  
 coal derived gases  
 coal derived liquids  
 enzymes  
 Grignard reactions  
 high energy fuels  
 inhibitors  
 ∞ initiators  
 platinum black  
 propellant additives  
 reagents  
 retardants
- synthesis gas
- catalytic activity**  
 RT active sites (chemistry)  
 activity (biology)  
 autocatalysis  
 catalysis  
 cracking (chemical engineering)  
 enzyme inhibitors  
 Fischer-Tropsch process  
 phosphatases
- catalytic sites*  
*(added August 2004)*  
 USE **active sites (chemistry)**
- catapults**  
 DEF A power-actuated machine or device for hurling forth something, as an airplane or missile, at a high initial speed; also a device usually explosive, for ejecting a person from an aircraft.  
 GS launchers  
 . **catapults**  
 . . rocket catapults  
 RT aircraft launching devices  
 missile launchers  
 sea launching
- cataracts**  
 GS diseases  
 . eye diseases  
 . . **cataracts**  
 RT lenses  
 occupational diseases
- catastrope theory**  
 RT discontinuity  
 divergence  
 predictions  
 ∞ theories  
 topology
- catchers**  
 RT electron bunching  
 klystrons  
 output
- catchment areas*  
 USE **watersheds**
- catecholamine**  
 GS organic compounds  
 . amines  
 . . **catecholamine**  
 . . . epinephrine  
 . . . norepinephrine  
 RT dopamine  
 hormones  
 neurotransmitters
- categories**  
 RT catalogs (publications)  
 classes  
 ∞ groups  
 ∞ sections
- catenaries**  
 GS geometry  
 . curves (geometry)  
 . . **catenaries**  
 . Euclidean geometry  
 . . analytic geometry  
 . . . **catenaries**
- catheterization**  
 RT blood vessels  
 intravenous procedures
- cathetometers**  
 GS measuring instruments  
 . optical measuring instruments  
 . . **cathetometers**  
 optical equipment  
 . optical measuring instruments  
 . . **cathetometers**
- cathode glow**  
 GS emission  
 . light emission  
 . . luminescence

## cathode ray tubes

. . . **cathode glow**  
RT cathodoluminescence  
glow discharges  
rarefied plasmas

**cathode ray tubes**  
DEF Vacuum tubes consisting essentially of an electron gun producing a concentrated electron beam (or cathode ray) which impinges on a phosphorescent coating on the back of a viewing face (or screen). The excitation of the phosphor produces light, the intensity of which is controlled by the flow of electrons. Deflection of the beam is achieved either electromagnetically by currents in coils around the tube, or electrostatically by voltages on internal deflection plates.  
GS electron tubes  
. vacuum tubes  
. . . **cathode ray tubes**  
. . . monoscopes  
. . . picture tubes  
RT display devices  
electron guns  
electron optics  
image tubes  
magnetic lenses  
oscilloscopes  
printers  
raster scanning  
television equipment  
video equipment

**cathodes**  
DEF In electron tubes, electrodes through which a primary stream of electrons enters the interelectrode space.  
GS electrodes  
. **cathodes**  
. . cell cathodes  
. . hollow cathodes  
. . tube cathodes  
. . . cold cathodes  
. . . hot cathodes  
. . . photocathodes  
. . . thermionic cathodes  
. . . tunnel cathodes  
RT anodes  
cold cathode tubes  
electrode materials  
electron emission  
∞ filaments  
frequency modulation photomultipliers  
photomultiplier tubes  
phototubes  
thermionics  
tube anodes

**cathodic coatings**  
DEF Material forming a continuous film on a base metal by mechanical coating or by electroplating.  
GS coatings  
. **cathodic coatings**  
RT anodic coatings  
cladding  
electrode materials  
electrodeposition  
electroplating  
metal oxides  
mischmetal  
oxide films  
oxides  
plating

**cathodoluminescence**  
DEF Luminescence produced when high velocity electrons bombard a metal in a vacuum, thus vaporizing small amounts of the metal which, in an excited state, emit radiation characteristic of the metal.  
GS emission  
. light emission  
. . luminescence  
. . . **cathodoluminescence**  
RT cathode glow  
light sources  
porous silicon

visible spectrum

**catholytes**  
GS conductors  
. electrolytes  
. . **catholytes**  
RT anolytes  
cell cathodes  
diaphragms (mechanics)

**cations**  
DEF Positively-charged ions.  
GS ions  
. positive ions  
. . **cations**  
. . . formyl ions  
. . . vanadyl radical  
RT anions  
cell cathodes  
ionic mobility  
metal ions

**cats**  
GS animals  
. vertebrates  
. . mammals  
. . . **cats**

**CATT devices**  
DEF Controlled avalanche transit time triodes which use avalanche multiplication in the collector depletion region of a silicon, bipolar, transistor-like structure to increase the gain and thereby achieve a higher frequency operation of silicon bipolar transistors. Used for controlled avalanche transit time devices.  
UF *controlled avalanche transit time devices*  
RT electron avalanche  
power gain  
transit time  
triodes

**cattle**  
GS animals  
. vertebrates  
. . mammals  
. . . **cattle**  
. . . calves  
RT grazing  
livestock  
rangelands

CATV  
USE **cable television**

**Caucasus Mountains (U.S.S.R.)**  
GS landforms  
. mountains  
. . **Caucasus Mountains (U.S.S.R.)**  
RT U.S.S.R.

**Cauchy integral formula**  
GS analysis (mathematics)  
. complex variables  
. . **Cauchy integral formula**

**Cauchy problem**  
UF *Riemann problem*  
GS boundary value problems  
. **Cauchy problem**  
RT differential equations  
Godunov method  
∞ problems

**Cauchy-Riemann equations**  
GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **Cauchy-Riemann equations**  
RT analytic functions  
∞ equations  
Godunov method

**caulking**  
DEF Material ranging in physical characteristics from plastic to solid to preformed. Used to seal and waterproof joints and overlaps in structures, other assemblies or portions thereof where movement may occur.

RT moisture resistance  
plugging  
sealing  
waterproofing

**causes**  
RT ∞ effects  
etiology  
∞ origins  
∞ sources

**caustic lines**  
DEF The locations of wave front interactions induced by the maneuvers of supersonic aircraft in changing direction and/or attitude.  
RT flight paths  
shock waves  
sonic booms  
supersonic flight  
wave fronts

*caustics*  
USE **alkalies**

**caustics (optics)**  
DEF The envelope of rays diffracted by surface defects in materials.  
RT diffraction  
fracture mechanics  
∞ optics  
polarized radiation  
∞ rays  
surface defects

**caves**  
RT cavities  
karst  
kettles (geology)  
underground structures

*cavitation*  
USE **cavitation flow**

**cavitation corrosion**  
GS corrosion  
. **cavitation corrosion**  
RT cavitation flow  
corrosion prevention  
corrosion resistance  
corrosion tests  
erosion

**cavitation flow**  
DEF The formation of bubbles in a liquid, occurring whenever the static pressure at any point in the fluid flow becomes less than the fluid vapor pressure. Used for cavitation and gaseous cavitation.  
UF *cavitation gaseous cavitation*  
GS fluid flow  
. turbulent flow  
. . **cavitation flow**  
. . . supercavitating flow  
RT bubbles  
cavitation corrosion  
erosion  
flow distribution  
impingement  
separated flow  
ultrasonic cleaning  
vortices  
wakes  
water

**cavities**  
UF *bores*  
GS **cavities**  
. laser cavities  
RT apertures  
boreholes  
caves  
cavity flow  
∞ cells  
crack geometry  
cracks  
defects  
ducts  
gas pockets  
hole distribution (mechanics)

- ∞ holes
  - holes (mechanics)
- ∞ hollow
  - interstices
  - karst
  - kettles (geology)
  - leakage
  - openings
  - orifices
  - outlets
  - passageways
  - perforated plates
  - perforated shells
- ∞ perforation
  - ports (openings)
  - recesses
  - tooth diseases
  - vents
  - voids
- cavitons**
  - DEF Density cavities created by localized oscillating electric fields.
  - RT electric fields
    - plasma density
    - plasma physics
    - plasma resonance
- cavity flow**
  - (added November 1991)
  - GS fluid flow
    - internal flow
    - .. **cavity flow**
  - RT cavities
    - channel flow
    - corner flow
    - ducted flow
    - engine inlets
  - ∞ flow
    - fluid boundaries
    - open channel flow
    - pipe flow
- cavity resonators**
  - UF *resonant cavities*
  - GS resonators
    - .. **cavity resonators**
    - .. superconducting cavity resonators
  - RT circulators (phase shift circuits)
    - cyclotron resonance devices
    - electron tubes
    - field mode theory
    - Helmholtz resonators
    - klystrons
    - magnetrons
    - microwave resonance
    - multimode resonators
    - oscillators
    - resonant frequencies
    - traveling wave masers
    - velocity modulation
- cavity vapor generators**
  - RT ∞ generators
    - vaporizers
    - vapors
- cays*
  - USE **keys (islands)**
- CC-106 aircraft*
  - USE **CL-44 aircraft**
- CCD*
  - USE **charge coupled devices**
- CCD cameras**
  - (added September 1995)
  - GS optical equipment
    - cameras
    - .. **CCD cameras**
    - photographic equipment
    - cameras
    - .. **CCD cameras**
  - RT CCD star tracker
    - charge coupled devices
    - Clementine spacecraft
    - digital cameras
- photography
  - .. CDC computers
  - .. CDC 6000 series computers
  - .. **CDC 6600 computer**
  - .. digital computers
  - .. CDC 6000 series computers
  - .. **CDC 6600 computer**
- CCD star tracker**
  - DEF Navigation instrument designed for the NASA space transportation system. Used for stellar (star tracker).
  - UF *Stellar (star tracker)*
  - GS tracking (position)
    - star trackers
    - .. **CCD star tracker**
  - RT CCD cameras
    - celestial navigation
    - charge coupled devices
    - spacecraft guidance
- CDC 160-A computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 160-A computer**
    - .. digital computers
    - .. **CDC 160-A computer**
- CDC 1604 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 1604 computer**
    - .. digital computers
    - .. **CDC 1604 computer**
- CDC 3100 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 3100 computer**
    - .. digital computers
    - .. **CDC 3100 computer**
- CDC 3200 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 3200 computer**
    - .. digital computers
    - .. **CDC 3200 computer**
- CDC 3600 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 3600 computer**
    - .. digital computers
    - .. **CDC 3600 computer**
- CDC 3800 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 3800 computer**
    - .. digital computers
    - .. **CDC 3800 computer**
- CDC 6000 series computers**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 6000 series computers**
    - .. CDC 6400 computer
    - .. CDC 6600 computer
    - .. CDC 6700 computer
    - .. digital computers
    - .. **CDC 6000 series computers**
    - .. CDC 6400 computer
    - .. CDC 6600 computer
    - .. CDC 6700 computer
- CDC 6400 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. CDC 6000 series computers
    - .. **CDC 6400 computer**
    - .. digital computers
    - .. CDC 6000 series computers
    - .. **CDC 6400 computer**
- CDC 6600 computer**
  - GS data processing equipment
    - computers
- CDC 6700 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. CDC 6000 series computers
    - .. **CDC 6700 computer**
    - .. digital computers
    - .. CDC 6000 series computers
    - .. **CDC 6700 computer**
- CDC 7000 series computers**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 7000 series computers**
    - .. CDC 7600 computer
    - .. digital computers
    - .. **CDC 7000 series computers**
    - .. CDC 7600 computer
- CDC 7600 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. CDC 7000 series computers
    - .. **CDC 7600 computer**
    - .. digital computers
    - .. CDC 7000 series computers
    - .. **CDC 7600 computer**
- CDC 8090 computer**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC 8090 computer**
    - .. digital computers
    - .. **CDC 8090 computer**
- CDC computers**
  - GS data processing equipment
    - computers
    - .. **CDC computers**
    - .. CDC 160-A computer
    - .. CDC 1604 computer
    - .. CDC 3100 computer
    - .. CDC 3200 computer
    - .. CDC 3600 computer
    - .. CDC 3800 computer
    - .. CDC 6000 series computers
    - .. CDC 6400 computer
    - .. CDC 6600 computer
    - .. CDC 6700 computer
    - .. CDC 7000 series computers
    - .. CDC 7600 computer
    - .. CDC 8090 computer
    - .. CDC Cyber 170 series computers
    - .. CDC Cyber 175 computer
    - .. CDC Cyber 74 computer
    - .. CDC Cyber 174 computer
    - .. CDC Cyber 203 computer
    - .. CDC Cyber 205 computer
    - .. CDC Star 100 computer
  - RT digital computers
- CDC Cyber 74 computer**
  - UF *Cyber 74 computer*
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC Cyber 74 computer**
    - .. digital computers
    - .. **CDC Cyber 74 computer**
- CDC Cyber 170 series computers**
  - GS data processing equipment
    - computers
    - .. CDC computers
    - .. **CDC Cyber 170 series computers**
    - .. CDC Cyber 175 computer
    - .. digital computers
    - .. **CDC Cyber 170 series computers**



## CDC Cyber 174 computer

. . . . CDC Cyber 175 computer

### CDC Cyber 174 computer

GS data processing equipment  
. computers  
. . CDC computers  
. . . **CDC Cyber 174 computer**  
. . digital computers  
. . . **CDC Cyber 174 computer**

### CDC Cyber 175 computer

GS data processing equipment  
. computers  
. . CDC computers  
. . . CDC Cyber 170 series computers  
. . . . **CDC Cyber 175 computer**  
. . digital computers  
. . . CDC Cyber 170 series computers  
. . . . **CDC Cyber 175 computer**

### CDC Cyber 203 computer

GS data processing equipment  
. computers  
. . CDC computers  
. . . **CDC Cyber 203 computer**  
. . digital computers  
. . . **CDC Cyber 203 computer**

### CDC Cyber 205 computer

GS data processing equipment  
. computers  
. . CDC computers  
. . . **CDC Cyber 205 computer**  
. . digital computers  
. . . **CDC Cyber 205 computer**

### CDC Star 100 computer

GS data processing equipment  
. computers  
. . CDC computers  
. . . **CDC Star 100 computer**  
. . digital computers  
. . . **CDC Star 100 computer**

### CDMA

USE **code division multiple access**

### CD-ROM

(added September 1992)  
GS computer components  
. computer storage devices  
. . read-only memory devices  
. . . **CD-ROM**  
RT data bases  
information retrieval  
information systems  
optical disks  
optical memory (data storage)

### CE/SE method

(added June 2002)  
USE **space-time CE/SE method**

### Cedar Rapids (IA)

GS cities  
. **Cedar Rapids (IA)**  
RT Iowa

### CEFOAM checkout equipment

RT checkout  
∞ test equipment

### ceiling (aircraft capability)

RT ∞ aircraft  
aircraft specifications  
∞ ceilings  
flight altitude  
flight characteristics

### ∞ ceilings

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT ceiling (aircraft capability)  
ceilings (architecture)  
ceilings (meteorology)

### ceilings (architecture)

RT buildings  
∞ ceilings  
∞ diffusers

floors  
insulation  
panels  
reflectors

### ceilings (meteorology)

DEF The height above the Earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast" or "obscuration" and not classified as "thin" or "partial".

RT aircraft landing  
∞ ceilings  
cloud height indicators  
meteorological parameters  
meteorology  
visibility

### ceilometers

USE **cloud height indicators**

### telescopes

GS electron tubes  
. vacuum tubes  
. . microwave tubes  
. . . **telescopes**  
microwave equipment  
. microwave tubes  
. . **telescopes**  
mirrors  
. **telescopes**  
optical equipment  
. image converters  
. . **telescopes**  
telescopes  
. **telescopes**  
RT solar instruments

### celestial bodies

DEF Any aggregations of matter in space constituting a unit for astronomical study, as the sun, moon, a planet, comet, star, or nebula. Also called heavenly bodies.

### GS celestial bodies

. asteroid belts  
. . Toro asteroid  
. . asteroids  
. . . Amor asteroid  
. . . Amphitrite asteroid  
. . . Apollo asteroids  
. . . Ceres asteroid  
. . . Chiron  
. . . EROS asteroid  
. . . Gasptra asteroid  
. . . Icarus asteroid  
. . . Ida asteroid  
. . . Quaoar  
. . . Toro asteroid  
. . . Toutatis asteroid  
. . . Trojan asteroids  
. . . Vesta asteroid  
. . . blazars  
. . . BL Lacertae objects  
. . . comet heads  
. . . comet nuclei  
. . . comet tails  
. . . comets  
. . . Arend-Roland comet  
. . . Austin comet  
. . . Brorsen-Metcalf comet  
. . . Encke comet  
. . . Giacobini-Zinner comet  
. . . Grigg-Skjellerup comet  
. . . Hale-Bopp comet  
. . . Halley's comet  
. . . Humason comet  
. . . IRAS-Araki-Alcock comet  
. . . Kohoutek comet  
. . . Morehouse comet  
. . . Mrkos comet  
. . . Okazaki-Levy-Rudenko comet  
. . . Schwassmann-Wachmann comet  
. . . Shoemaker-Levy 9 comet  
. . . Tempel 1 comet  
. . . Tempel 2 comet  
. . . West comet  
. . . Wild 2 comet  
. . . faint objects  
. . . galactic clusters  
. . . local group (astronomy)

. . . Virgo galactic cluster  
. . . galaxies  
. . . active galaxies  
. . . Markarian galaxies  
. . . radio galaxies  
. . . Seyfert galaxies  
. . . compact galaxies  
. . . disk galaxies  
. . . dwarf galaxies  
. . . elliptical galaxies  
. . . interacting galaxies  
. . . irregular galaxies  
. . . Maffei galaxies  
. . . Magellanic clouds  
. . . peculiar galaxies  
. . . ring galaxies  
. . . shell galaxies  
. . . spiral galaxies  
. . . Andromeda Galaxy  
. . . barred galaxies  
. . . Milky Way Galaxy  
. . . protogalaxies  
. . . starburst galaxies  
. . . Virgo galactic cluster  
. . . infrared sources (astronomy)  
. . . infrared stars  
. . . meteorites  
. . . iron meteorites  
. . . Aroos meteorite  
. . . Lazarev meteorite  
. . . Odessa meteorite  
. . . Sikhote-Alin meteorite  
. . . micrometeorites  
. . . stony meteorites  
. . . achondrites  
. . . . Bondoc meteorite  
. . . . chassignites  
. . . . Kapoeta achondrite  
. . . . nakhlites  
. . . . Norton County achondrite  
. . . . shergottites  
. . . . SNC meteorites  
. . . . ureilites  
. . . carbonaceous meteorites  
. . . carbonaceous chondrites  
. . . . . Alais meteorite  
. . . . . Allende meteorite  
. . . . . Cold Bokkeveld meteorite  
. . . . . Ivuna meteorite  
. . . . . Murchison meteorite  
. . . . . Murray meteorite  
. . . . . Orgueil meteorite  
. . . . . Tonk meteorite  
. . . . . ureilites  
. . . . . chondrites  
. . . . . Bruderheim meteorite  
. . . . . carbonaceous chondrites  
. . . . . Alais meteorite  
. . . . . Allende meteorite  
. . . . . Cold Bokkeveld meteorite  
. . . . . Ivuna meteorite  
. . . . . Murchison meteorite  
. . . . . Murray meteorite  
. . . . . Orgueil meteorite  
. . . . . Tonk meteorite  
. . . . . Harleton meteorite  
. . . . . Hvittis chondrite  
. . . . . Okhansk meteorite  
. . . . . Pantar chondrites  
. . . . . Pribram meteorite  
. . . . . tektites  
. . . . . australites  
. . . . . bediasites  
. . . . . Tungusk meteorite  
. . . . . stony-iron meteorites  
. . . . . meteoroid showers  
. . . . . Aquarid meteoroids  
. . . . . Arietid meteoroids  
. . . . . Cyrrillid meteoroids  
. . . . . Draconid meteoroids  
. . . . . Geminid meteoroids  
. . . . . Leonid meteoroids  
. . . . . Orionid meteoroids  
. . . . . Perseid meteoroids  
. . . . . Quadrantid meteoroids  
. . . . . Taurid meteoroids  
. . . . . meteoroids  
. . . . . Aquarid meteoroids  
. . . . . Arietid meteoroids

- . . . bolides
- . . . Cyrillid meteoroids
- . . . Draconid meteoroids
- . . . Geminid meteoroids
- . . . Leonid meteoroids
- . . . micrometeoroids
- . . . meteoroid dust clouds
- . . . . zodiacal dust
- . . . Orionid meteoroids
- . . . Perseid meteoroids
- . . . Quadrantid meteoroids
- . . . radio meteors
- . . . sporadic meteoroids
- . . . Taurid meteoroids
- . moonlets
- . natural satellites
- . . icy satellites
- . . . Ariel
- . . . Callisto
- . . . Dione
- . . . Enceladus
- . . . Europa
- . . . Ganymede
- . . . Hyperion
- . . . Iapetus
- . . . Mimas
- . . . Rhea (astronomy)
- . . . Tethys
- . . . Titania
- . . Jupiter satellites
- . . . Adrastea
- . . . Amalthea
- . . . Carme
- . . . Elara
- . . . Galilean satellites
- . . . . Callisto
- . . . . Europa
- . . . . Ganymede
- . . . . Io
- . . . Himalia
- . . . Leda
- . . . Lysithea
- . . . Metis
- . . . Pasiphae
- . . . Sinope
- . . . Thebe
- . . Mars satellites
- . . . Deimos
- . . . Phobos
- . . moon
- . . Neptune satellites
- . . . Galatea
- . . . Larissa
- . . . Naiad
- . . . Nereid
- . . . Proteus
- . . . Triton
- . . Pluto satellites
- . . . Charon
- . . . Hydra
- . . . Nix
- . . Saturn satellites
- . . . Calypso
- . . . Dione
- . . . Enceladus
- . . . Epimetheus
- . . . Helene
- . . . Hyperion
- . . . Iapetus
- . . . Janus
- . . . Mimas
- . . . Pandora
- . . . Phoebe
- . . . Prometheus
- . . . Rhea (astronomy)
- . . . Telesto
- . . . Tethys
- . . . Titan
- . . Uranus satellites
- . . . Ariel
- . . . Cordelia
- . . . Miranda
- . . . Oberon
- . . . Puck
- . . . Titania
- . . . Umbriel
- . nebulae
- . . Cassiopeia A
- . . Crab nebula
- . . . Gum nebula
- . . . H I regions
- . . . H II regions
- . . . Herbig-Haro objects
- . . . Orion nebula
- . . . planetary nebulae
- . . . reflection nebulae
- . . . solar nebula
- . . planetary rings
- . . . Jupiter rings
- . . . Saturn rings
- . . . Uranus rings
- . planets
- . . extrasolar planets
- . . gas giant planets
- . . . Jupiter (planet)
- . . . Neptune (planet)
- . . . Saturn (planet)
- . . . Uranus (planet)
- . . terrestrial planets
- . . . Earth (planet)
- . . . Mars (planet)
- . . . Mercury (planet)
- . . . Venus (planet)
- . . hypothetical planets
- . . protoplanets
- . . radio sources (astronomy)
- . . . Cassiopeia A
- . . . extragalactic radio sources
- . . . radio galaxies
- . . . radio jets (astronomy)
- . . quasars
- . . radio stars
- . . . pulsars
- . . solar system
- . star clusters
- . . globular clusters
- . . open clusters
- . . . Pleiades cluster
- . . . Praesepe star clusters
- . stars
- . . black holes (astronomy)
- . . brown dwarf stars
- . . double stars
- . . . binary stars
- . . . . cataclysmic variables
- . . . . companion stars
- . . . . . Nemesis (star)
- . . . . eclipsing binary stars
- . . . . . dwarf novae
- . . . . . Lambda Tauri stars
- . . . . . Zeta Aurigae star
- . . . . . Sigma Orionis
- . . . . symbiotic stars
- . . . . x ray binaries
- . . . early stars
- . . hot stars
- . . . A stars
- . . . B stars
- . . . . shell stars
- . . . . . Sigma Orionis
- . . . . blue stars
- . . . . O stars
- . . . . white dwarf stars
- . . . . Wolf-Rayet stars
- . . F stars
- . . G stars
- . . sun
- . . giant stars
- . . . asymptotic giant branch stars
- . . . Omicron Ceti star
- . . . red giant stars
- . . . . carbon stars
- . . . horizontal branch stars
- . . infrared stars
- . . late stars
- . . . cool stars
- . . . . carbon stars
- . . . . flare stars
- . . . . K stars
- . . . . M stars
- . . . . . Van Biesbroeck star
- . . . . . Mira variables
- . . . . . Omicron Ceti star
- . . . . S stars
- . . . magnetic stars
- . . . magnetars
- . . main sequence stars
- . . . dwarf stars
- . . . . . dwarf novae
- . . . . . flare stars
- . . . . . red dwarf stars
- . . . sun
- . . massive stars
- . . metallic stars
- . . neutron stars
- . . magnetars
- . . pulsars
- . . . soft gamma repeaters
- . . peculiar stars
- . . . shell stars
- . . . Sigma Orionis
- . . . symbiotic stars
- . . Praesepe star clusters
- . . protostars
- . . . pre-main sequence stars
- . . . . T Tauri stars
- . . radio stars
- . . . pulsars
- . . reference stars
- . . subdwarf stars
- . . subgiant stars
- . . supergiant stars
- . . . R Coronae Borealis stars
- . . supermassive stars
- . . triple stars
- . . variable stars
- . . . cataclysmic variables
- . . . cepheid variables
- . . . flare stars
- . . . irregular variable stars
- . . . . R Coronae Borealis stars
- . . . Lambda Tauri stars
- . . . Mira variables
- . . . . Omicron Ceti star
- . . novae
- . . . dwarf novae
- . . . Hercules nova
- . . . semiregular variable stars
- . . . supernovae
- . . . . supernova 1987A
- . . . symbiotic stars
- . . . T Tauri stars
- . . white holes (astronomy)
- . . x ray stars
- . . . soft gamma repeaters
- . . . x ray binaries
- . . Population I stars
- . . Population II stars
- . . Population III stars
- . massive compact halo objects
- . meteorite parent bodies
- . near Earth objects
- . stellar systems
- . trans-Neptunian objects
- . . Charon
- . . Pluto (planet)
- . . Quaoar
- . . dwarf planets
- . . . Ceres asteroid
- . . Pluto (planet)
- RT Aries constellation
- asteroid capture
- astrodynamics
- astrolabes
- astronomical observatories
- astronomy
- astrophysics
- ∞ bodies
- Cassiopeia constellation
- Centaurus constellation
- Corona Borealis constellation
- Cygnus constellation
- gravitational waves
- impact melts
- interstellar matter
- Lyra constellation
- orbits
- solar neighborhood
- space flight
- universe
- celestial geodesy**
- DEF The determination of the form of the Earth, of the Earth's gravitational field, and of relative positions of satellite trajectories.
- GS geodesy
- . **celestial geodesy**

## celestial mechanics

RT Explorer 29 satellite  
Explorer 36 satellite  
geodetic satellites  
GEOS 1 satellite  
GEOS 2 satellite  
GEOS 3 satellite  
International Satellite Geodesy  
Experiment  
satellite laser ranging  
time

### celestial mechanics

DEF The study of the theory of motions of celestial bodies under the influence of gravitational fields.

GS mechanics (physics)  
. classical mechanics  
. . . space mechanics  
. . . **celestial mechanics**

RT astrodynamics  
astronomy  
astrophysics  
ephemerides  
equations of motion  
four body problem  
gravitational waves  
hyperbolic trajectories  
Lagrangian equilibrium points  
long term effects  
many body problem  
orbital mechanics  
orbital resonances (celestial mechanics)  
orbits  
perturbation theory  
planets  
Roche limit  
Schach effect  
solar system  
stars  
stellar orbits  
sun  
terrestrial planets  
three body problem  
trajectory analysis  
Trojan orbits  
two body problem  
Wolf-Rayet stars

### celestial navigation

DEF The process of directing a craft from one point to another by reference to celestial bodies of known constants.

GS navigation  
. **celestial navigation**  
. . . Astroguide Navigation System  
. . . astronavigation

RT air navigation  
autonomous navigation  
CCD star tracker  
inertial navigation  
injection guidance  
interplanetary navigation  
polar navigation  
radar navigation  
radio navigation  
reference stars  
solar position  
space navigation  
spacecraft guidance  
star trackers  
surface navigation

### celestial observation

USE **astronomy**

### celestial reference systems

RT air navigation  
astronomical coordinates  
astronomical maps  
azimuth  
coordinates  
geocentric coordinates  
inertial reference systems  
interplanetary navigation  
interstellar travel  
laser guide stars  
planetocentric coordinates  
proper motion  
∞ reference systems

solar longitude  
spherical coordinates  
∞ systems

### celestial sphere

DEF An imaginary sphere of infinite radius concentric with the Earth, on which all celestial bodies except the Earth are assumed to be projected.

GS symmetrical bodies  
. bodies of revolution  
. . . spheres  
. . . **celestial sphere**

RT Aries constellation  
astronomical maps  
Cassiopeia constellation  
Centaurus constellation  
constellations  
Corona Borealis constellation  
Cygnus constellation  
horizon  
Lyra constellation  
orbital position estimation  
planispheres  
proper motion  
zenith

### cell anodes

GS electrodes  
. anodes  
. . **cell anodes**

RT anions  
anolytes  
cell cathodes  
electrode materials

### cell cathodes

GS electrodes  
. cathodes  
. . **cell cathodes**

RT catholytes  
cations  
cell anodes  
electrode materials  
electrodeposition

### cell culturing

(added August 2004)

DEF A technique for maintenance or growth of animal cells in vitro. It refers to the culturing of cells derived from dispersed cells taken from the original tissue, from a primary culture, or from a cell line or cell strain by enzymatic, mechanical, or chemical disaggregation.

GS culture techniques  
. **cell culturing**

RT cells (biology)  
clone cells  
culture media  
cultured cells  
microbiology  
organ culturing  
tissue culturing  
tissue engineering

### cell division

GS cytogenesis  
. **cell division**

RT ∞ division  
mitosis  
reproduction (biology)  
stem cells

### cell lines

(added December 2004)  
USE **cultured cells**

### cell membranes (biology)

GS membranes  
. **cell membranes (biology)**

RT cells (biology)  
cytology  
ion channels (biology)

osmosis

### cell physiology

(added August 2004)

USE **cytology**

### cellophane

RT cellulose  
∞ polymers

### ∞ cells

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT activation (biology)  
cavities  
cells (biology)  
compartments  
cores  
electrochemical cells  
electrolytic cells  
fillers  
fuel cells  
geophysical fluid flow cells  
hexagonal cells  
honeycomb structures  
Kerr cells  
lithium sulfur batteries  
particle in cell technique  
photoconductive cells  
photoelectric cells  
photovoltaic cells  
porous materials  
resolution cell  
solar cells  
tissues (biology)  
topology

### cells (biology)

UF *biological cells*

GS **cells (biology)**

. blood cells  
. . erythrocytes  
. . . reticulocytes  
. . hemocytes  
. . leukocytes  
. . . eosinophils  
. . . lymphocytes  
. . . monocytes  
. . . neutrophils  
. eukaryotes  
. fibroblasts  
. gametocytes  
. . eggs  
. . . zygotes  
. . spermatozoa  
. macrophages  
. neurons  
. . axons  
. . dendrites  
. . neuroblasts  
. cultured cells  
. osteoblasts  
. prokaryotes  
. protoplasts  
. stem cells  
. . clone cells  
. . muscle cells  
. . muscle fibers

RT anatomy  
apoptosis  
∞ biology  
cancer  
catalase  
cell culturing  
cell membranes (biology)  
∞ cells  
chlorophylls  
chloroplasts  
chromosomes  
cloning (biology)  
culture media  
cytogenesis  
cytology  
cytometry  
cytoplasm  
endoplasmic reticulum  
endothelium  
ganglia  
hematopoiesis

hemoglobin  
 histochemical analysis  
 interleukins  
 Krebs cycle  
 lysosomes  
 mitochondria  
 mitosis  
 mutagens  
 mutations  
 necrosis  
 neuroglia  
 neurotransmitters  
 nuclei (cytology)  
 organelles  
 organs  
 plasmolysis  
 plastids  
 ribosomes  
 sarcoplasmic reticulum  
 tissue engineering  
 tissues (biology)

**cellular automata**

(added May 2003)

DEF A discrete, dynamical system consisting of a regular array of cells, each of which can have one of a finite number of states. With each time step, the cell is updated according to a set of local rules based on the state of neighboring cells.

RT automata theory  
 Turing machines

**cellular manufacturing**

(added April 2000)

USE **group technology (manufacturing)**

**cellular materials (non biological)**

USE **foams**

**cellulose**

DEF The carbohydrate that is the principal constituent of wood and forms of structural framework of the wood cells.

GS biopolymers  
 . polysaccharides  
 . . **cellulose**  
 . . . Fortisan (trademark)  
 organic compounds  
 . carbohydrates  
 . . polysaccharides  
 . . . **cellulose**  
 . . . . Fortisan (trademark)  
 RT cellophane  
 lignin  
 Masonite (trademark)  
 synthetic food  
 tenite  
 wood

**cellulose nitrate**

UF *nitrocellulose*  
*pyroxylin*

GS esters  
 . organic nitrates  
 . . **cellulose nitrate**  
 explosives  
 . **cellulose nitrate**  
 nitrogen compounds  
 . nitrates  
 . . organic nitrates  
 . . . **cellulose nitrate**  
 RT double base propellants  
 double base rocket propellants

**cementation**

RT adhesive bonding  
 agglomeration  
 agglutination  
 bonding  
 heating  
 precipitation (chemistry)

**cementite**

DEF An intermetallic compound containing iron and carbon.

GS carbon compounds  
 . carbides  
 . . **cementite**  
 RT iron alloys

microstructure  
 pearlite  
 steels

**cements**

RT adhesives  
 binders (materials)  
 bricks  
 concretes  
 ∞ construction materials  
 grout  
 masonry  
 mortars (material)  
 sealing

**CEMS system**

USE **Central Electronic Management System**

**Cenozoic Era**

(added June 1989)

DEF An era of geologic time, from the beginning of the Tertiary Period to the present. (Some authors do not include the Quarternary, considering it a separate era.) It is characterized by the evolution and abundance of mammals, advanced mollusks, and birds and paleobotanically, by angiosperms. The Cenozoic Era is considered to have begun about 65 million years ago.

GS **Cenozoic Era**  
 . Quaternary period  
 . Tertiary Period  
 . . Holocene epoch  
 . . Pleistocene epoch  
 RT Cretaceous-Tertiary boundary  
 extinction  
 geochronology  
 paleontology

**censored data (mathematics)**

GS data processing  
 . **censored data (mathematics)**  
 RT approximation  
 ∞ data  
 error analysis  
 probability density functions  
 reliability  
 sampling  
 statistical analysis  
 statistical distributions

**census**

RT animals  
 demography  
 human beings  
 ∞ statistics  
 urban planning

**Centaur launch vehicle**

UF *Centaur vehicle*  
 GS launch vehicles  
 . **Centaur launch vehicle**  
 . . Atlas Centaur launch vehicle  
 rocket vehicles  
 . **Centaur launch vehicle**  
 . . Atlas Centaur launch vehicle  
 RT Atlas D ICBM  
 liquid propellant rocket engines  
 Saturn project  
 Titan Centaur launch vehicle

**Centaur project**

GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Centaur project**  
 . projects  
 . . **Centaur project**  
 . space programs  
 . . NASA space programs  
 . . . **Centaur project**  
 RT Atlas Centaur launch vehicle  
 launch vehicles  
 Mariner program  
 RL-10 engines

Surveyor project

**Centaur vehicle**

USE **Centaur launch vehicle**

**Centaurus constellation**

GS constellations  
 . **Centaurus constellation**  
 RT celestial bodies  
 celestial sphere  
 stars

**center of gravity**

DEF The center of mass of a system of masses, as the barycenter of the Earth-moon system. Used for barycenter.

UF *barycenter*  
 RT center of mass  
 ∞ centers  
 centroids  
 gravitational fields  
 lunar rotation  
 mass  
 moments of inertia

**center of mass**

DEF A point of a material body or system of bodies which moves as though the system's total mass existed at that point and all external forces were applied at the point.

GS mass  
 . **center of mass**  
 RT center of gravity  
 mascons  
 weight (mass)

**center of pressure**

RT ∞ centers  
 hydrostatic pressure  
 moments of inertia  
 pressure  
 pressure distribution  
 pressure heads

**centerbodies**

RT afterbodies  
 aircraft structures  
 ∞ bodies  
 cylindrical bodies  
 forebodies  
 fuselages

**∞ centers**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT center of gravity  
 center of pressure  
 color centers  
 concentricity  
 foci  
 loci  
 world data centers

**centimeter waves**

DEF Electromagnetic radiation in the 3,000 to 30,000 MHz range.

GS electromagnetic radiation  
 . radio waves  
 . . short wave radiation  
 . . . microwaves  
 . . . . **centimeter waves**  
 RT cosmic noise  
 extraterrestrial radio waves  
 microwave frequencies  
 superhigh frequencies

**Central African Republic**

GS nations  
 . **Central African Republic**  
 RT Africa

**Central America**

GS regions  
 . **Central America**  
 RT Belize  
 Costa Rica  
 El Salvador  
 Guatemala  
 Honduras  
 Nicaragua

## Central Atlantic Region (US)

North America  
Panama  
Panama Canal Zone  
South America

**Central Atlantic Region (US)**  
GS regions  
RT **Central Atlantic Region (US)**  
United States

**Central Atlantic Regional Ecol Test Site**  
SN (CENTRAL ATLANTIC REGIONAL ECOLOGICAL TEST SITE)  
UF *CARETS (test site)*  
GS sites  
RT **Central Atlantic Regional Ecol Test Site**  
test facilities  
RT **Central Atlantic Regional Ecol Test Site**  
ecology  
environment protection

*central bulge (galaxies)*  
USE **galactic bulge**

**Central Electronic Management System**  
UF *CEMS system*  
GS data processing  
RT **Central Electronic Management System**  
management  
∞ systems

**Central Europe**  
GS continents  
RT **Central Europe**  
regions  
RT Austria  
continents  
Czechoslovakia  
East Germany  
Germany  
Hungary  
Poland  
Romania  
West Germany

**central nervous system**  
GS anatomy  
RT **central nervous system**  
nervous system  
RT **central nervous system**  
brain  
brain stem  
cerebellum  
cerebral ventricles  
cerebrum  
cerebral cortex  
occipital lobes  
diencephalon  
hypothalamus  
pineal gland  
thalamus  
hippocampus  
spinal cord  
RT blood-brain barrier  
psychopharmacology  
psychotropic drugs  
∞ systems

**central nervous system depressants**  
GS depressants  
RT **central nervous system depressants**  
drugs  
RT **central nervous system depressants**  
amobarbital  
psychopharmacology  
∞ systems  
tranquilizers

**central nervous system stimulants**  
GS drugs  
RT **central nervous system stimulants**  
amphetamines  
psychopharmacology

∞ systems

**Central Piedmont (US)**  
GS landforms  
RT **Central Piedmont (US)**  
terraces (landforms)  
plateaus  
piedmonts  
**Central Piedmont (US)**  
mountains

**central processing units**  
DEF The units of computing systems that include the circuits controlling the interpretation of instructions and their execution. Used for processors (computers).  
UF *processors (computers)*  
GS computer components  
RT **central processing units**  
arithmetic and logic units  
RISC processors  
chips (electronics)  
computer storage devices  
computers  
control units (computers)  
logic circuits  
microprocessors  
registers (computers)

**centrifugal casting**  
GS forming techniques  
RT **centrifugal casting**  
investment casting

**centrifugal compressors**  
GS compressors  
RT **centrifugal compressors**  
turbomachinery  
blowers  
compressor blades  
compressor rotors  
impellers  
pump impellers  
pumps  
radial flow  
rotors  
superchargers  
turbocompressors

**centrifugal force**  
DEF The apparent force in a rotating system, deflecting masses radially from the axis or rotation.  
RT angular acceleration  
centrifuges  
centripetal force  
∞ force  
Goertler instability

**centrifugal pumps**  
GS pumps  
RT **centrifugal pumps**  
turbomachinery  
axial flow pumps  
fuel pumps  
impellers  
pump impellers  
turbine pumps  
turbocompressors

**centrifuges**  
DEF Specifically in aerospace, large motor driven apparatus with long arms at the end of which human and animal subjects or equipment can be revolved and rotated at various speeds to simulate (very closely) the (prolonged) accelerations in high performance aircraft, rockets, and spacecraft. Sometimes called astronautical centrifuges. Used for cyclones (equipment).  
UF *cyclones (equipment)*  
GS **centrifuges**  
human centrifuges  
RT centrifugal force  
centrifuging  
centripetal force  
classifiers  
clinostats  
concentrators

extraction  
flight simulators  
fluid filters  
high gravity environments  
separators  
space simulators  
∞ test equipment  
training simulators

**centrifuging**  
RT centrifuges  
clinorotation  
concentrating  
extraction  
materials recovery  
∞ separation  
swirling

**centrifuging stress**  
GS stress (biology)  
RT **centrifuging stress**  
acceleration stresses (physiology)  
stress (physiology)  
acceleration stresses (physiology)  
∞ **centrifuging stress**  
acceleration tolerance  
gravitational physiology  
gravity perception

**centripetal force**  
RT angular acceleration  
centrifugal force  
centrifuges  
∞ force  
revolving

**centroids**  
RT center of gravity  
moments of inertia

*Centurion aircraft*  
USE **Cessna 210 aircraft**

*cephalagia*  
USE **headache**

**cephalopods**  
GS animals  
RT **cephalopods**  
invertebrates  
mollusks  
∞ **cephalopods**  
octopuses

**cepheid variables**  
GS celestial bodies  
RT **cepheid variables**  
stars  
variable stars  
Cepheus constellation

**Cepheus constellation**  
GS constellations  
RT **Cepheus constellation**  
cepheid variables

**cepstra**  
DEF The Fourier transformation of the logarithm of the power spectrum.  
GS spectra  
RT **cepstra**  
power spectra  
quefrequencies

**cepstral analysis**  
DEF The application of cepstral methods to wave or signal phenomena in seismology, speech analysis, echos, underwater acoustics, etc.  
GS data processing  
RT **cepstral analysis**  
signal analysis  
voice data processing  
spectrum analysis  
acoustic measurement  
audio frequencies  
echoes  
multipath transmission  
power spectra  
signal reflection

signature analysis  
 spectral signatures  
 speech recognition  
 time lag  
 vibration measurement

*ceramal protective coatings*  
 USE **cermets**  
**protective coatings**

*ceramals*  
 USE **cermets**

**ceramic bonding**  
 GS bonding  
 . **ceramic bonding**  
 RT ceramic matrix composites  
 ceramics

**ceramic coatings**  
 SN (COATINGS CONSISTING OF CERAMIC MATERIALS)  
 GS coatings  
 . inorganic coatings  
 . . **ceramic coatings**  
 . protective coatings  
 . . **ceramic coatings**  
 RT carbon nitrides  
 finishes  
 metal coatings  
 porcelain  
 sprayed coatings  
 vacuum deposition

**ceramic fibers**  
 DEF Fibers composed of ceramic materials. They are usually used for reinforcement.  
 GS fibers  
 . synthetic fibers  
 . . **ceramic fibers**  
 RT boron carbides  
 ceramic matrix composites  
 ceramics  
 chemical vapor infiltration  
 composite wrapping  
 cordage  
 fiber composites  
 fiber orientation  
 fiber strength  
 filament winding  
 ∞ filaments  
 polycarbosilanes  
 reinforcing fibers  
 silicon carbides  
 strands  
 titanium carbides

**ceramic honeycombs**  
 RT ceramic matrix composites  
 honeycomb cores  
 honeycomb structures

**ceramic matrix composites**  
 DEF Composite materials consisting of a reinforced ceramic matrix.  
 GS composite materials  
 . **ceramic matrix composites**  
 . . carbon-silicon carbide composites  
 RT aircraft construction materials  
 boron reinforced materials  
 ceramic bonding  
 ceramic fibers  
 ceramic honeycombs  
 ceramics  
 cermets  
 chemical vapor infiltration  
 composite structures  
 crack bridging  
 fiber pullout  
 fiber pushout  
 functionally gradient materials  
 matrix materials  
 nanocomposites  
 reinforcing fibers  
 silicon nitrides  
 titanium carbides  
 titanium nitrides

**ceramic nuclear fuels**  
 GS ceramics  
 . **ceramic nuclear fuels**

fuels  
 . nuclear fuels  
 . . **ceramic nuclear fuels**  
 RT carbides  
 cermets  
 nitrides  
 plutonium compounds  
 plutonium oxides  
 sol-gel processes  
 thorium compounds  
 uranium carbides  
 uranium compounds  
 uranium oxides

*ceramic-metal composites*  
 USE **cermets**

**ceramics**  
 DEF Inorganic compounds or mixtures requiring heat treatment to fuse them into homogeneous masses usually possessing high temperature strength but low ductility. Types and uses range from china for dishes to refractory liners for nozzles.  
 GS **ceramics**  
 . ceramic nuclear fuels  
 . lead zirconate titanates  
 . piezoelectric ceramics  
 . porcelain  
 . Pyroceram (trademark)  
 RT abrasives  
 Bakelite (trademark)  
 bricks  
 ceramic bonding  
 ceramic fibers  
 ceramic matrix composites  
 cermets  
 clays  
 dielectrics  
 ferroelastic materials  
 ferroelectric materials  
 frit  
 glass  
 glazes  
 heat engines  
 high temperature superconductors  
 injection molding  
 masonry  
 ∞ materials science  
 mortars (material)  
 photoacoustic microscopy  
 pyrolytic materials  
 reaction bonding  
 refractories  
 refractory coatings  
 refractory materials  
 sialon  
 silicon dioxide  
 tiles  
 vitrification  
 YBCO superconductors  
 yttria-stabilized zirconia

**cerebellum**  
 GS anatomy  
 . nervous system  
 . . central nervous system  
 . . . brain  
 . . . . **cerebellum**

**cerebral cortex**  
 GS anatomy  
 . nervous system  
 . . central nervous system  
 . . . brain  
 . . . . **cerebral cortex**  
 RT ∞ cortexes

**cerebral vascular accidents**  
 RT cardiovascular system  
 ∞ strokes

**cerebral ventricles**  
 GS anatomy  
 . nervous system  
 . . central nervous system  
 . . . brain  
 . . . . **cerebral ventricles**  
 RT cerebrospinal fluid

cerebrum

**cerebrospinal fluid**  
 GS body fluids  
 . **cerebrospinal fluid**  
 RT brain  
 cerebral ventricles  
 ∞ fluids

**cerebrum**  
 GS anatomy  
 . nervous system  
 . . central nervous system  
 . . . brain  
 . . . . **cerebrum**  
 . . . . . cerebral cortex  
 . . . . . occipital lobes  
 RT cerebral ventricles

**Cerenkov counters**  
 GS measuring instruments  
 . counters  
 . . radiation counters  
 . . . **Cerenkov counters**  
 . radiation measuring instruments  
 . . radiation counters  
 . . . **Cerenkov counters**  
 RT Alpha Magnetic Spectrometer  
 scintillation counters

*Cerenkov effect*  
 USE **Cerenkov radiation**

**Cerenkov radiation**  
 DEF The radiation from a charged particle whose velocity is greater than the phase velocity that an electromagnetic wave would have if it were propagating in the medium. The particle will continue to lose energy by radiation until its velocity is less than this phase velocity. Used for Cerenkov effect.  
 UF *Cerenkov effect*  
 GS electromagnetic radiation  
 . **Cerenkov radiation**  
 RT bremsstrahlung  
 corpuscular radiation  
 cosmic rays  
 ∞ effects  
 gamma ray bursts  
 gamma rays  
 light (visible radiation)  
 nuclear radiation  
 ∞ radiation  
 ultraviolet radiation

**CERES (experiment)**  
 (added May 2007)  
 DEF As a key component of the Earth Observing System (EOS) program, the Clouds and the Earth's Radiant Energy System (CERES) experiment aims to record cloud properties and radiative fluxes within the Earth's atmosphere. Aboard the TRMM, Terra, and Aqua spacecraft, the CERES instruments provide radiometric measurements of both solar-reflected and Earth-emitted radiation from the top of the atmosphere to the Earth's surface from three broadband channels. CERES data products provide scientists with a better understanding of the roles of clouds and the energy cycle in global climate change.  
 UF *Clouds and the Earth's Radiant Energy System*  
 GS programs  
 . projects  
 . . **CERES (experiment)**  
 RT Aqua spacecraft  
 climate change  
 cloud physics  
 clouds (meteorology)  
 data products  
 Earth atmosphere  
 Earth observations (from space)  
 Earth Observing System (EOS)  
 Earth radiation budget  
 Earth radiation budget experiment  
 radiant flux density  
 remote sensing  
 Terra spacecraft  
 terrestrial radiation

## Ceres asteroid

- TRMM satellite
  - . . . . cerium 137
  - . . . . cerium 144
  - metals
  - . rare earth elements
  - . . cerium
  - . . . **cerium isotopes**
  - . . . . cerium 137
  - . . . . cerium 144
- Ceres asteroid**
  - GS celestial bodies
    - . asteroids
    - . . **Ceres asteroid**
    - . dwarf planets
    - . . **Ceres asteroid**
  - RT asteroid belts
- ceresin**
  - GS organic compounds
    - . hydrocarbons
    - . . aliphatic hydrocarbons
    - . . . alkanes
    - . . . . paraffins
    - . . . . . **ceresin**
    - waxes
    - . **ceresin**
  - RT phase change materials
- cerium**
  - GS chemical elements
    - . rare earth elements
    - . . **cerium**
    - . . . cerium isotopes
    - . . . . cerium 137
    - . . . . cerium 144
    - metals
    - . rare earth elements
    - . . **cerium**
    - . . . cerium isotopes
    - . . . . cerium 137
    - . . . . cerium 144
  - RT mischmetal
- cerium 137**
  - GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . cerium isotopes
    - . . . . **cerium 137**
    - . . . . radioactive isotopes
    - . . . . **cerium 137**
    - . rare earth elements
    - . . cerium
    - . . . cerium isotopes
    - . . . . **cerium 137**
    - metals
    - . rare earth elements
    - . . cerium
    - . . . cerium isotopes
    - . . . . **cerium 137**
- cerium 144**
  - GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . cerium isotopes
    - . . . . **cerium 144**
    - . . . . radioactive isotopes
    - . . . . **cerium 144**
    - . rare earth elements
    - . . cerium
    - . . . cerium isotopes
    - . . . . **cerium 144**
    - metals
    - . rare earth elements
    - . . cerium
    - . . . cerium isotopes
    - . . . . **cerium 144**
- cerium compounds**
  - GS rare earth compounds
    - . **cerium compounds**
    - . . bastnasite
    - . . cerium oxides
  - RT ∞ chemical compounds
  - ∞ metal compounds
- cerium isotopes**
  - GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . **cerium isotopes**
    - . . . . cerium 137
    - . . . . cerium 144
    - . rare earth elements
    - . . cerium
    - . . . **cerium isotopes**
- cerium oxides**
  - GS chalcogenides
    - . oxides
    - . . metal oxides
    - . . . **cerium oxides**
    - . rare earth compounds
    - . . cerium compounds
    - . . **cerium oxides**
- cermets**
  - DEF Bodies consisting of ceramic particles bonded with a metal; used in aircraft, rockets, and spacecraft for high strength, high temperature applications. The name is derived from a combination of CERamic and METal. Used for ceramal protective coatings and ceramals.
  - UF *ceramal protective coatings*
    - ceramals*
    - ceramic-metal composites*
  - GS composite materials
    - . **cermets**
  - RT ceramic matrix composites
    - ceramic nuclear fuels
    - ceramics
    - combustion synthesis
    - heat resistant alloys
    - metals
    - powder metallurgy
    - refractories
    - refractory materials
    - YBCO superconductors
- certification**
  - DEF Personnel - The act of verifying and documenting that personnel have completed required training and have demonstrated specific proficiency. Process & Software - An act, whereby a responsible official provides a written guarantee that a product, process, or service satisfies all performance and design requirements.
  - RT aircraft reliability
    - checkout
    - evaluation
    - flight tests
    - performance tests
    - physiological tests
    - psychological tests
    - qualifications
    - quality control
    - selection
    - site selection
    - training evaluation
- cesium**
  - GS chemical elements
    - . alkali metals
    - . . **cesium**
    - . . . cesium isotopes
    - . . . . cesium 133
    - . . . . cesium 134
    - . . . . cesium 137
    - . . . . cesium 144
    - metals
    - . alkali metals
    - . . **cesium**
    - . . . cesium isotopes
    - . . . . cesium 133
    - . . . . cesium 134
    - . . . . cesium 137
    - . . . . cesium 144
  - RT cesium alloys
    - cesium antimonides
    - cesium bromides
    - cesium diodes
    - cesium engines
    - cesium fluorides
    - cesium halides
    - cesium hydrides
    - cesium iodides
    - cesium ions
- cesium plasma
- cesium vapor
- cesium 133**
  - GS chemical elements
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 133**
    - . nuclides
    - . . isotopes
    - . . . cesium isotopes
    - . . . . **cesium 133**
    - metals
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 133**
- cesium 134**
  - GS chemical elements
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 134**
    - . nuclides
    - . . isotopes
    - . . . cesium isotopes
    - . . . . **cesium 134**
    - . . . . radioactive isotopes
    - . . . . **cesium 134**
    - metals
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 134**
- cesium 137**
  - GS chemical elements
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 137**
    - . nuclides
    - . . isotopes
    - . . . cesium isotopes
    - . . . . **cesium 137**
    - . . . . radioactive isotopes
    - . . . . **cesium 137**
    - metals
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 137**
- cesium 144**
  - GS chemical elements
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 144**
    - . nuclides
    - . . isotopes
    - . . . cesium isotopes
    - . . . . **cesium 144**
    - . . . . radioactive isotopes
    - . . . . **cesium 144**
    - metals
    - . alkali metals
    - . . cesium
    - . . . cesium isotopes
    - . . . . **cesium 144**
- cesium alloys**
  - GS alloys
    - . **cesium alloys**
  - RT alkali metals
    - cesium
- cesium antimonides**
  - GS antimony compounds
    - . antimonides
    - . . **cesium antimonides**
    - cesium compounds
    - . **cesium antimonides**
  - RT cesium
- cesium bromides**
  - GS cesium compounds
    - . cesium halides

- . . cesium bromides
- halogen compounds
- . bromine compounds
- . . bromides
- . . . cesium bromides
- . halides
- . . bromides
- . . . cesium bromides
- . . metal halides
- . . . alkali halides
- . . . . cesium halides
- . . . . . cesium bromides
- RT cesium
- cesium compounds**
- GS **cesium compounds**
- . cesium antimonides
- . cesium halides
- . . cesium bromides
- . . cesium fluorides
- . . cesium iodides
- . cesium hydrides
- . cesium oxides
- RT ∞ alkali metal compounds
- ∞ chemical compounds
- ∞ metal compounds
- metal fuels
- cesium diodes**
- GS electron tubes
- . thermionic diodes
- . . **cesium diodes**
- . vacuum tubes
- . . **cesium diodes**
- electronic equipment
- . diodes
- . . thermionic diodes
- . . . **cesium diodes**
- RT cesium
- plasma diodes
- thermionic converters
- cesium engines**
- GS engines
- . rocket engines
- . . electric rocket engines
- . . . electrostatic engines
- . . . . ion engines
- . . . . . **cesium engines**
- RT cesium
- cesium fluorides**
- GS cesium compounds
- . cesium halides
- . . **cesium fluorides**
- halogen compounds
- . fluorine compounds
- . . fluorides
- . . . metal fluorides
- . . . . **cesium fluorides**
- . halides
- . . fluorides
- . . . metal fluorides
- . . . . **cesium fluorides**
- . . metal halides
- . . . alkali halides
- . . . . cesium halides
- . . . . . **cesium fluorides**
- . . . . metal fluorides
- . . . . . **cesium fluorides**
- RT cesium
- cesium halides**
- GS cesium compounds
- . **cesium halides**
- . . cesium bromides
- . . cesium fluorides
- . . cesium iodides
- halogen compounds
- . halides
- . . metal halides
- . . . alkali halides
- . . . . **cesium halides**
- . . . . . cesium bromides
- . . . . . cesium fluorides
- . . . . . cesium iodides
- RT cesium
- cesium hydrides**
- GS cesium compounds
- . **cesium hydrides**
- hydrogen compounds
- . hydrides
- . . metal hydrides
- . . . **cesium hydrides**
- cesium
- RT
- cesium iodides**
- GS cesium compounds
- . cesium halides
- . . **cesium iodides**
- halogen compounds
- . halides
- . . metal halides
- . . . alkali halides
- . . . . cesium halides
- . . . . . **cesium iodides**
- . iodine compounds
- . . iodides
- . . . **cesium iodides**
- RT cesium
- cesium ions**
- GS ions
- . **cesium ions**
- RT cesium
- cesium isotopes**
- GS chemical elements
- . alkali metals
- . . cesium
- . . . **cesium isotopes**
- . . . . cesium 133
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- . nuclides
- . . isotopes
- . . . **cesium isotopes**
- . . . . cesium 133
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- metals
- . alkali metals
- . . cesium
- . . . **cesium isotopes**
- . . . . cesium 133
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- cesium oxides**
- GS cesium compounds
- . **cesium oxides**
- chalcogenides
- . oxides
- . . metal oxides
- . . . **cesium oxides**
- cesium plasma**
- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . metallic plasmas
- . . . . . **cesium plasma**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . metallic plasmas
- . . . . . **cesium plasma**
- RT cesium
- thermionic converters
- cesium vapor**
- GS chemical elements
- . alkali metals
- . . **cesium vapor**
- . nuclides
- . . isotopes
- . . . **cesium vapor**
- metals
- . alkali metals
- . . **cesium vapor**
- vapors
- . **cesium vapor**
- RT cesium
- mercury vapor
- Cessna 172 aircraft**
- GS Cessna aircraft
- . **Cessna 172 aircraft**
- general aviation aircraft
- . **Cessna 172 aircraft**
- light aircraft
- . **Cessna 172 aircraft**
- monoplanes
- . **Cessna 172 aircraft**
- passenger aircraft
- . **Cessna 172 aircraft**
- single engine aircraft
- . **Cessna 172 aircraft**
- RT ∞ aircraft
- Cessna 205 aircraft**
- GS Cessna aircraft
- . **Cessna 205 aircraft**
- general aviation aircraft
- . **Cessna 205 aircraft**
- light aircraft
- . **Cessna 205 aircraft**
- monoplanes
- . **Cessna 205 aircraft**
- passenger aircraft
- . **Cessna 205 aircraft**
- single engine aircraft
- . **Cessna 205 aircraft**
- RT ∞ aircraft
- Cessna 210 aircraft**
- UF *Centurion aircraft*
- GS Cessna aircraft
- . **Cessna 210 aircraft**
- general aviation aircraft
- . **Cessna 210 aircraft**
- light aircraft
- . **Cessna 210 aircraft**
- monoplanes
- . **Cessna 210 aircraft**
- passenger aircraft
- . **Cessna 210 aircraft**
- single engine aircraft
- . **Cessna 210 aircraft**
- Cessna 402B aircraft**
- DEF A lighter, twin-engine, short-haul cargo/passenger aircraft manufactured by the Cessna Aircraft Company.
- GS Cessna aircraft
- . **Cessna 402B aircraft**
- general aviation aircraft
- . **Cessna 402B aircraft**
- light aircraft
- . **Cessna 402B aircraft**
- monoplanes
- . **Cessna 402B aircraft**
- passenger aircraft
- . **Cessna 402B aircraft**
- transport aircraft
- . short haul aircraft
- . . **Cessna 402B aircraft**
- RT ∞ aircraft
- Cessna aircraft**
- GS **Cessna aircraft**
- . A-37 aircraft
- . Cessna 172 aircraft
- . Cessna 205 aircraft
- . Cessna 210 aircraft
- . Cessna 402B aircraft
- . Cessna L-19 aircraft
- . T-37 aircraft
- RT ∞ aircraft
- Cessna L-19 aircraft**
- GS Cessna aircraft
- . **Cessna L-19 aircraft**
- light aircraft
- . **Cessna L-19 aircraft**
- monoplanes
- . **Cessna L-19 aircraft**
- observation aircraft
- . **Cessna L-19 aircraft**
- reconnaissance aircraft
- . **Cessna L-19 aircraft**



**cetane**

RT ∞ aircraft

*CETA cart (ISS)*  
(added December 2002)

USE **Crew Equipment Translation Aid (ISS)**

**cetane**  
GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . alkanes  
. . . . **cetane**

**cetyl compounds**  
GS alkyl compounds  
. **cetyl compounds**  
RT ∞ chemical compounds

*Ceylon*  
USE **Sri Lanka**

*CF-104 aircraft*  
USE **Canadair aircraft F-104 aircraft**

**CF-700 engine**  
GS engines  
. air breathing engines  
. . gas turbine engines  
. . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **CF-700 engine**  
. internal combustion engines  
. . gas turbine engines  
. . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **CF-700 engine**  
. turbine engines  
. . gas turbine engines  
. . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **CF-700 engine**  
RT vertical takeoff aircraft

*CFCs*  
USE **chlorofluorocarbons**

*CFD*  
USE **charge flow devices**

*CFRP*  
USE **carbon fiber reinforced plastics**

*CH (methylidyne)*  
USE **methylidyne**

**CH-3 helicopter**  
GS passenger aircraft  
. **CH-3 helicopter**  
Sikorsky aircraft  
. **CH-3 helicopter**  
transport aircraft  
. **CH-3 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **CH-3 helicopter**  
. . . . . rigid rotor helicopters  
. . . . . **CH-3 helicopter**  
RT S-61 helicopter

**CH-21 helicopter**  
UF *H-21 helicopter*  
*Shawnee helicopter*  
*Workhorse helicopter*  
GS Boeing aircraft  
. **CH-21 helicopter**  
transport aircraft  
. cargo aircraft  
. . **CH-21 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters

. . . . **CH-21 helicopter**

**CH-34 helicopter**  
UF *Choctaw helicopter*  
*H-34 helicopter*  
GS Sikorsky aircraft  
. **CH-34 helicopter**  
transport aircraft  
. **CH-34 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **CH-34 helicopter**  
RT S-58 helicopter

**CH-46 helicopter**  
UF *CH-113 helicopter*  
*HRB-1 helicopter*  
*Sea Knight helicopter*  
*Voyageur helicopter*  
GS Boeing aircraft  
. **CH-46 helicopter**  
passenger aircraft  
. **CH-46 helicopter**  
transport aircraft  
. **CH-46 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **CH-46 helicopter**  
. . . . . tandem rotor helicopters  
. . . . . **CH-46 helicopter**

**CH-47 helicopter**  
UF *Chinook helicopter*  
*HC-1 helicopter*  
GS Boeing aircraft  
. **CH-47 helicopter**  
passenger aircraft  
. **CH-47 helicopter**  
transport aircraft  
. **CH-47 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **CH-47 helicopter**  
. . . . . tandem rotor helicopters  
. . . . . **CH-47 helicopter**

*CH-53 helicopter*  
USE **H-53 helicopter**

**CH-54 helicopter**  
UF *S-64 helicopter*  
*Sikorsky S-64 helicopter*  
*Skycrane helicopter*  
GS passenger aircraft  
. **CH-54 helicopter**  
Sikorsky aircraft  
. **CH-54 helicopter**  
transport aircraft  
. **CH-54 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **CH-54 helicopter**

**CH-62 helicopter**  
GS Boeing aircraft  
. **CH-62 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . heavy lift helicopters  
. . . . **CH-62 helicopter**  
. . . . . military helicopters  
. . . . . **CH-62 helicopter**  
RT ∞ military aircraft

*CH-113 helicopter*  
USE **CH-46 helicopter**

**Chad**  
GS nations  
. **Chad**

RT Africa

**chaff**  
GS countermeasures  
. electronic countermeasures  
. . **chaff**  
RT deception  
electronic warfare  
radar echoes

**chain reactions (chemistry)**  
(added May 1999)  
GS chemical reactions  
. **chain reactions (chemistry)**  
RT chemical lasers  
combustion chemistry

**chain reactions (nuclear physics)**  
(added May 1999)  
GS nuclear reactions  
. nuclear fission  
. . **chain reactions (nuclear physics)**  
RT fission products  
neutrons

**chains**  
SN (EXCLUDES CHEMICAL BONDS AND NUCLEAR REACTIONS)  
RT ∞ barriers  
cables (ropes)  
fasteners  
∞ links  
molecular chains

*chairs*  
USE **seats**

**chalcogenides**  
GS **chalcogenides**  
. oxides  
. . alkoxides  
. . anhydrides  
. . . peroxides  
. . . . inorganic peroxides  
. . . . . hydrogen peroxide  
. . . . . organic peroxides  
. . . . . potassium peroxides  
. . . . . sodium peroxides  
. boron oxides  
. . brucite  
. . carbon monoxide  
. . carbon suboxides  
. . chlorine oxides  
. . dioxides  
. . . carbon dioxide  
. . . flint  
. . . hydrogen peroxide  
. . . silicon dioxide  
. . . quartz  
. . . . coesite  
. . . . . stishovite  
. . . . . sulfur dioxides  
. germanium oxides  
. heavy water  
. indium oxides  
. metal oxides  
. . alkaline earth oxides  
. . . barium oxides  
. . . . beryllium oxides  
. . . . . alexandrite  
. . . . . calcium oxides  
. . . . . akermanite  
. . . . . magnesium oxides  
. . . . . akermanite  
. . . . . periclase  
. . . aluminum oxides  
. . . alexandrite  
. . . sapphire  
. . . bismuth oxides  
. . . cerium oxides  
. . . cesium oxides  
. . . chromium oxides  
. . . cobalt oxides  
. . . copper oxides  
. . . gallium oxides  
. . . hafnium oxides  
. . . iron oxides  
. . . . hematite  
. . . . ilmenite

- . . . . magnetite
  - . . . lanthanum oxides
  - . . . lead oxides
  - . . . lithium oxides
  - . . . manganese oxides
  - . . . Hopcalite (trademark)
  - . . . mercury oxides
  - . . . mixed oxides
  - . . . BSCCO superconductors
  - . . . YBCO superconductors
  - . . . molybdenum oxides
  - . . . nickel oxides
  - . . . niobium oxides
  - . . . platinum oxides
  - . . . plutonium oxides
  - . . . potassium oxides
  - . . . scandium oxides
  - . . . silver oxides
  - . . . sodium peroxides
  - . . . strontium oxides
  - . . . tantalum oxides
  - . . . thorium oxides
  - . . . tin oxides
  - . . . titanium oxides
  - . . . anatase
  - . . . ilmenite
  - . . . rutile
  - . . . tungsten oxides
  - . . . scheelite
  - . . . uranium oxides
  - . . . vanadium oxides
  - . . . yttrium oxides
  - . . . zinc oxides
  - . . . zirconium oxides
  - . . . yttria-stabilized zirconia
  - . . nitrogen oxides
  - . . . nitric oxide
  - . . . nitrogen dioxide
  - . . . nitrogen tetroxide
  - . . . nitrous oxides
  - . . phosphorus oxides
  - . . pyroxenes
  - . . . enstatite
  - . . selenium oxides
  - . . silicon oxides
  - . . . muscovite
  - . . nephelite
  - . . . silicon dioxide
  - . . . . quartz
  - . . . . coesite
  - . . . . stishovite
  - . . . spodumene
  - . . sulfur oxides
  - . . . sulfur dioxides
  - . selenides
  - . . cadmium selenides
  - . . copper selenides
  - . . . copper indium selenides
  - . . gallium selenides
  - . . indium selenides
  - . . . copper indium selenides
  - . . lead selenides
  - . . zinc selenides
  - . sulfides
  - . . disulfides
  - . . . carbon disulfide
  - . . inorganic sulfides
  - . . . barium sulfides
  - . . . bismuth sulfides
  - . . . cadmium sulfides
  - . . . calcium sulfides
  - . . . copper sulfides
  - . . . hydrogen sulfide
  - . . . indium sulfides
  - . . . lead sulfides
  - . . . molybdenum sulfides
  - . . . molybdenum disulfides
  - . . . polysulfides
  - . . . strontium sulfides
  - . . . zinc sulfides
  - . . . . wurtzite
  - . . . . zincblende
  - . . pyrites
  - . . pyrrhotite
  - . . . troilite
  - . tellurides
  - . . bismuth tellurides
  - . . cadmium tellurides
  - . . indium tellurides
  - . . lanthanum tellurides
  - . . lead tellurides
  - . . mercury tellurides
  - . . . mercury cadmium tellurides
  - . . tin tellurides
  - . . zinc tellurides
  - RT ∞ Group 6A compounds
- chalk**
- GS calcium compounds
  - . calcium carbonates
  - . . **chalk**
  - carbon compounds
  - . carbonates
  - . . calcium carbonates
  - . . . **chalk**
  - RT gypsum
- Challenger (Orbiter)**
- UF *Space Shuttle Orbiter 099*
  - GS manned spacecraft
  - . space shuttles
  - . . Space Shuttle orbiters
  - . . . **Challenger (Orbiter)**
  - reentry vehicles
  - . recoverable spacecraft
  - . . reusable spacecraft
  - . . . space shuttles
  - . . . . Space Shuttle orbiters
  - . . . . . **Challenger (Orbiter)**
  - RT Endeavour (orbiter)
  - Space Shuttle mission 31-B
  - Space Shuttle mission 31-C
  - Space Shuttle mission 31-D
  - Space Shuttle mission 41-B
  - Space Shuttle mission 41-C
  - Space Shuttle mission 41-G
  - Space Shuttle mission 51-B
  - Space Shuttle mission 51-E
  - Space Shuttle mission 51-F
  - Space Shuttle mission 51-L
  - Space Shuttle mission 61-A
  - ∞ spacecraft
- ∞ **chambers**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT anechoic chambers
  - arc chambers
  - bubble chambers
  - cloud chambers
  - combustion chambers
  - cylindrical chambers
  - flexing
  - flow chambers
  - hyperbaric chambers
  - ionization chambers
  - plenum chambers
  - pressure chambers
  - reverberation chambers
  - spark chambers
  - test chambers
  - thrust chambers
  - vacuum chambers
- Chance-Vought aircraft**
- RT ∞ aircraft
- Chandler motion*
- USE **polar wandering (geology)**
- Chandler wobble**
- (added September 1992)
  - SN (EXCLUDES CHANDLER MOTION)
  - DEF A movement in the Earth's axis of rotation whose period of motion is about 14 months. Used for Eulerian nutation.
  - UF *Eulerian nutation*
  - GS nutation
  - . **Chandler wobble**
  - RT Earth axis
  - ∞ Earth motion
  - Earth orientation
  - Earth rotation
  - geodynamics
  - geophysics
- polar wandering (geology)
- Chandra X Ray Astrophysics Facility*  
(added March 1999)
- USE **X Ray Astrophysics Facility**
- Chandrasekhar equation**
- GS analysis (mathematics)
  - . real variables
  - . . differential equations
  - . . . **Chandrasekhar equation**
  - RT electromagnetic absorption
  - ∞ equations
- change detection**
- DEF A process of examining imagery to detect changes on a planetary surface or astronomical body.
  - GS detection
  - . **change detection**
  - RT aerial photography
  - aerial reconnaissance
  - Earth Resources Program
  - image classification
  - image processing
  - imagery
  - land use
  - multispectral band scanners
  - multispectral photography
  - pattern recognition
  - photointerpretation
  - radar imagery
  - remote sensing
  - scene analysis
  - side-looking radar
  - terrain analysis
- channel capacity**
- RT Aloha system
  - bandwidth
  - ∞ capacity
  - cochannel interference
  - demand assignment multiple access
  - frequencies
  - packet transmission
  - transmission rate (communications)
- channel flow**
- GS fluid flow
  - . internal flow
  - . . **channel flow**
  - . . . open channel flow
  - RT annular flow
  - Brinkman number
  - cavity flow
  - choked flow
  - corner flow
  - dredged materials
  - ducted flow
  - flow geometry
  - fluid injection
  - incompressible fluids
  - outlet flow
  - pipe flow
  - wall flow
- channel multipliers**
- UF *channeltrons*
  - GS multipliers
  - . **channel multipliers**
  - RT auroral spectroscopy
  - electron avalanche
  - microchannel plates
  - photomultiplier tubes
  - radiation counters
- channel noise**
- DEF In communications bursts of interruptive pulses caused mainly by contact closures in electromagnetic equipment or by transient voltages in electric cables during transmission of signals or data. Impulsive noise is the frequent cause of transmission errors.
  - RT Aloha system
  - background noise
  - cochannel interference
  - electromagnetic noise
  - noise spectra
  - random noise
  - signal to noise ratios

## channel wings

thermal noise  
time division multiple access  
trellis coding

### channel wings

GS airfoils  
. wings  
. . **channel wings**  
planforms  
. wing planforms  
. . **channel wings**  
RT aerodynamic configurations  
aircraft design  
aircraft parts  
aircraft structures

### ∞ channels

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT channels (data transmission)  
computer storage devices  
dredged materials  
ducts  
frequencies  
media  
parallel plates  
structural members  
telecommunication  
throats

### channels (data transmission)

UF *data busses*  
RT asynchronous transfer mode  
∞ channels  
∞ data  
data links  
data processing  
data transmission  
protocol (computers)  
Rayleigh fading  
single channel per carrier  
transmission

### channeltrons

USE **channel multipliers**

### chaos

(*added June 1989*)  
RT attractors (mathematics)  
branching (mathematics)  
mathematical models  
nonlinear systems  
period doubling  
stochastic processes  
strange attractors

### chaotic cloud patterns

USE **clouds (meteorology)**

### chaparral

GS plants (botany)  
. brush (botany)  
. . **chaparral**  
RT botany  
Earth resources  
trees (plants)

### Chaparral missile

GS missiles  
. surface to air missiles  
. . **Chaparral missile**  
RT space weapons

### Chaplygin equation

GS flow equations  
. **Chaplygin equation**  
RT ∞ equations  
hodographs  
vector spaces

### Chapman shear layer

USE **shear layers**

### Chapman-Enskog theory

UF *Enskog-Chapman theory*  
GS kinetic theory  
. transport theory  
. . **Chapman-Enskog theory**  
RT Boltzmann transport equation  
Burnett equations

distribution functions  
flow distribution  
monatomic gases  
rarefied gas dynamics  
temperature gradients  
∞ theories  
thermal diffusion

### Chapman-Ferraro problem

RT atmospheric models  
Earth magnetosphere  
interplanetary magnetic fields  
magnetopause  
∞ problems  
solar wind

### Chapman-Jouget flame

USE **chemical equilibrium detonation flame propagation**

### character recognition

GS recognition  
. pattern recognition  
. . **character recognition**  
RT artificial intelligence  
contrast  
∞ detectors  
graphology  
handwriting  
legibility  
optical data processing  
optical scanners  
perception  
readers  
reading  
resolution  
scene analysis  
∞ sensors  
symbols  
visibility

### characteristic equations

USE **eigenvalues eigenvectors**

### characteristic functions

USE **eigenvalues eigenvectors**

### characteristic method

USE **method of characteristics**

### ∞ characteristics

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF Specifically, distinguishing qualities, properties, features or capabilities of an entity.  
RT aerodynamic characteristics  
capacitance-voltage characteristics  
dynamic characteristics  
flight characteristics  
flow characteristics  
method of characteristics  
nanostructure (characteristics)  
polarization characteristics  
Segre characteristic  
spray characteristics  
static aerodynamic characteristics  
volt-ampere characteristics

### characterization

RT descriptions  
examination  
representations

### characters

USE **symbols**

### charcoal

GS **charcoal**  
. activated carbon  
RT adsorbents  
carbon  
coke  
fuels

### charge carriers

GS **charge carriers**  
. free electrons

. holes (electron deficiencies)  
. majority carriers  
. minority carriers  
RT carrier injection  
carrier lifetime  
∞ carriers  
electron mobility  
hole mobility

### charge coupled devices

DEF Semiconductor devices arrayed so that the electric charge at the output of one provides the input stimulus to the next. Use for CCD.  
UF *CCD*  
GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . charge transfer devices  
. . . **charge coupled devices**  
RT bucket brigade devices  
CCD cameras  
CCD star tracker  
charge injection devices  
focal plane devices  
ITO (semiconductors)

### charge distribution

GS distribution (property)  
. **charge distribution**  
electrical properties  
. **charge distribution**  
RT current distribution  
electron distribution  
electrostatic charge  
force distribution  
hole distribution (electronics)  
ion distribution  
mass distribution  
neutral atoms  
polarization (charge separation)

### charge efficiency

DEF The efficiency of electric cell recharging.  
GS efficiency  
. **charge efficiency**  
RT battery chargers  
∞ charging  
electric batteries  
primary batteries  
recharging  
storage batteries

### charge exchange

SN (LIMITED TO COLLISIONAL TRANSFER OF AN ELECTRON FROM A NEUTRAL ATOM OR MOLECULE TO AN ION--EXCLUDES SEMICONDUCTOR AND PHOTOCHEMICAL CHARGE TRANSFER)  
DEF The collisional transfer of an electron from a neutral atom or molecule to an ion.  
GS exchanging  
. **charge exchange**  
. . resonance charge exchange  
RT electron transfer  
ion atom interactions  
ion charge  
ion production rates  
plasma-particle interactions  
recoil ions

### charge flow devices

DEF Metal oxide semiconductor (MOS) devices used for fire detectors and humidity sensors. Used for CFD.  
UF *CFD*  
GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . transistors  
. . . field effect transistors  
. . . . **charge flow devices**  
RT integrated circuits  
∞ sensors

### charge injection devices

UF *CID*  
GS electronic equipment  
. solid state devices  
. . semiconductor devices

... charge transfer devices  
 ... **charge injection devices**  
 RT charge coupled devices  
 electro-optics  
 imaging techniques  
 semiconductors (materials)  
 star trackers

*charge separation*  
 USE **polarization (charge separation)**

**charge transfer**  
 SN (EXCLUDES COLLISIONAL CHARGE EXCHANGE)  
 RT carrier injection  
 charged particles  
 electron transfer  
 ion exchanging  
 ionic reactions  
 mass transfer  
 photochemical reactions  
 polarization (charge separation)  
 transferring

**charge transfer devices**  
 UF *CTD*  
 GS electronic equipment  
 . solid state devices  
 . semiconductor devices  
 . . . **charge transfer devices**  
 . . . . bucket brigade devices  
 . . . . charge coupled devices  
 . . . . charge injection devices  
 RT ITO (semiconductors)  
 organic charge transfer salts  
 tunable filters

**charged particles**  
 SN (FOR IONIC PARTICLES SEE IONS)  
 GS particles  
 . **charged particles**  
 . . antiprotons  
 . . energetic particles  
 . . . electrons  
 . . . . conduction electrons  
 . . . . free electrons  
 . . . . high energy electrons  
 . . . . relativistic electron beams  
 . . . . hot electrons  
 . . . . N electrons  
 . . . . negatrons  
 . . . . photoelectrons  
 . . . . pi-electrons  
 . . . . polarons  
 . . . . solar electrons  
 . . . nuclei (nuclear physics)  
 . . . . alpha particles  
 . . . . deuterons  
 . . . . even-even nuclei  
 . . . . heavy nuclei  
 . . . . hypernuclei  
 . . . . odd-even nuclei  
 . . . . odd-odd nuclei  
 . . . . tritons  
 . . . plasmas (physics)  
 . . . . argon plasma  
 . . . . beta particles  
 . . . . boundary layer plasmas  
 . . . . cold plasmas  
 . . . . collisional plasmas  
 . . . . . strongly coupled plasmas  
 . . . . collisionless plasmas  
 . . . . cosmic plasma  
 . . . . cylindrical plasmas  
 . . . . dense plasmas  
 . . . . . plasma focus  
 . . . . . strongly coupled plasmas  
 . . . . electron plasma  
 . . . . electron-positron plasmas  
 . . . . elliptical plasmas  
 . . . . helium plasma  
 . . . . high temperature plasmas  
 . . . . hydrogen plasma  
 . . . . . deuterium plasma  
 . . . . laser plasmas  
 . . . . metallic plasmas  
 . . . . . cesium plasma  
 . . . . . uranium plasmas  
 . . . . microplasmas  
 . . . . nitrogen plasma

... nonequilibrium plasmas  
 ... nonuniform plasmas  
 ... oxygen plasma  
 ... rarefied plasmas  
 ... relativistic plasmas  
 ... rotating plasmas  
 ... semiconductor plasmas  
 ... space plasmas  
 ... . solar wind  
 ... . stellar winds  
 ... . dusty plasmas  
 ... . spherical plasmas  
 ... . thermal plasmas  
 ... . toroidal plasmas  
 . . ionized gases  
 . . . Lorentz gas  
 . . magnetically trapped particles  
 . . . radiation belts  
 . . . . artificial radiation belts  
 . . . . inner radiation belt  
 . . . . outer radiation belt  
 . . . . proton belts  
 . . partons  
 . . plasma clouds  
 . . . magnetic clouds  
 . . plasma jets  
 . . . radio jets (astronomy)  
 . . plasma layers  
 . . plasma sheaths  
 . . plasma slabs  
 . . positrons  
 . . protons  
 . . . recoil protons  
 . . . solar protons  
 RT antineutrinos  
 antiparticles  
 bosons  
 charge transfer  
 corpuscular radiation  
 Coulomb collisions  
 Coulomb potential  
 cyclotron frequency  
 cyclotron radiation  
 cyclotron resonance  
 deuteron irradiation  
 electron-positron pairs  
 elementary particles  
 eta-mesons  
 gyrofrequency  
 Helios Project  
 hyperons  
 ion charge  
 kaons  
 leptons  
 Lorentz force  
 meson-nucleon interactions  
 mesons  
 muon spin rotation  
 muons  
 neutral sheets  
 neutrons  
 nonadiabatic theory  
 ∞ nuclei  
 nucleon-nucleon interactions  
 nucleons  
 omega-mesons  
 particle charging  
 particle precipitation  
 particle trajectories  
 pions  
 Reissner-Nordstrom solution  
 rho-mesons  
 sigma-mesons  
 single event upsets  
 trapped particles

∞ **charging**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT battery chargers  
 charge efficiency  
 electric charge  
 electrostatic charge  
 explosive devices  
 explosives  
 filling  
 injection  
 magnetic charge density

SCATHA satellite

**charm (particle physics)**

DEF A quantum number which has been proposed to account for an apparent lack of symmetry in the behavior of hadrons relative to that of leptons, to explain why certain reactions of elementary particles do not occur, and to account for the longevity of the J particle.

RT hadrons  
 leptons  
 particle interactions  
 particle theory  
 ∞ physics  
 quantum theory  
 theoretical physics

**Charon**

DEF Natural satellite of the planet Pluto, discovered and named by Dr. James W. Christy.

GS celestial bodies  
 . natural satellites  
 . . Pluto satellites  
 . . . **Charon**  
 . . trans-Neptunian objects  
 . . **Charon**

RT Callisto  
 Deimos  
 Earth-Moon system  
 Europa  
 Galilean satellites  
 Ganymede  
 Iapetus  
 Io  
 New Horizons mission  
 planetary orbits  
 Pluto (planet)  
 solar system  
 Titan

**Charpy impact test**

GS impact tests  
 . **Charpy impact test**  
 notch tests  
 . **Charpy impact test**  
 RT brittleness  
 drop tests  
 hardness  
 ∞ materials tests  
 notch sensitivity

**charring**

RT ablation  
 carbonization  
 combustion  
 decomposition  
 fire damage  
 oxidation  
 thermal absorption

**charts**

GS **charts**  
 . flow charts  
 . graphs (charts)  
 . . bond graphs  
 . . Gompertz curves  
 . . Mollier diagram  
 . . Patterson map  
 . meteorological charts  
 . nautical charts  
 RT block diagrams  
 diagrams  
 display devices  
 drawings  
 graphic arts  
 maps  
 navigation aids  
 nomographs  
 ∞ plots  
 statistical analysis  
 statistical tests  
 visual aids

**chassignites**

(added August 1991)

DEF Achondritic stony meteorites composed almost entirely (958) of olivine, with accessory amounts of chromite, and lacking nickel-iron. It resembles terrestrial dunite.

GS celestial bodies

## chassis

- . meteorites
- . . . stony meteorites
- . . . . achondrites
- . . . . **chassignites**
- RT nakhilites
- shergottites
- SNC meteorites

### chassis

- GS frames
- . **chassis**
- RT automobiles
- carriages
- ∞ headers
- struts
- supports
- undercarriages

### Chebyshev approximation

- GS analysis (mathematics)
- . numerical analysis
- . . approximation
- . . . **Chebyshev approximation**
- RT series (mathematics)
- statistical analysis

### checkout

- SN (SEQUENCE OF TESTS TO DETERMINE FUNCTIONAL READINESS OF EQUIPMENT)
- DEF A sequence of actions taken to test or examine a thing as to its readiness for incorporation into a new phase of use, or for the performance of its intended function. The sequence of steps taken to familiarize a person with the operation of an airplane or other piece of equipment. Used for debugging.
- UF *debugging*
- RT aircraft maintenance
- CEFOAM checkout equipment
- certification
- cold flow tests
- countdown
- file maintenance (computers)
- inspection
- maintenance
- performance tests
- prefiring tests
- program verification (computers)
- self tests
- space vehicle checkout program
- spacecraft maintenance
- ∞ test equipment
- ∞ tests

### checkout equipment

USE **test equipment**

### chelate compounds

USE **chelates**

### chelates

- UF *chelate compounds*
- RT chelation
- ∞ chemical compounds
- organometallic compounds

### chelation

- RT chelates
- chemical reactions

### chemical analysis

- GS chemical tests
- . **chemical analysis**
- . . chromatography
- . . . gas chromatography
- . . . gel chromatography
- . . . liquid chromatography
- . . . paper chromatography
- . . . thin layer chromatography
- . . electrophotometry
- . . gas analysis
- . . . ozonometry
- . . . Van Slyke method
- . . iodimetry
- . . Karl Fischer reagent
- . . microanalysis
- . . neutron activation analysis
- . . potentiometric analysis
- . . qualitative analysis
- . . quantitative analysis

- . . . Kjeldahl method
- . . . Van Slyke method
- . . spectroscopic analysis
- . . urinalysis
- . . volumetric analysis
- RT alkalinity
- analytical chemistry
- ∞ analyzing
- assaying
- Auger spectroscopy
- chemical detection
- ∞ chemistry
- colorimetry
- coulometers
- density measurement
- diffractometers
- electron probes
- fuel tests
- gas spectroscopy
- gel chromatography
- hydrometers
- hygrometers
- identifying
- inductively coupled plasma mass spectrometry
- infrared spectrophotometers
- infrared spectroscopy
- ion selective electrodes
- isotopic labeling
- laser spectroscopy
- magnetic resonance spectroscopy
- Mars surface samples
- mass spectrometers
- mass spectroscopy
- ∞ materials tests
- ∞ measurement
- metallicity
- methylene blue
- moisture meters
- mutagens
- nephanalysis
- optical measurement
- particle tracks
- particulate sampling
- photometry
- physical chemistry
- polarimeters
- polarography
- psychrometers
- radiochemistry
- reagents
- sampling
- spectral signatures
- spectrometers
- spectrophotometers
- spectroscopy
- ∞ tests
- thermogravimetry
- titrimeters
- x ray analysis

### chemical attack

- GS **chemical attack**
- . intergranular corrosion
- . transgranular corrosion
- RT ∞ attack
- corrosion
- corrosion prevention
- corrosion resistance
- corrosion tests
- degradation
- dissolving
- impregnating
- oxidation
- passivity
- pitting
- rusting
- scale (corrosion)

### chemical auxiliary power units

- GS auxiliary power sources
- . **chemical auxiliary power units**
- RT electric batteries
- fuel cells
- lead acid batteries
- magnesium cells

### chemical bonds

- UF *molecular bonds*
- GS **chemical bonds**

- . covalent bonds
- . hydrogen bonds
- RT active sites (chemistry)
- agglutination
- binding energy
- bonding
- coupled modes
- covalence
- crystal lattices
- ionic crystals
- ligands
- molecules
- monatomic molecules
- octets
- polyatomic molecules
- polywater
- saturation (chemistry)
- Swan bands
- unsaturation (chemistry)
- valence

### chemical cleaning

- GS cleaning
- . **chemical cleaning**
- . . pickling (metallurgy)
- RT descaling
- dissolving

### chemical clouds

- DEF Artificial clouds of chemical compounds released in the ionosphere for observation of dispersion and other characteristics.
- GS clouds (meteorology)
- . artificial clouds
- . . **chemical clouds**
- . . . barium ion clouds
- RT chemical release modules
- CRRES (satellite)
- particles
- plasma clouds

### chemical compatibility

- (added September 1995)
- GS compatibility
- . **chemical compatibility**
- RT affinity
- liquid rocket propellants
- metal matrix composites
- propellant tests
- stability

### chemical composition

- GS composition (property)
- . **chemical composition**
- . . carbon dioxide concentration
- . . stellar composition
- RT alkalinity
- atmospheric composition
- atom concentration
- body composition (biology)
- distribution (property)
- gas composition
- ionospheric composition
- ligands
- metallic stars
- metallicity
- planetary structure
- spectral signatures

### ∞ chemical compounds

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF Distinct substances formed by a union of two or more ingredients in definite proportions by weight.
- RT acetyl compounds
- actinide series compounds
- adducts
- ∞ alkali metal compounds
- ∞ alkaline earth compounds
- alkyl compounds
- allyl compounds
- aluminum compounds
- amines
- ammonium compounds
- antimony compounds
- ∞ aromatic compounds
- arsenic compounds
- azo compounds

- barium compounds
- beryllium compounds
- bismuth compounds
- boron compounds
- boron-epoxy composites
- bromine compounds
- cadmium compounds
- calcium compounds
- carbon compounds
- carbonyl compounds
- cerium compounds
- cesium compounds
- cetyl compounds
- chelates
- ∞ chemicals
- chlorine compounds
- chromium compounds
- clathrates
- cobalt compounds
- complex compounds
- compound A
- ∞ compounds
- congeners
- copper compounds
- curium compounds
- cyano compounds
- cyclic compounds
- deuterium compounds
- diallyl compounds
- dibasic compounds
- dibutyl compounds
- difluoro compounds
- diphenyl compounds
- dopa
- dysprosium compounds
- epoxy compounds
- erbium compounds
- ethyl compounds
- ethylene compounds
- europium compounds
- fluorine compounds
- fluorine organic compounds
- fluoro compounds
- fullerides
- furans
- gallium compounds
- germanium compounds
- ∞ Group 1B compounds
- ∞ Group 2B compounds
- ∞ Group 3A compounds
- ∞ Group 3B compounds
- ∞ Group 4A compounds
- ∞ Group 4B compounds
- ∞ Group 5A compounds
- ∞ Group 5B compounds
- ∞ Group 6A compounds
- ∞ Group 6B compounds
- ∞ Group 7B compounds
- ∞ Group 8 compounds
- hafnium compounds
- halocarbons
- halogen compounds
- heterocyclic compounds
- hexyl compounds
- hydrazinium compounds
- hydrazonium compounds
- hydrogen compounds
- hydroxyl compounds
- indium aluminum arsenides
- indium compounds
- indium oxides
- inorganic compounds
- intercalation
- iodine compounds
- iridium compounds
- iron compounds
- isopropyl compounds
- lanthanum compounds
- lead compounds
- lead organic compounds
- lithium compounds
- lutetium compounds
- magnesium compounds
- manganese compounds
- mercury compounds
- ∞ metal compounds
- methoxy systems
- methyl compounds
- molecules
- molybdenum compounds
- monatomic molecules
- neodymium compounds
- neptunium compounds
- nickel compounds
- niobium compounds
- nitro compounds
- nitrogen compounds
- nitronium compounds
- nitroso compounds
- organic aluminum compounds
- organic boron compounds
- organic compounds
- organic germanium compounds
- organic lithium compounds
- organic phosphorus compounds
- organic semiconductors
- organic silicon compounds
- organic sulfur compounds
- organic tin compounds
- organometallic compounds
- osmium compounds
- ∞ oxygen compounds
- oxynitrides
- palladium compounds
- phosgene
- phosphonium compounds
- phosphorus compounds
- platinum compounds
- plutonium compounds
- polonium compounds
- polyatomic molecules
- polynuclear organic compounds
- polyquinoxalines
- potassium compounds
- praseodymium compounds
- propyl compounds
- protactinium compounds
- rare earth compounds
- ∞ rare gas compounds
- refractory materials
- rhenium compounds
- rhodium compounds
- rubidium compounds
- ruthenium compounds
- samarium compounds
- scandium compounds
- selenium compounds
- silicon compounds
- silver compounds
- sodium compounds
- strontium compounds
- strontium oxides
- styphnates
- sulfur compounds
- sulfur hexafluoride
- tantalum compounds
- technetium compounds
- tellurium compounds
- tetrahydrofuran
- thiols
- thorium compounds
- thulium compounds
- tin compounds
- titanium compounds
- triethyl compounds
- trimethyl compounds
- trinitro compounds
- tropyl compounds
- tungsten compounds
- uranium compounds
- vanadium compounds
- vanadyl compounds
- Wiswesser notations
- xenon compounds
- ytterbium compounds
- yttrium compounds
- zinc compounds
- zirconium compounds
- zwitterions
- first aid
- injuries
- masks
- neurology
- physiological factors
- protective clothing
- safety devices
- warfare
- chemical detection**
- (added April 2004)
- DEF Sensing and identification of chemical compounds within a particular environment.
- GS detection
- . **chemical detection**
- . . explosives detection
- RT chemical analysis
- chemical defense
- chemical tests
- lab-on-a-chip devices
- chemical effects**
- RT biological effects
- ∞ effects
- sterilization effects
- temperature effects
- chemical elements**
- GS **chemical elements**
- . actinide series
- . . actinium
- . . . radium
- . . . . radium isotopes
- . . . . . radium 226
- . . . . . thorium
- . . . . . thorium isotopes
- . . . . . transuranium elements
- . . . . . americium
- . . . . . americium isotopes
- . . . . . . americium 241
- . . . . . . berkelium
- . . . . . . californium
- . . . . . . californium isotopes
- . . . . . . curium
- . . . . . . curium isotopes
- . . . . . . . curium 242
- . . . . . . . curium 244
- . . . . . . . einsteinium
- . . . . . . . fermium
- . . . . . . . lawrencium
- . . . . . . . mendelevium
- . . . . . . . neptunium
- . . . . . . . neptunium isotopes
- . . . . . . . nobelium
- . . . . . . . plutonium
- . . . . . . . plutonium isotopes
- . . . . . . . . plutonium 238
- . . . . . . . . plutonium 239
- . . . . . . . . plutonium 240
- . . . . . . . . plutonium 241
- . . . . . . . . plutonium 244
- . . . . . . . . sergenium
- . . . . . . . . uranium
- . . . . . . . . uranium isotopes
- . . . . . . . . . uranium 232
- . . . . . . . . . uranium 233
- . . . . . . . . . uranium 234
- . . . . . . . . . uranium 235
- . . . . . . . . . uranium 238
- . . . . . . . . . alkali metals
- . . . . . . . . . cesium
- . . . . . . . . . cesium isotopes
- . . . . . . . . . . cesium 133
- . . . . . . . . . . cesium 134
- . . . . . . . . . . cesium 137
- . . . . . . . . . . cesium 144
- . . . . . . . . . . cesium vapor
- . . . . . . . . . . francium
- . . . . . . . . . . lithium
- . . . . . . . . . . . liquid lithium
- . . . . . . . . . . . lithium isotopes
- . . . . . . . . . . . potassium
- . . . . . . . . . . . . liquid potassium
- . . . . . . . . . . . . potassium isotopes
- . . . . . . . . . . . . . potassium 38
- . . . . . . . . . . . . . potassium 39
- . . . . . . . . . . . . . potassium 40
- . . . . . . . . . . . . . rubidium
- . . . . . . . . . . . . . rubidium isotopes
- . . . . . . . . . . . . . . rubidium 86
- chemical defense**
- DEF All actions and counteractions designed for the protection of personnel and material against offensive chemical agents.
- RT chemical detection
- civil defense
- clothing
- drugs

## chemical elements

- . . sodium
- . . . liquid sodium
- . . . sodium isotopes
- . . . . sodium 22
- . . . . sodium 24
- . . . sodium vapor
- . alkaline earth metals
- . . barium isotopes
- . aluminum
- . . aluminum isotopes
- . . . aluminum 26
- . . . aluminum 27
- . barium
- . . barium isotopes
- . beryllium
- . . beryllium isotopes
- . . . beryllium 7
- . . . beryllium 9
- . . . beryllium 10
- . bismuth
- . . bismuth isotopes
- . cadmium
- . . cadmium isotopes
- . calcium
- . . calcium isotopes
- . carbon
- . . carbon isotopes
- . . . carbon 12
- . . . carbon 13
- . . . carbon 14
- . chromium
- . . chromium isotopes
- . cobalt
- . . cobalt isotopes
- . . . cobalt 58
- . . . cobalt 60
- . copper
- . . copper isotopes
- . gallium
- . . gallium isotopes
- . gold
- . . gold isotopes
- . . . gold 198
- . hafnium
- . . hafnium isotopes
- . hahnium
- . halogens
- . . astatine
- . . bromine
- . . . bromine isotopes
- . . chlorine
- . . fluorine
- . . . fluorine isotopes
- . . liquid fluorine
- . . iodine
- . . . iodine isotopes
- . . . . iodine 125
- . . . . iodine 131
- . . . . iodine 132
- . heavy elements
- . hydrogen
- . . hydrogen isotopes
- . . . deuterium
- . . . hydrogen 4
- . . . metallic hydrogen
- . . . tritium
- . . liquid hydrogen
- . indium
- . iridium
- . . iridium isotopes
- . iron
- . . iron isotopes
- . . . iron 57
- . . . iron 58
- . . . iron 59
- . lead (metal)
- . . lead isotopes
- . light elements
- . magnesium
- . . magnesium isotopes
- . manganese
- . . manganese isotopes
- . mercury (metal)
- . . mercury isotopes
- . . mercury vapor
- . metalloids
- . . antimony
- . . antimony isotopes
- . . arsenic
- . . . arsenic isotopes
- . boron
- . . boron isotopes
- . . . boron 10
- . germanium
- . . germanium isotopes
- . polonium
- . . polonium isotopes
- . . . polonium 208
- . . . polonium 209
- . . . polonium 210
- . silicon
- . . amorphous silicon
- . . porous silicon
- . . silicon isotopes
- . tellurium
- . . tellurium isotopes
- . molybdenum
- . nickel
- . . nickel isotopes
- . niobium
- . . niobium isotopes
- . . . niobium 95
- . nitrogen
- . . liquid nitrogen
- . . nitrogen isotopes
- . . . nitrogen 15
- . . . nitrogen 16
- . . . solid nitrogen
- . nuclides
- . . isotopes
- . . . aluminum isotopes
- . . . . aluminum 26
- . . . . aluminum 27
- . . . antimony isotopes
- . . . argon isotopes
- . . . arsenic isotopes
- . . . barium isotopes
- . . . beryllium isotopes
- . . . . beryllium 7
- . . . . beryllium 9
- . . . . beryllium 10
- . . . bismuth isotopes
- . . . boron isotopes
- . . . . boron 10
- . . . bromine isotopes
- . . . cadmium isotopes
- . . . calcium isotopes
- . . . carbon isotopes
- . . . . carbon 12
- . . . . carbon 13
- . . . . carbon 14
- . . . cerium isotopes
- . . . . cerium 137
- . . . . cerium 144
- . . . cesium isotopes
- . . . . cesium 133
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- . . . cesium vapor
- . . . chromium isotopes
- . . . cobalt isotopes
- . . . . cobalt 58
- . . . . cobalt 60
- . . . dysprosium isotopes
- . . . erbium isotopes
- . . . europium isotopes
- . . . fluorine isotopes
- . . . gadolinium isotopes
- . . . gallium isotopes
- . . . germanium isotopes
- . . . gold isotopes
- . . . . gold 198
- . . . hafnium isotopes
- . . . helium isotopes
- . . . holmium isotopes
- . . . hydrogen isotopes
- . . . . deuterium
- . . . . hydrogen 4
- . . . . metallic hydrogen
- . . . . tritium
- . . . iodine isotopes
- . . . . iodine 125
- . . . . iodine 131
- . . . . iodine 132
- . . . iridium isotopes
- . . . iron isotopes
- . . . . iron 57
- . . . iron 58
- . . . iron 59
- . . . krypton isotopes
- . . . . krypton 85
- . . . lanthanum isotopes
- . . . lead isotopes
- . . . lithium isotopes
- . . . lutetium
- . . . lutetium isotopes
- . . . magnesium isotopes
- . . . manganese isotopes
- . . . mercury isotopes
- . . . molybdenum isotopes
- . . . neodymium isotopes
- . . . neon isotopes
- . . . nickel isotopes
- . . . niobium isotopes
- . . . . niobium 95
- . . . nitrogen isotopes
- . . . . nitrogen 15
- . . . . nitrogen 16
- . . . nobelium isotopes
- . . . osmium isotopes
- . . . oxygen isotopes
- . . . . oxygen 17
- . . . . oxygen 18
- . . . palladium isotopes
- . . . phosphorus isotopes
- . . . . phosphorus 32
- . . . platinum isotopes
- . . . polonium isotopes
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- . . . potassium isotopes
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- . . . praseodymium isotopes
- . . . promethium isotopes
- . . . protactinium isotopes
- . . . radioactive isotopes
- . . . . astatine isotopes
- . . . . beryllium 7
- . . . . beryllium 9
- . . . . beryllium 10
- . . . . carbon 14
- . . . . cerium 137
- . . . . cerium 144
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- . . . . cobalt 58
- . . . . cobalt 60
- . . . . copper isotopes
- . . . . gold 198
- . . . . indium isotopes
- . . . . iodine 125
- . . . . iodine 131
- . . . . iodine 132
- . . . . iron 59
- . . . . krypton 85
- . . . . niobium 95
- . . . . nitrogen 16
- . . . . phosphorus 32
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- . . . . potassium 38
- . . . . potassium 40
- . . . . rubidium 86
- . . . . sodium 22
- . . . . sodium 24
- . . . . strontium 85
- . . . . strontium 88
- . . . . strontium 89
- . . . . strontium 90
- . . . . transuranium elements
- . . . . . americium
- . . . . . americium isotopes
- . . . . . . americium 241
- . . . . . berkelium
- . . . . . californium
- . . . . . californium isotopes
- . . . . . curium
- . . . . . curium isotopes
- . . . . . . curium 242
- . . . . . . curium 244
- . . . . . einsteinium

. . . . fermium  
 . . . . lawrencium  
 . . . . mendeleevium  
 . . . . neptunium  
 . . . . . neptunium isotopes  
 . . . . nobelium  
 . . . . plutonium  
 . . . . . plutonium isotopes  
 . . . . . plutonium 238  
 . . . . . plutonium 239  
 . . . . . plutonium 240  
 . . . . . plutonium 241  
 . . . . . plutonium 244  
 . . . . sergenium  
 . . . . tritium  
 . . . . uranium 232  
 . . . . uranium 233  
 . . . . uranium 238  
 . . . . xenon 133  
 . . . . xenon 135  
 . . . . zirconium 95  
 . . . . radium isotopes  
 . . . . radium 226  
 . . . . radon isotopes  
 . . . . rhenium isotopes  
 . . . . rhodium isotopes  
 . . . . rubidium isotopes  
 . . . . rubidium 86  
 . . . . ruthenium isotopes  
 . . . . samarium isotopes  
 . . . . scandium isotopes  
 . . . . selenium isotopes  
 . . . . silicon isotopes  
 . . . . silver isotopes  
 . . . . sodium isotopes  
 . . . . sodium 22  
 . . . . sodium 24  
 . . . . strontium isotopes  
 . . . . strontium 85  
 . . . . strontium 87  
 . . . . strontium 89  
 . . . . strontium 90  
 . . . . sulfur isotopes  
 . . . . tantalum isotopes  
 . . . . technetium isotopes  
 . . . . tellurium  
 . . . . tellurium isotopes  
 . . . . terbium isotopes  
 . . . . thallium isotopes  
 . . . . thorium isotopes  
 . . . . thulium isotopes  
 . . . . tin isotopes  
 . . . . titanium isotopes  
 . . . . tungsten isotopes  
 . . . . uranium isotopes  
 . . . . uranium 232  
 . . . . uranium 233  
 . . . . uranium 234  
 . . . . uranium 235  
 . . . . uranium 238  
 . . . . vanadium isotopes  
 . . . . xenon isotopes  
 . . . . xenon 129  
 . . . . xenon 133  
 . . . . xenon 135  
 . . . . ytterbium isotopes  
 . . . . yttrium isotopes  
 . . . . zinc isotopes  
 . . . . zirconium isotopes  
 . . . . zirconium 95  
 . osmium  
 . . osmium isotopes  
 . oxygen  
 . . liquid oxygen  
 . . oxygen isotopes  
 . . . oxygen 17  
 . . . oxygen 18  
 . palladium  
 . phosphorus  
 . . phosphorus isotopes  
 . . . phosphorus 32  
 . platinum  
 . . platinum isotopes  
 . protactinium  
 . . protactinium isotopes  
 . rare earth elements  
 . . cerium  
 . . . cerium isotopes  
 . . . cerium 137  
 . . . cerium 144  
 . . . dysprosium  
 . . . dysprosium isotopes  
 . . . erbium  
 . . . erbium isotopes  
 . . . europium  
 . . . europium isotopes  
 . . . gadolinium  
 . . . gadolinium isotopes  
 . . . holmium  
 . . . holmium isotopes  
 . . . lanthanum  
 . . . lanthanum isotopes  
 . . . lutetium  
 . . . lutetium isotopes  
 . . . neodymium  
 . . . neodymium isotopes  
 . . . praseodymium  
 . . . praseodymium isotopes  
 . . . promethium  
 . . . promethium isotopes  
 . . . samarium  
 . . . samarium isotopes  
 . . . scandium  
 . . . scandium isotopes  
 . . . terbium  
 . . . terbium isotopes  
 . . . thulium  
 . . . thulium isotopes  
 . . . ytterbium  
 . . . ytterbium isotopes  
 . . . yttrium  
 . . . yttrium isotopes  
 . rare gases  
 . . argon  
 . . . argon isotopes  
 . . helium  
 . . . helium isotopes  
 . . . liquid helium  
 . . . . liquid helium 2  
 . . krypton  
 . . . krypton isotopes  
 . . . . krypton 85  
 . . neon  
 . . . liquid neon  
 . . . neon isotopes  
 . . radon  
 . . . radon isotopes  
 . . xenon  
 . . . xenon isotopes  
 . . . . xenon 129  
 . . . . xenon 133  
 . . . . xenon 135  
 . rhenium  
 . . rhenium isotopes  
 . rhodium  
 . . rhodium isotopes  
 . ruthenium  
 . . ruthenium isotopes  
 . rutherfordium  
 . selenium  
 . silver  
 . . silver isotopes  
 . strontium  
 . . strontium isotopes  
 . . . strontium 85  
 . . . strontium 87  
 . . . strontium 89  
 . . . strontium 90  
 . sulfur  
 . . sulfur isotopes  
 . tantalum  
 . . tantalum isotopes  
 . technetium  
 . thallium  
 . . thallium isotopes  
 . tin  
 . . tin isotopes  
 . titanium  
 . . titanium isotopes  
 . tungsten  
 . . vanadium  
 . . vanadium isotopes  
 . zinc  
 . . zinc isotopes  
 . zirconium  
 . . zirconium isotopes  
 . . . zirconium 95  
 . bohrium

. dubnium  
 . hassium  
 . meitnerium  
 . seaborgium  
 . siderophile elements  
 RT atoms  
 ∞ chemicals  
 ∞ elements  
 ferrous metals  
 ions  
 isotopic enrichment  
 light ions  
 metals  
 nonferrous metals  
 nuclear isobars  
 plasmas (physics)  
 trace contaminants

**chemical energy**

DEF Energy produced or absorbed in the process of a chemical reaction. In any such a reaction, energy losses or gains usually involve only the outermost electrons of the atoms or ions of the system undergoing change; here a chemical bond of some type is established or broken without disrupting the original atomic or ionic identities of the constituents.

GS **chemical energy**

. energy of formation

RT ∞ energy

free energy  
 internal energy  
 kinetic energy  
 ∞ level  
 molecular energy levels  
 ∞ nuclear energy  
 potential energy

**chemical engineering**

RT aerothermochemistry

∞ chemistry  
 combustion chemistry  
 cracking (chemical engineering)  
 diffusion  
 ∞ engineering  
 fluid flow  
 furnaces  
 heat transfer  
 materials handling  
 ∞ operations  
 thermochemistry

**chemical equilibrium**

UF *Chapman-Jouget flame*  
*chemical shift*

GS **chemical equilibrium**

. acid base equilibrium

RT association reactions

buffers (chemistry)  
 dissociation  
 ∞ equilibrium  
 heat of dissociation  
 phase rule  
 reaction kinetics  
 thermodynamic equilibrium

**chemical evolution**

DEF The theory of the creation or production of living matter from nonliving matter.

GS evolution (development)

. **chemical evolution**

RT abiogenesis  
 biological evolution  
 ∞ evolution  
 exobiology  
 life sciences  
 organic compounds  
 protein synthesis  
 protobiology  
 self assembly

**chemical explosions**

GS explosions

. **chemical explosions**  
 . . gas explosions  
 . . propellant explosions

RT

aerial explosions  
 combustion  
 detonable gas mixtures  
 detonation



## chemical fractionation

explosives  
flammable gases  
turbulent combustion  
underground explosions  
underwater explosions

### chemical extinguishers

USE **fire extinguishers**

### chemical fractionation

GS fractionation  
. **chemical fractionation**

RT distillation  
refining  
∞ separation

### chemical fuels

DEF Fuels that depend upon an oxidizer for combustion or for development of thrust, such as liquid or solid rocket fuel or internal combustion engine fuel; distinguished from nuclear fuel.

GS fuels  
. **chemical fuels**  
.. endothermic fuels  
.. high energy fuels  
.. hydrocarbon fuels  
... diesel fuels  
... fossil fuels  
... coal  
... anthracite  
... lignite  
... solvent refined coal  
... crude oil  
... natural gas  
... liquefied natural gas  
... peat  
... shale oil  
... gasoline  
... jet engine fuels  
... JP-4 jet fuel  
... JP-5 jet fuel  
... JP-6 jet fuel  
... JP-7 jet fuel  
... JP-8 jet fuel  
... synthane  
... liquid fuels  
... antimisting fuels  
... diesel fuels  
... gasoline  
... hydrogen fuels  
... jet engine fuels  
... JP-4 jet fuel  
... JP-5 jet fuel  
... JP-6 jet fuel  
... JP-7 jet fuel  
... JP-8 jet fuel  
... fuel oils  
... kerosene  
... metal fuels  
... synthetic fuels  
... gasohol (fuel)  
... synthane

RT clean fuels  
explosives  
fuel production  
gelled propellants  
gelled rocket propellants  
hybrid propellants  
monopropellants  
plastic propellants  
propellants  
pyrotechnics  
solid propellants

### chemical indicators

RT biomarkers  
∞ indicators  
methylene blue  
phloroglucinol

### chemical kinetics

USE **reaction kinetics**

### chemical lasers

GS stimulated emission devices  
. lasers  
.. **chemical lasers**  
... HCL lasers  
... HCL argon lasers  
... chemical oxygen-iodine lasers

RT argon lasers  
carbon dioxide lasers  
carbon lasers  
carbon monoxide lasers  
chain reactions (chemistry)  
gas lasers  
HCN lasers  
HF lasers  
infrared lasers  
liquid lasers  
organic lasers  
Q switched lasers  
TEA lasers  
tube lasers

### chemical machining

UF *chemical milling*  
GS machining  
. **chemical machining**  
.. electrochemical machining  
RT milling (machining)

### chemical milling

USE **chemical machining**

### chemical oxygen-iodine lasers

(added August 1997)  
UF *COIL (lasers)*  
GS stimulated emission devices  
. lasers  
.. chemical lasers  
... **chemical oxygen-iodine lasers**  
... iodine lasers  
... **chemical oxygen-iodine lasers**  
RT continuous wave lasers

### chemical properties

GS **chemical properties**  
. acidity  
. salinity  
. thermochemical properties  
.. heat of combustion  
.. heat of dissociation  
.. heat of formation  
.. heat of solution  
.. latent heat  
.. heat of fusion  
.. heat of vaporization  
RT adsorptivity  
∞ high resistance  
hydrophobicity  
hygroscopicity  
∞ low resistance  
moisture content  
passivity  
∞ physical properties  
propellant properties  
∞ properties  
∞ resistance  
thermodynamic properties  
toxicity  
toxicity and safety hazard

### chemical propulsion

UF *chemonuclear propulsion*  
GS propulsion  
. **chemical propulsion**  
.. hybrid propulsion  
RT jet propulsion  
marine propulsion  
spacecraft propulsion  
underwater propulsion

### chemical reaction control

RT agitation  
∞ control  
∞ reaction control  
temperature control

### chemical reactions

UF *flame interaction*  
GS **chemical reactions**  
. acylation  
.. acetylation  
.. alkylation  
.. ammonolysis  
.. association reactions  
.. atomic recombination  
.. oxygen recombination  
.. carbonization

. carboxylation  
. copolymerization  
. cracking (chemical engineering)  
.. hydrocracking  
.. pyrolysis  
. decarbonation  
. decarboxylation  
. defluorination  
. dehydrogenation  
. deionization  
. denitrogenation  
. depolymerization  
. desulfurizing  
. endothermic reactions  
. epoxidation  
. exothermic reactions  
. fermentation  
. Friedel-Craft reaction  
. glycolysis  
. Grignard reactions  
. halogenation  
.. bromination  
.. chlorination  
.. fluorination  
. hydroboration  
. hydrogenolysis  
.. hydrocracking  
. hydrolysis  
. ion recombination  
. metal-water reactions  
. metathesis  
. methanation  
. methylation  
. Michael reaction  
. nitration  
. nitriding  
. nitrogenation  
. nitrolysis  
. oxidation  
.. electrochemical oxidation  
.. photooxidation  
.. rusting  
. oxidation-reduction reactions  
. oxygenation  
. phosphorylation  
. photochemical reactions  
.. photochromism  
.. photodecomposition  
.. photolysis  
.. photooxidation  
.. photosynthesis  
.. radiolysis  
. pyrohydrolysis  
. reduction (chemistry)  
.. deoxidizing  
.. hydrogenation  
. Sabatier reaction  
. sulfation  
. sulfidation  
. thermal decomposition  
.. pyrolysis  
. cycloaddition  
. thermal dissociation  
. titration  
.. Diels-Alder reactions  
. chain reactions (chemistry)

RT biosynthesis  
chelation  
combustion chemistry  
corrosion  
gas-metal interactions  
hydration  
interstellar chemistry  
∞ operations  
particle interactions  
plasma jet synthesis  
polymerization  
radiochemical separation  
reacting flow  
∞ reaction  
reaction bonding  
reaction intermediates  
reaction kinetics  
reactivity  
reagents  
sodalite  
solvation  
stoichiometry  
surface reactions

- ∞ synthesis
  - synthesis (chemistry)
  - synthetic fuels
  - thermochemistry
- chemical reactors**
  - RT autoclaves
  - beds (process engineering)
  - burners
  - columns (process engineering)
  - contactors
  - fluidized bed processors
  - furnaces
  - gas generators
  - ∞ gas reactors
    - reactor design
    - reactor materials
    - reactor safety
  - ∞ reactors
    - synthesizers
    - tanks (containers)
    - water cooled reactors
- chemical relaxation*
  - USE **molecular relaxation**
- chemical release modules**
  - DEF Shuttle launched, free-flying spacecraft containing canisters for injecting chemicals into the upper atmosphere and the measurement of the reactions.
  - GS modules
    - . **chemical release modules**
  - RT chemical clouds
    - CRRES (satellite)
    - dispersing
- chemical shift*
  - USE **chemical equilibrium**
- chemical sterilization**
  - GS cleaning
    - . sterilization
    - . . **chemical sterilization**
  - RT antiseptics
    - bactericides
    - ethylene oxide
    - purification
    - sewage treatment
    - spacecraft sterilization
- chemical tests**
  - GS **chemical tests**
    - . chemical analysis
    - . . chromatography
      - . . . gas chromatography
      - . . . gel chromatography
      - . . . liquid chromatography
      - . . . paper chromatography
      - . . . thin layer chromatography
    - . . electrophotometry
    - . . gas analysis
    - . . . ozonometry
    - . . . Van Slyke method
    - . . iodimetry
    - . . Karl Fischer reagent
    - . . microanalysis
    - . . neutron activation analysis
    - . . potentiometric analysis
    - . . qualitative analysis
    - . . quantitative analysis
    - . . . Kjeldahl method
    - . . . Van Slyke method
    - . . spectroscopic analysis
    - . . urinalysis
    - . . volumetric analysis
    - . . salt spray tests
  - RT chemical detection
    - corrosion resistance
    - gas spectroscopy
    - high temperature tests
    - inspection
    - low temperature tests
    - nondestructive tests
    - quality control
    - sampling
    - staining
- ∞ tests
  - chemical vapor deposition*
    - USE **vapor deposition**
  - chemical vapor infiltration**
    - (added December 1992)
    - UF *CVI (fabrication)*
    - GS infiltration
      - . **chemical vapor infiltration**
    - RT carbon fibers
      - ceramic fibers
      - ceramic matrix composites
      - composite materials
      - densification
      - fiber composites
  - chemical warfare**
    - GS warfare
      - . **chemical warfare**
    - RT biochemistry
      - biological weapons
      - physiological factors
  - chemically reacting flow*
    - USE **reacting flow**
  - ∞ **chemicals**
    - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
    - RT ∞ chemical compounds
      - chemical elements
  - chemiluminescence**
    - DEF Any luminescence produced by chemical action.
    - GS emission
      - . light emission
      - . . luminescence
      - . . . **chemiluminescence**
    - RT airglow
      - phosphorescence
  - chemisorption**
    - DEF The binding of a liquid or gas on the surface or in the interior of a solid by chemical bonds or forces.
    - GS sorption
      - . adsorption
      - . . **chemisorption**
    - RT adatoms
      - adsorptivity
      - atomic clusters
      - gas-metal interactions
      - hydrogen embrittlement
      - masking
      - metal clusters
      - molecular clusters
  - ∞ **chemistry**
    - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
    - DEF The science that studies the composition, structure, properties, interactions, and transformations of elemental matter and compounds.
    - RT aerothermochemistry
      - aerothermodynamics
      - analytical chemistry
      - atmospheric chemistry
      - biochemistry
      - biogeochemistry
      - chemical analysis
      - chemical engineering
      - chemotherapy
      - combustion chemistry
      - computational chemistry
      - cosmochemistry
      - cryochemistry
      - electrochemistry
      - environmental chemistry
      - geochemistry
      - hydroxyl radicals
      - inorganic chemistry
      - interstellar chemistry
      - marine chemistry
      - nuclear chemistry
      - organic chemistry
      - photoelectrochemistry
  - physical chemistry
  - ∞ physical sciences
    - Physics and Chemistry Experiment in Space
    - physiochemistry
    - plasma chemistry
    - polymer chemistry
    - precipitation (chemistry)
    - propellant chemistry
    - quantum chemistry
    - radiation chemistry
    - radiochemistry
    - reduction (chemistry)
    - saturation (chemistry)
    - stereochemistry
    - stoichiometry
    - synthesis (chemistry)
    - thermochemistry
    - unsaturation (chemistry)
    - Wiswesser notations
  - chemonuclear propulsion*
    - USE **chemical propulsion**
    - nuclear propulsion**
  - chemoreceptors**
    - GS anatomy
      - . sense organs
      - . . **chemoreceptors**
      - . . . receptors (physiology)
      - . . . **chemoreceptors**
    - RT carotid sinus body
      - olfactory perception
      - taste
  - chemosphere**
    - DEF The vaguely defined region of the upper atmosphere in which photochemical reactions take place. It is generally considered to include the stratosphere (or the top thereof) and the mesosphere, and sometimes the lower part of the thermosphere.
    - GS Earth atmosphere
      - . **chemosphere**
    - RT biosphere
      - Earth ionosphere
      - heterosphere
      - homosphere
      - lower atmosphere
      - mesosphere
      - middle atmosphere
      - ozonosphere
      - plasmaphere
      - stratosphere
      - thermosphere
      - troposphere
      - upper atmosphere
  - chemotherapeutic agents*
    - (added April 2004)
    - USE **drugs**
  - chemotherapy**
    - UF *drug therapy*
    - GS therapy
      - . **chemotherapy**
    - RT antiseptics
      - ∞ chemistry
      - drugs
  - Chena River Basin (AK)**
    - GS landforms
      - . structural basins
      - . . river basins
      - . . . **Chena River Basin (AK)**
    - RT Alaska
  - Chesapeake Bay (US)**
    - GS bays (topographic features)
      - . **Chesapeake Bay (US)**
    - RT estuaries
      - Maryland
      - river basins
      - sounds (topographic features)
      - Virginia
  - chest**
    - GS anatomy
      - . **chest**
      - . . breast

## chiasms

... mammary glands  
 RT thorax  
 torso

*chewing*  
 USE **mastication**

**chiasms**  
 GS crossings  
 . **chiasms**

**chickens**  
 GS animals  
 . vertebrates  
 . . birds  
 . . . **chickens**

**child device**  
 RT learning  
 learning theory  
 training devices

**Child-Langmuir law**  
 GS laws  
 . **Child-Langmuir law**  
 RT perveance  
 space charge  
 thermionic diodes

**children**  
 RT adults  
 females  
 human beings  
 males  
 parents  
 progeny

**Chile**  
 GS nations  
 . **Chile**  
 RT European Southern Observatory  
 South America

*chilling*  
 USE **cooling**

*chimes*  
 USE **auditory signals**

**chimneys**  
 RT buildings  
 exhaust systems  
 flues  
 furnaces  
 plumes  
 stacks  
 vents  
 waste energy utilization

**chimpanzees**  
 GS animals  
 . vertebrates  
 . . mammals  
 . . . primates  
 . . . . apes  
 . . . . . **chimpanzees**  
 RT human beings

**chin**  
 GS anatomy  
 . face (anatomy)  
 . . **chin**  
 RT bones  
 head (anatomy)

**China**  
 UF *China (communist) mainland*  
*Chinese Peoples Republic*  
 GS nations  
 . **China**  
 RT Asia  
 Chinese aircraft  
 Chinese space program  
 Chinese spacecraft  
 Hong Kong

Taiwan

*China (communist) mainland*  
 USE **China**

**Chinese aircraft**  
 RT ∞ aircraft  
 China

*Chinese Peoples Republic*  
 USE **China**

**Chinese space program**  
 GS programs  
 . space programs  
 . . **Chinese space program**  
 RT China  
 Long March launch vehicles  
 ∞ research projects  
 Shenzhou 5 spacecraft  
 space missions  
 Taiwan

**Chinese spacecraft**  
 DEF Spacecraft built and launched by the Chinese Peoples Republic.  
 GS **Chinese spacecraft**  
 . Shenzhou 5 spacecraft  
 RT China  
 Long March launch vehicles  
 ∞ spacecraft  
 Taiwan

*chinone*  
 USE **quinones**

*Chinook helicopter*  
 USE **CH-47 helicopter**

**chipping**  
 RT abrasion  
 comminution  
 cutting  
 flaking  
 fracturing  
 fragmentation  
 pitting  
 ∞ separation  
 spalling  
 splitting  
 wear

**chips**  
 RT chips (electronics)  
 fragments  
 scrap

**chips (electronics)**  
 DEF Integrated microcircuits mounted on substrates and performing significant numbers of functions.  
 GS **chips (electronics)**  
 . chips (memory devices)  
 . lab-on-a-chip devices  
 . systems-on-a-chip  
 RT application specific integrated circuits  
 central processing units  
 chips  
 computer design  
 integrated circuits  
 large scale integration  
 microelectronics  
 microprocessors  
 reconfigurable hardware  
 RISC processors  
 systolic arrays  
 very large scale integration  
 VHSIC (circuits)

**chips (memory devices)**  
 DEF Integrated microcircuit devices used collectively to perform the functions of data storage: accepting, retaining, and emitting bits of data.  
 GS chips (electronics)  
 . **chips (memory devices)**  
 . computer components  
 . **chips (memory devices)**  
 RT carbon nanotube based memory  
 ∞ devices  
 integrated circuits

memory (computers)  
 metal-nitride-oxide-semiconductors  
 semiconductor devices

**chiral dynamics**  
 RT chirality  
 ∞ dynamics  
 group theory  
 Lagrange multipliers  
 matrices (mathematics)

**chirality**  
*(added August 1994)*  
 GS symmetry  
 . **chirality**  
 RT antisymmetry  
 chiral dynamics  
 enantiomers  
 group theory  
 handedness

**Chiron**  
 DEF Minor planet 2060, a solar system asteroid discovered by Charles T. Kowal of Hale Observatories. Used for Minor Planet 2060.  
 UF *Minor Planet 2060*  
 GS celestial bodies  
 . asteroids  
 . . **Chiron**  
 RT Apollo asteroids  
 asteroid belts  
 meteoroids  
 planets  
 solar system  
 space debris

**chironomus flies**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **chironomus flies**  
 RT *Drosophila*  
 infestation

**chirp**  
 DEF An all encompassing term for the various techniques of pulse expansion-pulse compression applied to pulse radar; a technique to expand narrow pulses to wide pulses for transmission, and compress wide received pulses to the original narrow pulse width and wave shape, to gain improvement in signal-to-noise ratio without degradation to range resolution and range discrimination.  
 GS electromagnetic interference  
 . radio frequency interference  
 . . **chirp**  
 . . . chirp signals

**chirp signals**  
 GS electromagnetic interference  
 . radio frequency interference  
 . . chirp  
 . . . **chirp signals**  
 RT electromagnetic noise  
 ∞ signals

**chitin**  
 SN (A POLYSACCHARIDE WHICH IS THE PRINCIPAL CONSTITUENT OF THE SHELLS OF CRABS AND LOBSTERS, THE SHARDS OF BEETLES, AND IS ALSO FOUND IN CERTAIN FUNGI)  
 DEF A polysaccharide which is the principal constituent of the shells of crabs and lobsters and of the shards of beetles. It is also found in certain fungi.  
 GS biopolymers  
 . polysaccharides  
 . . **chitin**  
 . organic compounds  
 . carbohydrates  
 . . polysaccharides  
 . . . **chitin**  
 RT gums (substances)  
 starches

**chloral**  
 GS aldehydes

- . chloral
- chlorates**
  - GS halogen compounds
  - . chlorine compounds
  - . . chlorates
  - RT  $\infty$  oxygen compounds
  - perchlorates
- Chlorella**
  - DEF A genus of unicellular green algae to be adapted to converting carbon dioxide into oxygen in a closed ecological system.
  - GS plants (botany)
  - . algae
  - . . **Chlorella**
  - RT aerospace medicine
  - carbon dioxide
  - culture techniques
  - life support systems
  - oxygen
  - photosynthesis
- chlorides**
  - UF *pentachlorides*
  - trichlorides*
  - GS halogen compounds
  - . chlorine compounds
  - . . **chlorides**
  - . . . aluminum chlorides
  - . . . ammonium chlorides
  - . . . beryllium chlorides
  - . . . boron chlorides
  - . . . cadmium chlorides
  - . . . calcium chlorides
  - . . . carbon tetrachloride
  - . . . copper chlorides
  - . . . dichlorides
  - . . . germanium chlorides
  - . . . hydrochlorides
  - . . . hydrogen chlorides
  - . . . hydrochloric acid
  - . . . iron chlorides
  - . . . lanthanum chlorides
  - . . . lead chlorides
  - . . . lithium chlorides
  - . . . magnesium chlorides
  - . . . nitrosyl chlorides
  - . . . nitroxychlorides
  - . . . nitryl chlorides
  - . . . phosgene
  - . . . potassium chlorides
  - . . . silicon tetrachloride
  - . . . silver chlorides
  - . . . sodium chlorides
  - . . . sulfur chlorides
  - . . . tetrachlorides
  - . . . titanium chlorides
  - . . . tungsten chlorides
  - . . . zinc chlorides
  - . halides
  - . . **chlorides**
  - . . . aluminum chlorides
  - . . . ammonium chlorides
  - . . . beryllium chlorides
  - . . . boron chlorides
  - . . . cadmium chlorides
  - . . . calcium chlorides
  - . . . carbon tetrachloride
  - . . . copper chlorides
  - . . . dichlorides
  - . . . germanium chlorides
  - . . . hydrochlorides
  - . . . hydrogen chlorides
  - . . . hydrochloric acid
  - . . . iron chlorides
  - . . . lanthanum chlorides
  - . . . lead chlorides
  - . . . lithium chlorides
  - . . . magnesium chlorides
  - . . . nitrosyl chlorides
  - . . . nitroxychlorides
  - . . . nitryl chlorides
  - . . . phosgene
  - . . . potassium chlorides
  - . . . silicon tetrachloride
  - . . . silver chlorides
  - . . . sodium chlorides
  - . . . sulfur chlorides
  - . . . tetrachlorides
- . . . titanium chlorides
- . . . tungsten chlorides
- . . . zinc chlorides
- RT methyl chloride
- polyvinyl chloride
- salt beds
- chlorination**
  - GS chemical reactions
  - . halogenation
  - . . **chlorination**
  - RT bleaching
  - hydrometallurgy
  - pyrometallurgy
  - water treatment
- chlorine**
  - GS chemical elements
  - . halogens
  - . . **chlorine**
- chlorine compounds**
  - GS halogen compounds
  - . **chlorine compounds**
  - . . chlorates
  - . . chlorides
  - . . . aluminum chlorides
  - . . . ammonium chlorides
  - . . . beryllium chlorides
  - . . . boron chlorides
  - . . . cadmium chlorides
  - . . . calcium chlorides
  - . . . carbon tetrachloride
  - . . . copper chlorides
  - . . . dichlorides
  - . . . germanium chlorides
  - . . . hydrochlorides
  - . . . hydrogen chlorides
  - . . . hydrochloric acid
  - . . . iron chlorides
  - . . . lanthanum chlorides
  - . . . lead chlorides
  - . . . lithium chlorides
  - . . . magnesium chlorides
  - . . . nitrosyl chlorides
  - . . . nitroxychlorides
  - . . . nitryl chlorides
  - . . . phosgene
  - . . . potassium chlorides
  - . . . silicon tetrachloride
  - . . . silver chlorides
  - . . . sodium chlorides
  - . . . sulfur chlorides
  - . . . tetrachlorides
  - . . . titanium chlorides
  - . . . tungsten chlorides
  - . . . zinc chlorides
  - . . . chlorine fluorides
  - . . . chlorine oxides
  - . . . chlorocarbons
  - . . . chlorosilanes
  - . . DDT
  - . . meclizine
  - . . perchlorates
  - . . . aluminum perchlorates
  - . . . ammonium perchlorates
  - . . . hydrazine perchlorates
  - . . . hydrogen perchlorate
  - . . . hydroxylammonium perchlorates
  - . . . lithium perchlorates
  - . . . magnesium perchlorates
  - . . . nitronium perchlorate
  - . . . potassium perchlorates
  - . . trichloroethylene
  - RT  $\infty$  chemical compounds
  - halocarbons
- chlorine fluorides**
  - GS halogen compounds
  - . chlorine compounds
  - . . **chlorine fluorides**
  - . . fluorine compounds
  - . . . fluorides
  - . . . **chlorine fluorides**
  - . . halides
  - . . . fluorides
  - . . . **chlorine fluorides**
- RT liquid rocket propellants
- chlorine oxides**
  - GS chalcogenides
  - . oxides
  - . . **chlorine oxides**
  - halogen compounds
  - . chlorine compounds
  - . . **chlorine oxides**
- chloroaromatics**
  - GS **chloroaromatics**
  - . chlorobenzenes
  - RT  $\infty$  aromatic compounds
- chlorobenzenes**
  - GS chloroaromatics
  - . **chlorobenzenes**
  - organic compounds
  - . cyclic compounds
  - . . cyclic hydrocarbons
  - . . . **chlorobenzenes**
  - . hydrocarbons
  - . . cyclic hydrocarbons
  - . . . **chlorobenzenes**
  - RT benzene
- chlorocarbons**
  - DEF All compounds containing chlorine and carbon with or without other elements.
  - GS carbon compounds
  - . halocarbons
  - . . **chlorocarbons**
  - halogen compounds
  - . chlorine compounds
  - . . **chlorocarbons**
  - . halocarbons
  - . . **chlorocarbons**
  - RT chlorofluorocarbons
- chloroethylene**
  - GS organic compounds
  - . ethylene compounds
  - . . **chloroethylene**
  - . . . trichloroethylene
- chlorofluorocarbons**
  - (added December 1991)
  - DEF A family of compounds of chlorine, fluorine, and carbon, entirely of industrial origin. CFCs include refrigerants, propellants for spray cans and for blowing plastic-foam insulation, styrofoam packaging, and solvents for cleaning electronic circuit boards.
  - UF *CFCs*
  - GS carbon compounds
  - . halocarbons
  - . . **chlorofluorocarbons**
  - halogen compounds
  - . halocarbons
  - . . **chlorofluorocarbons**
  - RT air pollution
  - chlorocarbons
  - chlorofluoromethane
  - contaminants
  - fluorocarbons
  - greenhouse effect
  - ozone depletion
  - ozonosphere
- chlorofluoromethane**
  - GS halogen compounds
  - . fluorine compounds
  - . . fluoro compounds
  - . . . fluorine organic compounds
  - . . . . fluorohydrocarbons
  - . . . . . **chlorofluoromethane**
  - organic compounds
  - . fluorine organic compounds
  - . . fluorohydrocarbons
  - . . . **chlorofluoromethane**
  - . hydrocarbons
  - . . fluorohydrocarbons
  - . . . **chlorofluoromethane**
  - RT air pollution
  - chlorofluorocarbons
  - contaminants
  - methane

## chloroform

ozone depletion

**chloroform**  
GS drugs  
. anesthetics  
. . . **chloroform**  
RT anesthesiology

**chloroformate**  
GS esters  
. **chloroformate**  
formates  
. **chloroformate**

**chlorophylls**  
GS magnesium compounds  
. **chlorophylls**  
organometallic compounds  
. **chlorophylls**  
pigments  
. **chlorophylls**  
porphyrins  
. **chlorophylls**  
RT algae  
brown wave effect  
cells (biology)  
chloroplasts  
Coastal Zone Color Scanner  
dissolved organic matter  
green wave effect  
ocean color scanner  
photosynthesis  
plants (botany)  
porphines  
Sea-viewing Wide Field-of-view  
Sensor  
skin (anatomy)

**chloroplasts**  
GS organelles  
. **chloroplasts**  
RT cells (biology)  
chlorophylls  
cytoplasm  
photosynthesis

**chloroprene resins**  
UF *neoprenes*  
GS elastomers  
. rubber  
. . . synthetic rubbers  
. . . **chloroprene resins**

**chlorosilanes**  
GS halogen compounds  
. chlorine compounds  
. . . **chlorosilanes**  
hydrogen compounds  
. hydrides  
. . . silanes  
. . . **chlorosilanes**  
silicon compounds  
. silanes  
. . . **chlorosilanes**

**chlorpromazine**  
GS hydrazines  
. **chlorpromazine**

*Choctaw helicopter*  
USE **CH-34 helicopter**

*choice*  
USE **selection**

**choked flow**  
(added July 1992)  
GS fluid flow  
. **choked flow**  
RT channel flow  
ducted flow  
flow velocity  
inlet flow  
nozzle flow  
orifice flow  
pipe flow

**chokes**  
SN (EXCLUDES FUEL SYSTEM AND ELECTRONIC DEVICES)  
RT chokes (restrictions)

∞ diffusers  
electric coils  
mixing  
nozzle inserts  
∞ nozzles

**chokes (fuel systems)**  
RT carburetors  
chokes (restrictions)  
fuel systems  
orifices  
∞ systems

**chokes (restrictions)**  
RT chokes  
chokes (fuel systems)  
closures  
constrictions  
impedance  
∞ nozzles  
orifices  
throats  
valves

**cholera**  
GS diseases  
. infectious diseases  
. . . bacterial diseases  
. . . **cholera**  
RT human pathology  
kidney diseases  
pathogenesis  
pathological effects  
physiological effects

**Cholesky factorization**  
DEF A numerical algorithm used to solve linear systems of equations.  
GS factorization  
. **Cholesky factorization**  
RT conjugates  
finite element method  
iterative solution  
real variables

**cholesterol**  
GS organic compounds  
. lipids  
. . . steroids  
. . . **cholesterol**  
RT arteriosclerosis  
liquid crystals

**choline**  
GS organic compounds  
. **choline**  
RT vitamins

*cholinergic blocking agents*  
USE **anticholinergics**

**cholinergics**  
GS drugs  
. **cholinergics**  
. . . anticholinergics  
RT cyclic AMP

**cholinesterase**  
GS biopolymers  
. proteins  
. . . enzymes  
. . . **cholinesterase**  
organic compounds  
. proteins  
. . . enzymes  
. . . **cholinesterase**  
RT neuromuscular transmission

**chondrites**  
DEF Meteoritic stones characterized by small rounded grains or spherules.  
GS celestial bodies  
. meteorites  
. . . stony meteorites  
. . . **chondrites**  
. . . . Bruderheim meteorite  
. . . . carbonaceous chondrites  
. . . . . Alais meteorite  
. . . . . Allende meteorite  
. . . . . Cold Bokkeveld meteorite

. . . . . Ivuna meteorite  
. . . . . Murchison meteorite  
. . . . . Murray meteorite  
. . . . . Orgueil meteorite  
. . . . . Tonk meteorite  
. . . . . Harleton meteorite  
. . . . . Hvittis chondrite  
. . . . . Okhansk meteorite  
. . . . . Pantar chondrites  
. . . . . Pribram meteorite  
RT achondrites  
chondrule  
siderophile elements  
tektites

**chondrule**  
RT chondrites  
enstatite  
meteorites  
meteoritic microstructures  
mineralogy

*choppers (electric)*  
USE **electric choppers**

**chords (geometry)**  
DEF Straight lines intersecting circles or other curves, or straight lines connecting the ends of arcs. In aeronautics, straight lines intersecting or touching airfoil profiles at two points; specifically, those parts of lines between two points of intersections. Used for aerodynamic chords.  
UF *aerodynamic chords*  
GS geometry  
. Euclidean geometry  
. . . lines (geometry)  
. . . **chords (geometry)**  
RT curves (geometry)  
geodesic lines  
tangential blowing  
tangents

**choroid membranes**  
GS anatomy  
. sense organs  
. . . eye (anatomy)  
. . . **choroid membranes**  
membranes  
. **choroid membranes**  
RT vision

*chorus (dawn phenomenon)*  
USE **dawn chorus**

*chorus phenomenon*  
USE **dawn chorus**

**chromates**  
UF *dichromates*  
GS chromium compounds  
. **chromates**  
. . . potassium chromates  
RT ∞ oxygen compounds

**chromatin**  
(added August 2004)  
DEF The material of chromosomes. It is a complex of DNA, histones, and nonhistone proteins ( chromosomal proteins, non-histone) found within the nucleus of a cell.  
RT chromosomes  
cytology  
deoxyribonucleic acid  
neutrophils

**chromatography**  
DEF The separation of chemical substances by making use of differences in the rates at which the substances travel through or along a stationary medium.  
GS chemical tests  
. chemical analysis  
. . . **chromatography**  
. . . gas chromatography  
. . . gel chromatography  
. . . liquid chromatography  
. . . paper chromatography  
. . . thin layer chromatography  
RT adsorption

- colorimetry
- quantitative analysis
- sorption
- chrome*
- USE **chromium**
- chromic acid**
  - GS acids
    - . **chromic acid**
    - chromium compounds
    - . **chromic acid**
- chromites**
  - GS minerals
    - . **chromites**
  - RT chromium
    - chromium oxides
    - peridotite
    - serpentine
- chromium**
  - UF *chrome*
  - GS chemical elements
    - . **chromium**
    - . . chromium isotopes
    - metals
      - . refractory metals
      - . . **chromium**
      - . . . chromium isotopes
      - . transition metals
      - . . **chromium**
      - . . . chromium isotopes
      - refractory materials
      - . refractory metals
      - . . **chromium**
      - . . . chromium isotopes
  - RT chromites
    - heavy metals
    - strategic materials
- chromium alloys**
  - GS alloys
    - . **chromium alloys**
    - . . Astroloy (trademark)
    - . . chromium steels
    - . . Rene 41
    - . . Rene 63
    - . . Rene 77
    - . . Rene 95
  - RT heat resistant alloys
    - Inconel (trademark)
    - stainless steels
    - Stellite (trademark)
    - Waspaloy
- chromium borides**
  - GS boron compounds
    - . borides
    - . . **chromium borides**
    - chromium compounds
    - . **chromium borides**
- chromium bromides**
  - GS chromium compounds
    - . **chromium bromides**
    - halogen compounds
    - . bromine compounds
    - . . bromides
    - . . . **chromium bromides**
    - . halides
    - . . bromides
    - . . . **chromium bromides**
    - . . metal halides
    - . . . **chromium bromides**
- chromium carbides**
  - GS carbon compounds
    - . carbides
    - . . **chromium carbides**
    - chromium compounds
    - . **chromium carbides**
- chromium compounds**
  - GS **chromium compounds**
    - . chromates
    - . . potassium chromates
    - . chromic acid
    - . chromium borides
    - . chromium bromides
- . chromium carbides
- . chromium fluorides
- . chromium oxides
- . sodium chromites
- RT  $\infty$  chemical compounds
- $\infty$  Group 6B compounds
- $\infty$  metal compounds
- chromium fluorides**
  - GS chromium compounds
    - . **chromium fluorides**
    - halogen compounds
    - . fluorine compounds
    - . . fluorides
    - . . . metal fluorides
    - . . . . **chromium fluorides**
    - . halides
    - . . fluorides
    - . . . metal fluorides
    - . . . . **chromium fluorides**
    - . . metal halides
    - . . . metal fluorides
    - . . . . **chromium fluorides**
- chromium isotopes**
  - GS chemical elements
    - . chromium
    - . . **chromium isotopes**
    - . nuclides
    - . . isotopes
    - . . . **chromium isotopes**
    - metals
      - . refractory metals
      - . . chromium
      - . . . **chromium isotopes**
      - . transition metals
      - . . chromium
      - . . . **chromium isotopes**
      - refractory materials
      - . refractory metals
      - . . chromium
      - . . . **chromium isotopes**
- chromium oxides**
  - GS chalcogenides
    - . oxides
    - . . metal oxides
    - . . . **chromium oxides**
    - chromium compounds
    - . **chromium oxides**
  - RT chromites
- chromium steels**
  - DEF Steels containing chromium as the main alloying element.
  - GS alloys
    - . chromium alloys
    - . . **chromium steels**
    - . iron alloys
    - . . steels
    - . . . **chromium steels**
  - RT ferritic stainless steels
- chromophores**
  - (added July 1994)
  - RT color
    - dyes
    - electrochromism
    - nonlinear optics
    - optical activity
    - optical materials
  - $\infty$  optics
  - pigments
- chromosome aberrations**
  - (added August 2004)
  - DEF Abnormal number or structure of chromosomes.
  - RT chromosomes
    - congenital anomalies
    - genes
    - mitosis
    - mutations
    - telomeres
- chromosomes**
  - DEF The self replicating genetic structure of cells containing the cellular DNA that bears in it's nucleotidesequence the linear array of genes.
- RT cells (biology)
- chromatin
- chromosome aberrations
- congenital anomalies
- cytology
- gene expression
- gene therapy
- genes
- genetic code
- genetics
- mitosis
- mutations
- $\infty$  nuclei
- reproductive systems
- telomeres
- tetrad theory
- chromosphere**
  - DEF A thin layer of relatively transparent gases above the photosphere of the sun.
  - GS environments
    - . extraterrestrial environments
    - . . stellar atmospheres
    - . . . **chromosphere**
  - RT coronal loops
    - faculae
    - photosphere
    - solar atmosphere
    - solar corona
    - solar prominences
    - solar transition region
    - spicules
    - stellar structure
    - stellar winds
    - Transition Region and Coronal Explorer
- chronaxy**
  - GS time
    - . reaction time
    - . . **chronaxy**
  - RT responses
    - sensory stimulation
    - thresholds (perception)
- chronic conditions**
  - GS conditions
    - . **chronic conditions**
  - RT blood volume
    - diseases
    - disorders
    - health
- chronobiology*
- USE **rhythm (biology)**
- chronographs*
- USE **chronometers**
- chronology**
  - UF *age determination*
  - dating*
  - GS **chronology**
    - . geochronology
  - RT time
- chronometers**
  - UF *chronographs*
  - GS measuring instruments
    - . time measuring instruments
    - . . clocks
    - . . . **chronometers**
  - RT atomic clocks
    - clock paradox
    - time measurement
    - timing devices
- chronophotography**
  - UF *time lapse photography*
  - GS imagery
    - . photography
    - . . **chronophotography**
  - RT black and white photography

## Chukchi Sea

motion pictures

### chronotrons

USE **pulse rate**  
**time lag**

### chugging

USE **combustion stability**

### Chukchi Sea

DEF Part of the Arctic Ocean north of the Bering Strait between Asia and North America.

GS seas  
. **Chukchi Sea**  
RT Arctic regions

### chutes

UF *slides*  
RT conveyors  
materials handling

### CID

USE **charge injection devices**

### cinder cones

USE **cones (volcanoes)**

### cinefluorography

USE **motion pictures**  
**radiography**

### cinematography

GS imagery  
. photography  
. . **cinematography**  
RT animation  
black and white photography  
cameras  
color photography  
infrared photography  
motion pictures  
stereophotography  
streak cameras  
video tapes

### cineradiography

USE **motion pictures**  
**radiography**

### cinespectrographs

RT optical measuring instruments  
spectroscopy

### cinetheodolites

GS measuring instruments  
. optical measuring instruments  
. . transits  
. . . theodolites  
. . . . **cinetheodolites**  
optical equipment  
. optical measuring instruments  
. . transits  
. . . theodolites  
. . . . **cinetheodolites**  
RT photographic tracking  
satellite tracking

### circadian rhythms

DEF Regular changes in physiological function occurring in approximately 24 hour cycles. Used for diurnal rhythms.

UF *diurnal rhythms*  
GS rhythm (biology)  
. **circadian rhythms**  
RT activity cycles (biology)  
photoperiod  
zeitgebers

### circles (geometry)

GS geometry  
. Euclidean geometry  
. . **circles (geometry)**  
. . . great circles  
RT circumferences  
curves (geometry)  
ellipses  
radii  
 $\infty$  rings  
 $\infty$  sectors  
segments

spheres

### circuit boards

RT electronic packaging  
printed circuits

### circuit breakers

UF *breakers (electric)*  
RT disconnect devices  
dropouts  
electric relays  
 $\infty$  fuses  
switches  
switching circuits

### circuit diagrams

UF *schematics*  
GS diagrams  
. **circuit diagrams**  
RT engineering drawings  
layouts  
photomasks

### circuit protection

GS protection  
. **circuit protection**  
RT capacitors  
circuits  
current regulators  
electric fuses  
electric power transmission  
electric reactors  
electrical faults  
electrical grounding  
electrical insulation  
expulsion  
 $\infty$  fuses  
overvoltage  
phase control  
phase error  
sneak circuit analysis  
suppressors  
surges  
transformers  
transmission circuits  
transmission lines  
voltage regulators

### circuit reliability

GS reliability  
. **circuit reliability**  
RT aircraft reliability  
component reliability  
drift (instrumentation)  
quality control  
sneak circuit analysis  
spacecraft reliability

### circuits

DEF Networks providing one or more closed paths. Used for electric circuits, exploding conductor circuits, shunts, and subcircuits.

UF *electric circuits*  
*exploding conductor circuits*  
*shunts*  
*subcircuits*  
GS **circuits**

. adding circuits  
. analog circuits  
. autodynes  
. bistable circuits  
. . flip-flops  
. cancellation circuits  
. clamping circuits  
. coincidence circuits  
. comparator circuits  
. conjugated circuits  
. counting circuits  
. . scalars  
. coupling circuits  
. delay circuits  
. . phantastrons  
. digital integrators  
RT diplexers  
. discriminators  
. . Fraunhofer line discriminators  
. . frequency discriminators  
. echo suppressors  
. electric bridges  
. . wire bridge circuits

. . . Wheatstone bridges  
. equivalent circuits  
. feedback circuits  
. fire control circuits  
. fluidic circuits  
. gates (circuits)  
. . field-programmable gate arrays  
. . threshold gates  
. hybrid circuits  
. integrated circuits  
. . application specific integrated circuits  
. . DTL integrated circuits  
. . encapsulated microcircuits  
. . field-programmable gate arrays  
. . large scale integration  
. . linear integrated circuits  
. . medium scale integration  
. . TTL integrated circuits  
. . very large scale integration  
. . VHSIC (circuits)  
. iterative networks  
. LC circuits  
. limiter circuits  
. . clipper circuits  
. linear circuits  
. magnetic circuits  
. matrices (circuits)  
. microwave circuits  
. mixing circuits  
. multivibrators  
. . flip-flops  
. . monostable multivibrators  
. negative resistance circuits  
. Ohms law  
. phase detectors  
. . synchroscopes  
. phase shift circuits  
. . circulators (phase shift circuits)  
. pneumatic circuits  
. power supply circuits  
. printed circuits  
. RC circuits  
. RL circuits  
. . RLC circuits  
. squelch circuits  
. sweep circuits  
. switching circuits  
. . fluid switching elements  
. logic circuits  
. transistor circuits  
. transmission circuits  
. trigger circuits  
. varactor diode circuits  
. . threshold gates  
RT amplifiers  
breadboard models  
capacitors  
 $\infty$  cascades  
circuit protection  
differentiators  
digital electronics  
duality principle  
duplexers  
electric connectors  
electric current  
 $\infty$  electric equipment  
electric filters  
electric motors  
electric power transmission  
electric wire  
electrical grounding  
electromechanics  
electron tubes  
flat conductors  
inductors  
integrators  
Kirchhoff law of networks  
loops  
microelectronics  
microminiaturization  
microstrip devices  
miniature electronic equipment  
miniaturization  
modules  
network analysis  
oscillators  
selectors  
short circuits

- signal generators
  - solid state devices
  - solions
  - ∞ strip
  - transmission lines
  - trees (mathematics)
  - underground transmission lines
  - voltage controlled oscillators
  - wiring
- circular cones**
- GS cones
    - . **circular cones**
  - RT half cones
  - nose cones
- circular cylinders**
- RT ∞ cylinders
  - cylindrical bodies
  - cylindrical shells
  - elliptical cylinders
- circular orbits**
- GS orbits
    - . **circular orbits**
    - . . stationary orbits
  - RT Earth orbits
    - eccentric orbits
    - elliptical orbits
    - equatorial orbits
    - geosynchronous orbits
    - lunar orbits
    - orbital mechanics
    - planetary orbits
    - polar orbits
    - quadratures
    - satellite orbits
    - solar orbits
    - spacecraft orbits
    - twenty-four hour orbits
- circular plates**
- GS structural members
    - . plates (structural members)
    - . . **circular plates**
  - RT annular plates
  - disks (shapes)
  - end plates
  - flat plates
- circular polarization**
- GS polarization (waves)
    - . **circular polarization**
  - RT elliptical polarization
  - optical polarization
- circular shells**
- GS shells (structural forms)
    - . **circular shells**
  - RT cylindrical shells
  - hemispherical shells
  - metal shells
  - spherical shells
- circular tubes**
- RT cylindrical shells
  - duct geometry
  - pipes (tubes)
  - ∞ tubes
- circular waveguides**
- DEF Small hollow tubes that are designed to transmit a specific wavelength along the length of the tube.
  - GS waveguides
    - . **circular waveguides**
  - RT microwave transmission
  - propagation modes
- circulation**
- DEF The flow or motion of a fluid in or through a given area or volume. A precise measure of the average flow of a fluid along a given closed curve. Used for recirculation.
  - UF *recirculation*
  - GS **circulation**
    - . atmospheric circulation
    - . . zonal flow (meteorology)
    - . blood circulation
    - . . brain circulation
    - . . . coronary circulation
    - . . . intercranial circulation
    - . . . ocular circulation
    - . . . peripheral circulation
    - . . . pulmonary circulation
    - . water circulation
    - . . water currents
    - . . . ocean currents
    - . . . . coastal currents
    - . . . . el Nino
    - . . . . Gulf Stream
    - . . . . Lomonosov current
    - . . . . thermohaline circulation
  - RT blowing
  - circulation distribution
  - congestion
  - ∞ currents
  - delivery
  - diffusion
  - dispersing
  - ∞ flow
  - fluid flow
  - purging
  - rotation
- circulation control airfoils**
- DEF Airfoils in which a high lift capability is produced by supercirculation where control of the stagnation points by the jet sheet produces high lift coefficients.
  - GS airfoils
    - . **circulation control airfoils**
    - . . circulation control rotors
  - RT blowing
  - boundary layer control
  - Coanda effect
  - ∞ control
  - lift augmentation
  - short takeoff aircraft
  - tangential blowing
  - under surface blowing
  - upper surface blowing
- circulation control rotors**
- DEF Rotors that provide STOL capability on high performance aircraft by means of tangential blowing over a rounded trailing edge and mass flow characteristic of turbine engine bleed.
  - GS airfoils
    - . circulation control airfoils
    - . . **circulation control rotors**
    - . wings
    - . . rotary wings
    - . . . **circulation control rotors**
    - rotating bodies
    - . rotors
    - . . rotary wings
    - . . . **circulation control rotors**
  - RT ∞ control
  - vertical takeoff aircraft
  - x wing rotors
- circulation distribution**
- DEF The line integral of the velocity component around a curve along the closed contour.
  - RT atmospheric circulation
  - circulation
  - ∞ distribution
  - velocity distribution
- circulators (phase shift circuits)**
- GS circuits
    - . phase shift circuits
    - . . **circulators (phase shift circuits)**
  - RT cavity resonators
  - delay circuits
  - duplexers
  - Faraday effect
  - Hall generators
  - limiter circuits
- circulatory system**
- GS anatomy
    - . **circulatory system**
    - . . cardiovascular system
    - . . . blood vessels
    - . . . . arteries
    - . . . . . aorta
    - . . . . . arterioles
    - . . . . . capillaries (anatomy)
- . . . . . glomerulus
  - . . . . . veins
  - . . . . . heart
  - . . . . . cardiac auricles
  - . . . . . cardiac ventricles
  - . . . . . epicardium
  - . . . . . heart conduction system
  - . . . . . myocardium
- RT arteriosclerosis
- artificial cardiac pacemaker
- blood circulation
- blood pumps
- carotid sinus body
- carotid sinus reflex
- exercise physiology
- hypervolemia
- organs
- circumferences**
- GS geometry
    - . Euclidean geometry
    - . . analytic geometry
    - . . . **circumferences**
  - RT boundaries
  - circles (geometry)
  - diameters
  - radii
- circumlunar communication**
- GS telecommunication
    - . space communication
    - . . lunar communication
    - . . . **circumlunar communication**
  - RT interplanetary communication
  - radar
  - radio communication
  - satellite communication
  - spacecraft communication
  - unified S band
- circumlunar trajectories**
- GS trajectories
    - . round trip trajectories
    - . . **circumlunar trajectories**
    - . . spacecraft trajectories
    - . . lunar trajectories
    - . . . **circumlunar trajectories**
  - RT Earth orbits
  - Earth-Moon trajectories
  - lunar flight
  - lunar orbits
  - moon-Earth trajectories
  - reentry trajectories
  - rendezvous trajectories
  - transfer orbits
- circumpolar westerlies**
- GS wind (meteorology)
    - . **circumpolar westerlies**
  - RT atmospheric circulation
  - jet streams (meteorology)
  - winds aloft
  - zonal flow (meteorology)
- circumsolar radiation**
- DEF Radiation from small angle scattering of direct sunlight from atmospheric aerosols with dimensions on the order of or greater than the wavelength of light.
  - GS extraterrestrial radiation
    - . solar radiation
    - . . **circumsolar radiation**
  - RT atmospheric scattering
  - light scattering
  - ∞ radiation
  - scattering
  - sunlight
- circumsolar telescopes**
- DEF Optical instruments for measuring the circumsolar radiation for application to solar energy systems. Mirrors and lenses are utilized for incident sunlight concentration.
  - GS telescopes
    - . **circumsolar telescopes**
  - RT lenses
  - measuring instruments
  - mirrors
  - optical equipment
  - radiation pyrometers



## cirques (landforms)

solar radiation

*circumstellar matter*  
USE **stellar envelopes**

### cirques (landforms)

GS landforms  
. structural basins  
. . **cirques (landforms)**  
RT glaciers  
ice  
mountains  
snow

### cirrocumulus clouds

DEF Cirriform clouds appearing as a thin sheet of small white puffs resembling flakes or patches of cotton without shadows.

GS clouds (meteorology)  
. **cirrocumulus clouds**  
RT atmospheric moisture  
cirrostratus clouds  
climatology  
cloud cover  
fog  
meteorology  
nephelometry  
precipitation (meteorology)  
thunderstorms  
weather

### cirrostratus clouds

DEF Cirriform clouds appearing as a whitish veil. Usually fibrous, sometimes smooth, they often produce halo phenomena. This form may totally cover the sky.

GS clouds (meteorology)  
. **cirrostratus clouds**  
RT atmospheric moisture  
cirrocumulus clouds  
climatology  
cloud cover  
fog  
meteorology  
nephelometry  
precipitation (meteorology)  
thunderstorms  
weather

### cirrus clouds

DEF Cirriform clouds in the form of thin, white featherlike shapes in patches or narrow bands. They have a fibrous and/or silky sheen. Large ice crystals often trail downward a considerable vertical distance in fibrous, slanted, or irregularly curved wisps called mares' tails.

GS clouds (meteorology)  
. **cirrus clouds**

### cirrus shields

GS clouds (meteorology)  
. **cirrus shields**  
RT climatology  
meteorology  
weather forecasting

### CIS

USE **Commonwealth of Independent States**

### cislunar space

DEF Of or pertaining to phenomena, projects, or activity in the space between the Earth and the moon, or between the Earth and the moon's orbit.

GS environments  
. aerospace environments  
. . **cislunar space**  
. extraterrestrial environments  
. . **cislunar space**  
RT deep space  
Earth-Moon trajectories  
interplanetary space  
lunar flight  
lunar orbits  
∞ space

### cities

UF *metropolitan areas*

*urban areas*  
GS **cities**  
. Atlanta (GA)  
. Cedar Rapids (IA)  
. Houston (TX)  
. Manitou (CO)  
. Moscow  
. New Haven (CT)  
. New York City (NY)  
. Phoenix (AZ)  
. Pontiac (MI)  
. San Francisco (CA)  
. Vatican City

RT anthropology  
communities  
heat islands  
industrial areas  
inhabitants  
megalopolises  
nations  
residential areas  
sociology  
suburban areas  
urban development  
urban planning  
urban research

### citrates

RT citric acid  
esters

### citric acid

GS acids  
. carboxylic acids  
. . **citric acid**  
organic compounds  
. carbohydrates  
. . **citric acid**  
. carboxylic acids  
. . **citric acid**  
RT citrates

### citrus trees

GS plants (botany)  
. trees (plants)  
. . **citrus trees**  
RT agriculture  
blight  
botany  
crop growth  
crop vigor  
∞ crops  
curing  
∞ food  
irrigation  
orchards  
seeds

### civil aviation

UF *commercial aviation*  
RT A-380 aircraft  
∞ aeronautics  
air law  
airline operations  
aviation meteorology  
commercial aircraft  
general aviation aircraft  
passenger aircraft

### civil defense

RT air defense  
antimissile defense  
chemical defense  
∞ defense  
defense program  
evacuating (transportation)  
nuclear explosions  
nuclear warfare  
protection  
Sentinel system  
shelters  
survival  
warning  
warning systems

### CL-41 aircraft

UF *Canadair CL-41 aircraft*  
*CT-114 aircraft*  
*Tutor aircraft*  
GS attack aircraft

. **CL-41 aircraft**  
*Canadair aircraft*  
. **CL-41 aircraft**  
*General Dynamics aircraft*  
. **CL-41 aircraft**  
jet aircraft  
. **CL-41 aircraft**  
monoplanes  
. **CL-41 aircraft**  
RT ∞ aircraft

### CL-44 aircraft

UF *Canadair CL-44 aircraft*  
*CC-106 aircraft*  
*Yukon aircraft*  
GS *Canadair aircraft*  
. **CL-44 aircraft**  
*General Dynamics aircraft*  
. **CL-44 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **CL-44 aircraft**  
monoplanes  
. **CL-44 aircraft**  
transport aircraft  
. cargo aircraft  
. . **CL-44 aircraft**  
RT ∞ aircraft

### CL-84 aircraft

UF *Canadair CL-84 aircraft*  
GS *antisubmarine warfare aircraft*  
. **CL-84 aircraft**  
*Canadair aircraft*  
. **CL-84 aircraft**  
*General Dynamics aircraft*  
. **CL-84 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **CL-84 aircraft**  
tilt wing aircraft  
. **CL-84 aircraft**  
transport aircraft  
. **CL-84 aircraft**  
V/STOL aircraft  
. **CL-84 aircraft**  
RT ∞ aircraft

### CL-595 helicopter

USE **XH-51 helicopter**

### CL-600 challenger aircraft

DEF *Canadair turboprop aircraft with supercritical wings.*  
GS *Canadair aircraft*  
. **CL-600 challenger aircraft**  
*general aviation aircraft*  
. **CL-600 challenger aircraft**  
jet aircraft  
. turboprop aircraft  
. . **CL-600 challenger aircraft**  
RT ∞ aircraft  
∞ military aircraft  
supercritical wings

### CL-823 aircraft

UF *Lockheed CL-823 aircraft*  
GS jet aircraft  
. **CL-823 aircraft**  
*Lockheed aircraft*  
. **CL-823 aircraft**  
supersonic aircraft  
. supersonic transports  
. . **CL-823 aircraft**  
transport aircraft  
. **CL-823 aircraft**  
RT ∞ aircraft

### cladding

DEF A coating placed on the surface of a material and usually bonded to the material.  
GS metal working  
. **cladding**  
RT anodic stripping  
cathodic coatings  
cold working  
composite materials  
explosive welding  
extruding  
laminates

metal coatings  
metallizing  
plating  
protective coatings

**claiming**

RT ∞ law  
patents  
preempting

**clamped structures**

(added February 1998)  
RT beams (supports)  
clamps  
composite structures  
joints (junctions)  
laminates  
plates (structural members)  
shells (structural forms)  
structural members  
structural vibration  
∞ structures

**clamping circuits**

DEF Circuits which maintain either extremity of a waveform at a prescribed potential. Networks for adjusting the absolute voltage level of waveforms.  
GS circuits  
    . **clamping circuits**  
RT limiter circuits  
power limiters

**clamps**

RT ∞ bands  
clamped structures  
clips  
fasteners  
holders  
jigs  
mechanical devices  
sealing  
straps

**clarity**

RT atmospheric optics  
electromagnetic properties  
haze  
opacity  
optical properties  
purity  
∞ sharpness  
solubility  
transparency  
turbidity

Clark Y airfoil

USE **airfoil profiles**

**CLARREO (observatory)**

(added December 2009)  
DEF Multi-satellite observatory that will detect climate change through high-accuracy measurements of emitted infrared radiation, reflected solar radiances, and GPS occultation refractivities. CLARREO data will also be used to calibrate a wide range of sensors flying aboard other U.S. Earth observing spacecraft.  
UF *Climate Absolute Radiance and Refractivity Observatory*  
GS observatories  
    . **CLARREO (observatory)**  
RT atmospheric radiation  
climate change  
climatology  
Earth observations (from space)  
Earth Observing System (EOS)  
global warming

**classes**

RT categories  
∞ groups  
∞ sections

Classic aircraft

USE **IL-62 aircraft**

**classical mechanics**

GS mechanics (physics)  
    . **classical mechanics**

. . space mechanics  
. . . astrodynamics  
. . . celestial mechanics  
. . . orbital mechanics  
. . . . Kepler laws  
. . . . minimum variance orbit  
determination

RT angular momentum  
continuum mechanics  
equations of motion  
Euler-Lagrange equation  
Hamiltonian functions  
Lagrange coordinates  
Maxwell bodies  
momentum  
phase-space integral  
Poisson equation  
quaternions  
statistical mechanics

**classifications**

GS **classifications**  
    . hierarchies  
    . . BBGKY hierarchy  
    . . dichotomies  
    . indexes (documentation)  
    . . KWIC indexes  
    . . Wiswesser notations  
    . subjects  
RT astronomical catalogs  
∞ breakdown  
∞ classifying  
cluster analysis  
congeners  
image classification  
taxonomy

**classifiers**

GS separators  
    . **classifiers**  
    . . sizing screens  
    . . thickeners (equipment)  
RT centrifuges  
concentrating  
concentrators  
flotation  
∞ separation  
shakers  
size determination  
size separation  
spirals (concentrators)

∞ **classifying**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *sorting*  
RT classifications  
concentrators  
discriminant analysis (statistics)  
evaluation  
image classification  
security  
selection  
size separation  
sorting algorithms  
taxonomy

**clathrates**

RT ∞ chemical compounds  
crystal structure  
crystals  
inclusions

**clays**

GS **clays**  
    . illite  
    . kaolinite  
    . montmorillonite  
    . vermiculite  
RT alluvium  
boreholes  
bricks  
ceramics  
colloids  
fans (landforms)  
grout  
masonry  
mining  
molding materials

mud  
refractory materials  
rocks  
sedimentary rocks  
sediments  
shales  
sizing materials  
soils  
strip mining

**clean energy**

RT air pollution  
environment pollution  
environmental engineering  
geothermal energy conversion  
renewable energy  
tidepower  
water pollution  
waterwave energy  
windpower utilization

**clean fuels**

DEF Energy sources from which pollutants and other impurities have been removed by refining, purification, and other means, to produce fuels less conducive to pollution.  
GS fuels  
    . **clean fuels**  
RT beneficiation  
chemical fuels  
hydrocarbon fuels  
pollution  
refining  
synthetic fuels

**clean rooms**

DEF Areas in which the temperature, humidity, and the airborne particulate contamination are controlled as required.  
GS rooms  
    . **clean rooms**  
RT assembling  
cleanliness  
controlled atmospheres  
environmental control

**cleaners**

GS **cleaners**  
    . air filters  
RT ∞ absorbers  
absorbers (equipment)  
absorbers (materials)  
cleaning  
cleanliness  
separators  
ultrasonic cleaning  
washers (cleaners)

**cleaning**

GS **cleaning**  
    . chemical cleaning  
    . . pickling (metallurgy)  
    . housekeeping (spacecraft)  
    . sterilization  
    . . chemical sterilization  
    . . spacecraft sterilization  
    . ultrasonic cleaning  
    . washing  
    . . bathing  
    . environmental cleanup  
RT abrasion  
antifouling  
antiseptics  
bleaching  
cleaners  
cleanliness  
clearing  
corrosion prevention  
decontamination  
descaling  
dissolving  
dust  
flushing  
metal finishing  
metal polishing  
paint removal  
polishing  
purification  
∞ reduction  
refining

## cleanliness

- scarfing
- scavenging
- scrubbers
- ∞ separation
- surface finishing
- trichloroethylene
- waste water

### cleanliness

- GS **cleanliness**
- . housekeeping (spacecraft)
- RT clean rooms
- cleaners
- cleaning
- hygiene
- oral hygiene

### clear air turbulence

- GS turbulence
- . atmospheric turbulence
- . . **clear air turbulence**
- RT aviation meteorology
- gusts
- jet streams (meteorology)
- thermal instability
- turbulent diffusion
- wind shear

### clearances

- RT adjusting
- alignment
- allowances
- datum (elevation)
- spacing
- tightness
- tolerances (mechanics)

### clearing

- RT cleaning
- purging
- removal

### clearings (openings)

- UF *slashes*
- GS **clearings (openings)**
- . firebreaks
- . polynyas
- RT deforestation
- forests
- trees (plants)

### cleavage

- UF *scission*
- RT brittle materials
- brittleness

### Clebsch-Gordan coefficients

- GS coefficients
- . **Clebsch-Gordan coefficients**
- RT angular momentum
- coupling

### Clementine spacecraft

(*added May 1997*)  
DEF A spacecraft launched in January 1994 as part of a joint NASA/DoD-BMDO (Ballistic Missile Defense Organization) mission to space-qualify several lightweight electronic instruments and systems (including an ultraviolet/visible CCD camera, a near infrared and long-wavelength infrared camera, and a combined high-resolution CCD camera and laser ranging system). The Clementine mission also provided the first complete systematic surface mapping of the moon from the ultraviolet to near infrared spectral regions. A software malfunction in May of 1994 precluded a planned flyby of the asteroid Geographos.

- RT asteroid missions
- CCD cameras
- flyby missions
- lunar exploration
- lunar maps
- lunar spacecraft
- lunar surface
- ∞ spacecraft

### client server systems

- (*added May 1996*)
- GS networks

- . computer networks
- . . **client server systems**
- RT architecture (computers)
- computer systems design
- distributed processing
- internets
- Java (programming language)
- on-line systems

### cliffs

- UF *bluffs (landforms)*
- RT canyons
- escarpments
- fiords
- landslides
- ledges
- ∞ shelves
- slopes
- topography

### climate

- UF *macroclimate*
- RT climate change
- climatology
- long term effects
- meteorology
- paleoclimatology
- Southern Oscillation
- weather

*Climate Absolute Radiance and Refractivity Observatory*

(*added December 2009*)

USE **CLARREO (observatory)**

### climate change

- RT air pollution
- atmospheric composition
- atmospheric temperature
- biomass burning
- carbon dioxide concentration
- CERES (experiment)
- CLARREO (observatory)
- climate
- climate models
- climatology
- global warming
- Glory Mission satellite
- GRACE mission
- greenhouse effect
- man environment interactions
- Mission to Planet Earth
- Orbiting Carbon Observatory (OCO)
- paleoclimatology
- radiative forcing
- stratospheric warming

### climate models

(*added March 1995*)

- GS models
- . **climate models**
- RT atmospheric models
- climate change
- environment models
- hydrology models
- ocean models

### climatology

DEF Branch of meteorology that studies the average weather conditions and statistical variations for a specified region over an extended period of time.

- UF *Milankovitch theory*

- GS **climatology**
- . agroclimatology
- . hydroclimatology
- . microclimatology
- . paleoclimatology
- RT Antarctic regions
- anvil clouds
- Arctic regions
- atmospheric circulation
- Atmospheric General Circulation
- Models
- cap clouds
- cirrocumulus clouds
- cirrostratus clouds
- cirrus shields
- CLARREO (observatory)
- climate

- climate change
- cloud cover
- cloud dispersal
- clouds (meteorology)
- dendrochronology
- desertline
- deserts
- environmental chemistry
- environmental engineering
- FIRE (climatology)
- fog dispersal
- geography
- Glory Mission satellite
- hailstorms
- heat islands
- humidity
- hurricanes
- hydrology
- intraseasonal variations
- ISCCP Project
- lightning suppression
- Madden-Julian Oscillation
- meteorology
- middle atmosphere
- NPOESS
- periodic variations
- phenology
- polar meteorology
- polar regions
- precipitation (meteorology)
- primitive equations
- quasi-biennial oscillation
- radiative forcing
- rainmaking
- sea breeze
- seasons
- snowstorms
- solar radiation
- storm enhancement
- storm suppression
- storms
- storms (meteorology)
- sunlight
- teleconnections (meteorology)
- temperate regions
- temperature
- tropical regions
- weather
- wind (meteorology)
- zonal flow (meteorology)

### climbing flight

- GS ascent
- . **climbing flight**
- RT ascent trajectories
- coasting flight
- ∞ flight
- flight paths
- horizontal flight
- parabolic flight
- rocket flight
- soaring
- takeoff
- turning flight
- vertical flight

### clinical markers

(*added August 2004*)

USE **biomarkers**

### clinical medicine

- GS medical science
- . **clinical medicine**
- RT anesthesiology
- bed rest
- blood volume
- case histories
- diagnosis
- examination
- healing
- health
- human beings
- ∞ medicine
- ∞ operations
- sports medicine
- surgery
- transplantation

- ∞ treatment
- clinorotation**  
(added July 2000)  
DEF Rotational motion of a test subject about one or more axes that are inclined with respect to the gravitational vector; often applied to simulate a microgravity environment.  
UF *clinostat rotation*  
*clinostating*  
GS gyration  
. rotation  
. . . **clinorotation**  
RT centrifuging  
clinostats  
gravitational effects  
gravitational physiology  
microgravity  
rotating environments  
space environment simulation  
weightlessness  
weightlessness simulation
- clinostat rotation*  
(added July 2000)  
USE **clinorotation**
- clinostating*  
(added August 2000)  
USE **clinorotation**
- clinostats**  
(added July 2000)  
DEF Devices for producing vector-averaged gravitational environments which mimic microgravity.  
UF *random positioning machines*  
GS simulators  
. environment simulators  
. . space simulators  
. . . **clinostats**  
RT bioreactors  
centrifuges  
clinorotation  
gravitational effects  
gravitational physiology  
microgravity  
rotating environments  
space environment simulation  
tissue engineering  
weightlessness simulation
- clipper circuits**  
GS circuits  
. limiter circuits  
. . **clipper circuits**  
RT comparator circuits  
power limiters
- clips**  
RT anchors (fasteners)  
∞ bands  
clamps  
couplings  
fasteners  
holders  
mechanical devices
- clock paradox**  
GS time measurement  
. **clock paradox**  
RT atomic clocks  
chronometers  
time signals  
timing devices
- clocks**  
UF *watches*  
GS measuring instruments  
. time measuring instruments  
. . **clocks**  
. . . atomic clocks  
. . . autonomous spacecraft clocks  
. . . chronometers  
RT time measurement  
time synchronization
- timing devices
- clogging*  
USE **plugging**
- clone cells**  
(added August 2004)  
DEF A group of genetically identical cells all descended from a single common ancestral cell by mitosis in eukaryotes or by binary fission in prokaryotes. Clone cells also include populations of recombinant DNA molecules all carrying the same inserted sequence.  
GS cells (biology)  
. cultured cells  
. . **clone cells**  
RT biotechnology  
cell culturing  
cloning (biology)  
culture media  
culture techniques  
cytology  
genetic engineering  
organ culturing  
tissue culturing
- cloning (biology)**  
(added August 1997)  
RT biotechnology  
cells (biology)  
clone cells  
culture media  
culture techniques  
cultured cells  
deoxyribonucleic acid  
gene expression  
genes  
genetic code  
genetic engineering  
genetics  
phenotype  
plasmids  
reproduction (biology)
- close packed lattices**  
GS crystal lattices  
. **close packed lattices**  
RT body centered cubic lattices  
face centered cubic lattices
- closed basins*  
USE **structural basins**
- closed circuit television**  
GS communication equipment  
. **closed circuit television**  
telecommunication  
. **closed circuit television**  
television systems  
. **closed circuit television**  
RT cable television  
color television  
educational television  
stereotelevision  
television cameras  
television receivers  
television transmission  
wireless communication
- closed cycles**  
SN (EXCLUDES CLOSED LOOP CONTROL SYSTEMS)  
RT control theory  
cooling systems  
electric generators  
gas turbines  
loops  
nuclear reactors  
plasma generators  
thermal cycling tests  
thermodynamic cycles
- closed ecological systems**  
DEF Systems that provide for the maintenance of life in an isolated living chamber through complete reutilization of the material available, in particular, by means of a cycle wherein exhaled carbon dioxide, urine, and other waste matter are converted chemically or by photosynthesis into oxygen, water, and food. Used for bioregenerative life support systems.
- UF *bioregenerative life support systems*  
GS support systems  
. life support systems  
. . **closed ecological systems**  
RT aerospace medicine  
bioastronautics  
ecology  
ecosystems  
food production (in space)  
gnatobiotics  
long term effects  
oxygen production  
space habitats  
spacecraft cabin atmospheres  
spacecraft environments  
survival  
∞ systems
- closed faults*  
USE **geological faults**
- closed loop systems*  
USE **feedback control**
- closing**  
RT blocking  
plugging  
sealing  
stopping
- Clostridium**  
GS microorganisms  
. bacteria  
. . **Clostridium**  
. . . Clostridium botulinum  
RT bacterial diseases
- Clostridium botulinum**  
GS microorganisms  
. bacteria  
. . Clostridium  
. . . **Clostridium botulinum**  
RT bacteriology  
pathogens  
toxic diseases
- closure law**  
GS laws  
. **closure law**  
RT field theory (physics)  
k-epsilon turbulence model  
statistical mechanics  
turbulent flow
- closures**  
RT ∞ barriers  
blocking  
chokes (restrictions)  
constrictions  
couplings  
coverings  
enclosures  
end plates  
fasteners  
fittings  
∞ gates  
joints (junctions)  
plugging  
plugs  
seals (stoppers)  
tightness  
valves
- cloth*  
USE **fabrics**
- clothing**  
GS **clothing**  
. boots (footwear)  
. cotton fibers  
. coveralls  
. flight clothing  
. garments  
. gloves  
. goggles  
. protective clothing  
. . helmets  
. . pressure suits  
. . . space suits  
. . . extravehicular mobility units

## clotting

- . . vapor barrier clothing
- . shoes
- . socks
- . suits
- . . . pressure suits
- . . . space suits
- . . . . extravehicular mobility units
- RT chemical defense
- consumables (spacecrew supplies)
- cotton
- cuffs
- fabrics
- leather
- textiles
- vests

## clotting

- RT blood coagulation
- embolisms
- thrombocytes
- thromboplastin

## cloud chambers

DEF Devices for observing the paths of ionizing particles, based on the principle that supersaturated vapor condenses more readily on ions than on neutral molecules.

- GS ionization chambers
- . **cloud chambers**
- RT bubble chambers
- ∞ chambers
- radiation counters
- spark chambers

## cloud cover

- UF *overcast*
- RT anvil clouds
- ∞ blankets
- cap clouds
- cirrocumulus clouds
- cirrostratus clouds
- climatology
- clouds (meteorology)
- FIRE (climatology)
- flight conditions
- ISCCP Project
- meteorological parameters
- meteorology
- METEOSAT satellite
- nephanalysis
- shadows
- sky
- sky brightness
- solar radiation
- sunlight
- Venus clouds
- Venus surface
- weather forecasting

## cloud dispersal

- GS weather modification
- . **cloud dispersal**
- RT climatology
- clouds (meteorology)
- dispersing

## cloud glaciation

- GS ice formation
- . **cloud glaciation**
- RT freezing
- graupel
- hail
- ice clouds
- ice nuclei
- snow
- snow cover

## cloud height indicators

- UF *ceilometers*
- GS measuring instruments
- . indicating instruments
- . . **cloud height indicators**
- . meteorological instruments
- . . **cloud height indicators**
- RT ceilings (meteorology)

## cloud photographs

- GS photographs
- . **cloud photographs**
- RT aerial photography

- all sky photography
- photography
- spaceborne photography
- TIROS project

## cloud photography

- GS imagery
- . photography
- . . **cloud photography**
- RT aerial photography
- all sky photography
- black and white photography
- ESSA satellites
- meteorological satellites
- METEOSAT satellite
- Nimbus 1 satellite
- Nimbus 2 satellite
- Nimbus project
- Nimbus satellites
- spaceborne photography
- TIROS operational satellite system
- TIROS project
- TIROS satellites

## cloud physics

DEF A subdivision of physical meteorology concerned with physical properties of clouds in the atmosphere and the processes occurring therein.

- GS atmospheric physics
- . **cloud physics**
- RT Aitken nuclei
- Atmospheric Cloud Physics Lab (Spacelab)
- atmospheric electricity
- CERES (experiment)
- condensation nuclei
- condensing
- convection clouds
- drop size
- fog dispersal
- graupel
- nephanalysis
- Ophiuchi clouds
- ∞ physics
- precipitation (meteorology)
- ∞ science
- Venus clouds
- weather modification

## cloud seeding

DEF Any technique carried out with the intent of adding to a natural cloud in a planetary atmosphere certain substances that will alter the natural development of that cloud.

- GS nucleation
- . **cloud seeding**
- weather modification
- . **cloud seeding**
- RT clouds (meteorology)
- precipitation (meteorology)
- rain
- rainmaking
- stimulation

## ∞ clouds

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT clouds (meteorology)
- dust
- electron clouds
- exhaust clouds
- H I regions
- H II regions
- hydrogen clouds
- ice clouds
- infrared cirrus (astronomy)
- Magellanic clouds
- magnetic clouds
- meteoroid dust clouds
- molecular clouds
- Oort cloud
- Ophiuchi clouds
- particles
- plasma clouds
- Venus clouds

## clouds (meteorology)

DEF A visible mass of water vapor sus-

pending in the atmosphere above the Earth's surface.

- UF *chaotic cloud patterns*
- GS **clouds (meteorology)**
- . artificial clouds
- . . chemical clouds
- . . . barium ion clouds
- . cap clouds
- . cirrocumulus clouds
- . cirrostratus clouds
- . cirrus clouds
- . cirrus shields
- . convection clouds
- . . arc clouds
- . . cumulonimbus clouds
- . . . anvil clouds
- . . cumulus clouds
- . . . anvil clouds
- . ice clouds
- . nimbostratus clouds
- . noctilucous clouds
- . stratocumulus clouds
- . stratus clouds

- RT acid rain
- Alpine meteorology
- atmospheric correction
- atmospheric moisture
- CALIPSO (Pathfinder satellite)
- CERES (experiment)
- climatology
- cloud cover
- cloud dispersal
- cloud seeding
- ∞ clouds
- CloudSat
- condensation nuclei
- drop size
- FIRE (climatology)
- fog
- fog dispersal
- ISCCP Project
- meteorology
- MISR (radiometry)
- nephanalysis
- precipitation (meteorology)
- shadows
- sky
- thunderstorms
- weather

## Clouds and the Earth's Radiant Energy System

(added May 2007)

USE **CERES (experiment)**

## CloudSat

(added October 2005)

DEF An Earth observing satellite designed to measure those properties of clouds that are critical for understanding their effects on both weather and climate. Its millimeter-wavelength Cloud Profiling Radar (CPR) measures profiles of cloud vertical structure, liquid and ice water content, and cloud optical properties.

- GS artificial satellites
- . scientific satellites
- . . **CloudSat**
- Earth Observing System (EOS)
- . **CloudSat**
- RT aerosols
- Aqua spacecraft
- Aura spacecraft
- CALIPSO (Pathfinder satellite)
- clouds (meteorology)
- Earth observations (from space)
- meteorological satellites
- meteorology
- precipitation (meteorology)
- remote sensing

## cloud-to-cloud discharges

(added August 1999)

- GS electric current
- . electric discharges
- . . lightning
- . . . **cloud-to-cloud discharges**

## cloud-to-ground discharges

(added August 1999)

GS electric current

- . electric discharges
- . . lightning
- . . . **cloud-to-ground discharges**
- RT elves
- sprites (atmospheric physics)
- clumps**
- RT agglomeration
- atomic clusters
- ∞ clusters
- metal clusters
- molecular clusters
- pattern recognition
- regression analysis
- cluster analysis**
- DEF The analysis of data with the object of finding natural groupings within the data either by hand or with the aid of a computer.
- RT classifications
- data mining
- image analysis
- image processing
- pattern recognition
- remote sensing
- statistical analysis
- Cluster Mission**
- (added September 1989)
- GS space missions
- . **Cluster Mission**
- RT Earth magnetosphere
- European space programs
- international cooperation
- ∞ missions
- NASA space programs
- scientific satellites
- SOHO Mission
- solar terrestrial interactions
- solar wind
- space plasmas
- cluster variation method**
- (added July 1997)
- DEF An exact, statistical-mechanical technique for approximating the configurational entropy of a crystalline material, such as an alloy. The method is based on the cluster-cumulant expansion of entropy, that involves the expansion of the thermodynamic quantities of an infinite system in terms of the density matrices of finite groups of lattice sites called clusters. The method, first proposed by Kikuchi, was developed as a theoretical tool for dealing with atomic ordering.
- UF *CVM (solid state)*
- RT binary alloys
- body centered cubic lattices
- face centered cubic lattices
- Hamiltonian functions
- intermetallics
- Ising model
- ∞ methodology
- order-disorder transformations
- phase diagrams
- phase transformations
- solid solutions
- statistical mechanics
- ternary alloys
- ∞ **clusters**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT atomic clusters
- clumps
- galactic clusters
- globular clusters
- metal clusters
- micelles
- molecular clusters
- Pleiades cluster
- Praesepe star clusters
- star clusters
- Virgo galactic cluster
- clutches**
- RT engine parts
- mechanical devices
- mechanical drives
- clutter**
- DEF Atmospheric noise, extraneous signals, etc. which tend to obscure the reception of a desired signal in a radio receiver, radarscope, etc.
- GS echoes
- . radar echoes
- . . **clutter**
- RT airborne radar
- jamming
- radio frequency interference
- space-time adaptive processing
- C-M diagram*
- USE **color-magnitude diagram**
- CMBR (astronomy)*
- (added July 2000)
- USE **cosmic microwave background radiation**
- CMOS**
- DEF The combination of a PMOS (p-type channel metal oxide semiconductor) with an NMOS (n-type channel metal oxide semiconductor). Used for complementary metal oxide semiconductors.
- UF *complementary metal oxide semiconductors*
- GS electronic equipment
- . solid state devices
- . . semiconductor devices
- . . . metal oxide semiconductors
- . . . . **CMOS**
- semiconductors (materials)
- . metal oxide semiconductors
- . . **CMOS**
- RT cascode devices
- ITO (semiconductors)
- latch-up
- CN emission**
- DEF Radio waves emitted from incandescent gaseous cyanide (CN) in space under low pressures at wavelengths characteristic of the elements comprising the gas. Used for cyanide emission.
- UF *cyanide emission*
- GS electromagnetic radiation
- . radio waves
- . . radio emission
- . . . **CN emission**
- emission
- . radio emission
- . . **CN emission**
- RT hydrocyanic acid
- millimeter waves
- radio sources (astronomy)
- cnoidal waves**
- DEF Finite amplitude progressive waves in shallow water having a wave profile represented by the Jacobian elliptic function "CN."
- RT elastic waves
- gravity waves
- shallow water
- solitary waves
- surface waves
- water depth
- water waves
- ∞ waves
- CNSR*
- USE **Rosetta mission**
- CNT (nanotechnology)*
- (added September 2001)
- USE **carbon nanotubes**
- Coachella Valley (CA)**
- GS valleys
- . **Coachella Valley (CA)**
- RT California
- deserts
- coagulation**
- GS **coagulation**
- . blood coagulation
- RT accumulations
- agglomeration
- Aitken nuclei
- blood
- coalescing
- concentrating
- deposition
- embolisms
- fibrin
- flocculating
- flotation
- gelation
- hardening (materials)
- hemorrhages
- lumping
- precipitation (chemistry)
- ∞ separation
- ∞ setting
- settling
- solidification
- thrombopenia
- water treatment
- coal**
- DEF A brown to black combustible sedimentary rock (in the geological sense) composed principally of consolidated and chemically altered plant remains.
- GS fuels
- . chemical fuels
- . . hydrocarbon fuels
- . . . fossil fuels
- . . . . **coal**
- . . . . anthracite
- . . . . lignite
- . . . . solvent refined coal
- resources
- . Earth resources
- . . fossil fuels
- . . . **coal**
- . . . . anthracite
- . . . . lignite
- . . . . solvent refined coal
- rocks
- . sedimentary rocks
- . . carbonaceous rocks
- . . . **coal**
- . . . . anthracite
- . . . . lignite
- . . . . solvent refined coal
- RT ashes
- asphaltenes
- bitumens
- carbonaceous materials
- coal derived gases
- coal derived liquids
- coal gasification
- coal liquefaction
- coal utilization
- coke
- energy policy
- fly ash
- hydropyrolysis
- peat
- regolith
- soils
- strip mining
- synthane
- coal derived gases**
- DEF The gases which are derived from various coal gasification processes.
- RT catalysts
- coal
- coal derived liquids
- coal gasification
- coal utilization
- methane
- synthesis gas
- coal derived liquids**
- DEF Fluid hydrocarbons derived from the liquefaction of coal.
- RT asphaltenes
- catalysts
- coal
- coal derived gases
- coal gasification
- coal liquefaction

## coal gasification

coal utilization

### coal gasification

GS gasification  
. coal gasification  
. . hydrolysis  
RT coal  
coal derived gases  
coal derived liquids  
coal liquefaction  
cracking (chemical engineering)  
energy policy  
fuel cell power plants  
gases  
hydrocarbon fuels  
hydrocracking  
lignite  
methanation  
synthane  
synthesis gas  
volatility

### coal liquefaction

GS phase transformations  
. liquefaction  
. . coal liquefaction  
RT asphaltenes  
coal  
coal derived liquids  
coal gasification  
energy policy  
hydrocarbon fuels  
hydrocracking  
hydrolysis  
lignite  
melting  
solvent refined coal

### coal utilization

GS utilization  
. coal utilization  
RT coal  
coal derived gases  
coal derived liquids  
energy consumption  
energy policy  
energy technology  
hydrocarbon fuels  
lignite  
solvent refined coal

### coalescence

USE **coalescing**

### coalescing

DEF Growing of grains at the expense of the remainder by adsorption or the growth of a phase or particle at the expense of the remainder by absorption or by reprecipitation. Used for coalescence.

UF *coalescence*  
RT agglomeration  
agitation  
coagulation  
concentrating  
flocculating  
magnetic islands  
mixers  
∞ separation  
settling  
thickeners (equipment)

### Coanda effect

RT ∞ attachment  
bubbles  
circulation control airfoils  
∞ effects  
entrainment  
fluid amplifiers  
jet amplifiers  
jet streams (meteorology)  
reattached flow  
∞ separation  
thrust augmentation

### coarseness

RT fineness  
Ostwald ripening  
reflectance  
roughness

surface properties  
surface roughness  
surface stability  
surface temperature

### coastal currents

DEF Ocean currents caused by the approach of waves to coasts at an angle. They flow parallel to and near the shore. Used for littoral currents and longshore currents.

UF *littoral currents*  
*longshore currents*  
GS circulation  
. water circulation  
. . water currents  
. . . ocean currents  
. . . . **coastal currents**  
RT beaches  
coasts  
∞ currents  
gyres  
oceanography  
oceans  
sea truth  
seas  
tides  
wetlands

### coastal dunes

USE **dunes**

### coastal ecology

GS ecology  
. **coastal ecology**  
RT biometeorology  
coasts  
Earth resources  
environment effects  
environments  
marine environments  
marine resources  
oil pollution  
phenology  
thermal pollution  
waterfowl  
wetlands

### coastal marshlands

USE **marshlands**

### coastal plains

GS land  
. plains  
. . **coastal plains**  
landforms  
. plains  
. . **coastal plains**  
RT bars (landforms)  
beaches  
biometeorology  
coasts  
Earth resources  
ecology  
environments  
piedmonts  
wetlands

### coastal ranges (CA)

GS landforms  
. mountains  
. . **coastal ranges (CA)**  
RT California  
Pacific Ocean

### coastal water

GS water  
. nearshore water  
. . **coastal water**  
RT Coastal Zone Color Scanner  
environment effects  
ocean color scanner  
oceans  
sea water  
shellfish  
shorelines  
vadose water  
water depth

wetlands

### Coastal Zone Color Scanner

DEF A spaceborne instrument devoted to the measurement of ocean color. Every parameter is optimized for use over water to the exclusion of other types of sensing.

GS scanners  
. ocean color scanner  
. . **Coastal Zone Color Scanner**  
RT chlorophylls  
coastal water  
colorimetry  
multispectral band scanners  
ocean data acquisitions systems  
oceanographic parameters  
oceanography  
photomapping  
remote sensing  
remote sensors  
satellite imagery  
Sea-viewing Wide Field-of-view  
Sensor  
water color

### coasting flight

DEF The flight of a rocket between burnout of thrust cutoff of one stage and ignition of another, or between burnout and summit altitude or maximum horizontal range.

RT ascent trajectories  
ballistic trajectories  
climbing flight  
cruising flight  
descent trajectories  
∞ flight  
midcourse trajectories  
parabolic flight  
rocket flight  
soaring

### coasts

DEF The strips of land of indefinite width (may be many kilometers) that extend from the low tide line inland to the first major change in landforms.

RT beaches  
Caspian Sea  
coastal currents  
coastal ecology  
coastal plains  
coral reefs  
cusps (landforms)  
dunes  
estuaries  
lagoons  
lakes  
littoral drift  
marine environments  
oceans  
seas  
shorelines  
storm surges  
tidal flats  
upwelling water

### coating

GS **coating**  
. anodizing  
. electroplating  
. encapsulating  
. metallizing  
RT anodic stripping  
coatings  
corrosion prevention  
deposition  
flame plating  
flame spraying  
HVOF thermal spraying  
lining processes  
metal finishing  
metal spraying  
∞ metallurgy  
metalorganic chemical vapor  
deposition  
optical coatings  
plasma spraying  
∞ priming  
sealing  
siliconizing

spraying  
 surface finishing  
 surface properties  
 surface treatment  
 vapor deposition

**coatings**

DEF Liquid, liquefiable or mastic compositions which are converted to a solid protective, decorative, or functional adherent film after application as a thin layer.

GS **coatings**

. antiradar coatings  
 . antireflection coatings  
 . cathodic coatings  
 . electroplating  
 . enamels  
 . encapsulating  
 . glass coatings  
 . glazes  
 . inorganic coatings  
 . . anodic coatings  
 . . ceramic coatings  
 . lacquers  
 . magnetic films  
 . metal coatings  
 . . aluminum coatings  
 . . gold coatings  
 . . nickel coatings  
 . . zinc coatings  
 . metallizing  
 . paints  
 . . pressure sensitive paints  
 . . temperature sensitive paints  
 . plastic coatings  
 . protective coatings  
 . . anodic coatings  
 . . ceramic coatings  
 . . primers (coatings)  
 . . refractory coatings  
 . optical coatings  
 . rubber coatings  
 . sprayed coatings  
 . thermal control coatings  
 . thermochromic coatings  
 . . birefringent coatings

## RT

additives  
 coating  
 composite materials  
 corrosion  
 corrosion prevention  
 coverings  
 cryodeposits  
 deposition  
 deposits  
 diamond films  
 dipping  
 electroless deposition  
 energy absorption films  
 epoxy resins  
 fabrics  
 $\infty$  films  
 finishes  
 flame spraying  
 furan resins  
 hot corrosion  
 impregnating  
 inhibitors  
 laminates  
 Langmuir-Blodgett films  
 $\infty$  layers  
 lining processes  
 linings  
 metal films  
 metal finishing  
 metal spraying  
 $\infty$  metallurgy  
 moisture resistance  
 passivity  
 pavements  
 plasma spraying  
 plasticizers  
 $\infty$  priming  
 protection  
 rusting  
 sealers  
 sealing  
 $\infty$  sheets  
 siliconizing

solvents  
 spraying  
 substrates  
 surface finishing  
 surface properties  
 thin films  
 vapor deposition  
 veneers  
 waterproofing  
 waxes  
 weatherproofing  
 wings

**coaxial cables**

DEF Waveguides consisting of two concentric conductors insulated from each other. Used for coaxial transmission.

UF *coaxial transmission*

GS transmission lines  
 . communication cables  
 . . **coaxial cables**

RT  $\infty$  cables  
 power lines  
 submarine cables  
 waveguides

**coaxial flow**

GS fluid flow  
 . **coaxial flow**  
 RT annular flow  
 annular nozzles  
 axial flow  
 axisymmetric flow  
 flow geometry  
 Hilsch tubes  
 shear flow  
 stratified flow  
 two dimensional flow

**coaxial nozzles**

DEF Class of nozzle configurations in jet aircraft for reducing noise.

RT aircraft noise  
 axial flow  
 fluid flow  
 noise reduction  
 nozzle geometry  
 $\infty$  nozzles  
 supersonic nozzles  
 variable cycle engines

**coaxial plasma accelerators**

GS plasma accelerators  
 . **coaxial plasma accelerators**  
 RT  $\infty$  accelerators  
 magnetic nozzles  
 plasma engines  
 plasma guns

*coaxial transmission*

USE **coaxial cables transmission**

**cobalt**

GS chemical elements  
 . **cobalt**  
 . . cobalt isotopes  
 . . . cobalt 58  
 . . . cobalt 60  
 metals  
 . transition metals  
 . . **cobalt**  
 . . . cobalt isotopes  
 . . . . cobalt 58  
 . . . . cobalt 60  
 RT strategic materials

**cobalt 58**

GS chemical elements  
 . cobalt  
 . . cobalt isotopes  
 . . . **cobalt 58**  
 . . . nuclides  
 . . . isotopes  
 . . . cobalt isotopes  
 . . . . **cobalt 58**  
 . . . . radioactive isotopes  
 . . . . **cobalt 58**  
 metals  
 . transition metals

. . cobalt  
 . . . cobalt isotopes  
 . . . . **cobalt 58**

**cobalt 60**

GS chemical elements  
 . cobalt  
 . . cobalt isotopes  
 . . . **cobalt 60**  
 . . . nuclides  
 . . . isotopes  
 . . . cobalt isotopes  
 . . . . **cobalt 60**  
 . . . radioactive isotopes  
 . . . . **cobalt 60**  
 metals  
 . transition metals  
 . . cobalt  
 . . . cobalt isotopes  
 . . . . **cobalt 60**

**cobalt acetates**

GS acetates  
 . **cobalt acetates**  
 cobalt compounds  
 . **cobalt acetates**  
 esters  
 . **cobalt acetates**

**cobalt alloys**

GS alloys  
 . **cobalt alloys**  
 . . Astroloy (trademark)  
 . . Rene 41  
 . . Rene 63  
 . . Rene 77  
 . . Rene 95  
 RT heat resistant alloys  
 Kovar (trademark)  
 Stellite (trademark)  
 Waspaloy

**cobalt compounds**

GS **cobalt compounds**  
 . cobalt acetates  
 . cobalt fluorides  
 . cobalt oxalates  
 . cobalt oxides  
 . cohenite  
 RT  $\infty$  chemical compounds  
 $\infty$  Group 8 compounds  
 $\infty$  metal compounds

**cobalt fluorides**

GS cobalt compounds  
 . **cobalt fluorides**  
 halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . metal fluorides  
 . . . . **cobalt fluorides**  
 . halides  
 . . fluorides  
 . . . metal fluorides  
 . . . . **cobalt fluorides**  
 . . . metal halides  
 . . . metal fluorides  
 . . . . **cobalt fluorides**

**cobalt isotopes**

GS chemical elements  
 . cobalt  
 . . **cobalt isotopes**  
 . . . cobalt 58  
 . . . cobalt 60  
 . nuclides  
 . . isotopes  
 . . . **cobalt isotopes**  
 . . . . cobalt 58  
 . . . . cobalt 60  
 metals  
 . transition metals  
 . . cobalt  
 . . . **cobalt isotopes**  
 . . . . cobalt 58  
 . . . . cobalt 60

**cobalt oxalates**

GS cobalt compounds  
 . **cobalt oxalates**



**cobalt oxides**

oxalates  
 . **cobalt oxalates**

**cobalt oxides**

GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . **cobalt oxides**  
 cobalt compounds  
 . **cobalt oxides**

**COBE**

USE **Cosmic Background Explorer satellite**

**Cobol**

UF *Common Business Oriented Language*  
 GS languages  
 . programming languages  
 . . **Cobol**  
 RT FORTRAN  
 PL/1

**Cobra Dane (radar)**

DEF Radar installation for monitoring Soviet missiles.  
 GS radar  
 . surveillance radar  
 . . **Cobra Dane (radar)**  
 . tracking radar  
 . . **Cobra Dane (radar)**  
 RT antenna arrays  
 early warning systems  
 missile trajectories  
 radar signatures

**Coccomyces**

GS plants (botany)  
 . fungi  
 . . **Coccomyces**

**cochannel interference**

(added April 2000)  
 DEF Interference caused by multiple, simultaneous transmissions occurring in the same communication channel.  
 GS electromagnetic interference  
 . radio frequency interference  
 . . **cochannel interference**  
 RT channel capacity  
 channel noise  
 intersymbolic interference  
 phase shift keying

**cochlea**

GS anatomy  
 . sense organs  
 . . ear  
 . . . labyrinth  
 . . . . **cochlea**  
 . . . . . Corti organ

*Cock aircraft*

USE **AN-22 aircraft**

*cockpit assistant systems*

(added October 1997)  
 USE **pilot support systems**

**cockpit simulators**

GS simulators  
 . training simulators  
 . . flight simulators  
 . . . **cockpit simulators**  
 training devices  
 . training simulators  
 . . flight simulators  
 . . . **cockpit simulators**  
 RT spacecraft cabin simulators  
 training devices  
 virtual reality

**cockpit weather information systems**

(added August 1996)  
 DEF A cockpit display system that provides flight crews with a graphical display of interactive weather information, including surface observations, terminal forecasts, radar summaries, and lightning strike data. The system also provides weather trend information and has zooming

capabilities that enable the user to see information for the entire nation or to focus on specific areas.

GS information systems  
 . **cockpit weather information systems**  
 RT airborne equipment  
 cockpits  
 display devices  
 flight conditions  
 flight instruments  
 meteorological parameters  
 weather forecasting

**cockpits**

RT aircraft compartments  
 cabin atmospheres  
 ∞ cabins  
 canopies  
 cockpit weather information systems  
 ejection seats  
 flying ejection seats  
 fuselages  
 pilot support systems  
 pressurized cabins  
 space capsules  
 spacecraft cabin atmospheres  
 spacecraft cabins  
 windshields

**cockroaches**

UF *Blattidae*  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **cockroaches**

**cocks**

UF *stopcocks*  
 GS valves  
 . **cocks**  
 RT gas valves  
 hydraulic equipment

*COD (cracks)*

USE **crack opening displacement**

*COD aircraft*

USE **C-2 aircraft**

**code division multiple access**

DEF Multiple access system in which users are segregated by means of pseudorandom signal coding and bandwidth spreading so that the complete time and frequency axes are occupied and only the power is shared. Used for CDMA.

UF *CDMA*  
 GS telecommunication  
 . multiple access  
 . . **code division multiple access**  
 . . radio communication  
 . . radio relay systems  
 . . . **code division multiple access**  
 transmission  
 . signal transmission  
 . . data transmission  
 . . . multiple access  
 . . . . **code division multiple access**  
 RT Aloha system  
 frequency division multiple access  
 multichannel communication  
 multiplexing  
 satellite networks  
 switching  
 wideband communication

**code division multiplexing**

DEF The separation of two or more simultaneous radio transmissions over a common path by signal coding and bandwidth spreading.

GS transmission  
 . multiplexing  
 . . **code division multiplexing**  
 RT data transmission  
 demultiplexing  
 frequency division multiple access  
 radio communication  
 radio transmission

satellite transmission  
 signal transmission  
 telecommunication  
 wavelength division multiplexing

**coders**

UF *encoders*  
 RT analog to digital converters  
 coding  
 decoders  
 programmers

∞ **codes**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 RT BCH codes  
 binary codes  
 biternary code  
 coding  
 color coding  
 concatenated codes  
 cryptography  
 digits  
 error correcting codes  
 error detection codes  
 Morse code  
 Reed-Solomon codes  
 standards  
 symbols  
 trellis coding

**coding**

UF *encoding notation*  
 GS **coding**  
 . decoding  
 . redundancy encoding  
 . signal encoding  
 . . amplitude modulation  
 . . . quadrature amplitude modulation  
 . . . frequency modulation  
 . . . feedback frequency modulation  
 . . . FM/PM (modulation)  
 . . . frequency shift keying  
 . . . pulse frequency modulation  
 . . phase modulation  
 . . . FM/PM (modulation)  
 . . . phase shift keying  
 . . . . binary phase shift keying  
 . . . . quadrature phase shift keying  
 . . . pulse modulation  
 . . . pulse amplitude modulation  
 . . . pulse code modulation  
 . . . delta modulation  
 . . . . differential pulse code modulation  
 . . . . pulse frequency modulation  
 . . . pulse time modulation  
 . . . . pulse duration modulation  
 . . . . pulse position modulation  
 . . trellis coding  
 . Wiswesser notations  
 RT abbreviations  
 addressing  
 alphabets  
 analog to digital converters  
 BCH codes  
 coders  
 ∞ codes  
 color coding  
 computer programming  
 computer programs  
 concatenated codes  
 cryptography  
 data transmission  
 dictionaries  
 digital techniques  
 error detection codes  
 identifying  
 information theory  
 languages  
 parity  
 pulse compression  
 Reed-Solomon codes  
 symbolic programming  
 symbols  
 vector quantization

- Viterbi decoders
- coefficient of friction**  
 UF *friction coefficient*  
 GS coefficients  
 . **coefficient of friction**  
 surface properties  
 . **coefficient of friction**  
 RT friction  
 friction factor  
 friction reduction  
 kinetic friction  
 sliding friction  
 static friction  
 wear resistance
- coefficients**  
 GS **coefficients**  
 . accommodation coefficient  
 . aerodynamic coefficients  
 . attenuation coefficients  
 . binomial coefficients  
 . Clebsch-Gordan coefficients  
 . coefficient of friction  
 . coherence coefficient  
 . correlation coefficients  
 . coupling coefficients  
 . diffusion coefficient  
 . . Soret coefficient  
 . flow coefficients  
 . . discharge coefficient  
 . heat transfer coefficients  
 . hydrodynamic coefficients  
 . influence coefficient  
 . . structural influence coefficients  
 . ionization coefficients  
 . nozzle thrust coefficients  
 . Onsager phenomenological coefficient  
 . recombination coefficient  
 . regression coefficients  
 . scattering coefficients  
 . virial coefficients  
 . Wigner coefficient  
 RT  $\infty$  constant  
 constants  
 mechanical properties  
 optical properties  
 polynomials  
 Racah coefficient  
 statistical analysis  
 $\infty$  weight
- coenzymes**  
 GS organic compounds  
 . **coenzymes**  
 . . adenosine diphosphate  
 . . adenosine triphosphate  
 . . cyclic AMP  
 . . glutathione  
 . . thiamine  
 RT enzymes
- coercivity**  
 RT magnetic properties  
 magnetization
- coesite**  
 DEF A polymorph of silicon dioxide.  
 GS chalcogenides  
 . oxides  
 . . dioxides  
 . . . silicon dioxide  
 . . . . quartz  
 . . . . **coesite**  
 . . silicon oxides  
 . . . silicon dioxide  
 . . . . quartz  
 . . . . **coesite**  
 minerals  
 . quartz  
 . . **coesite**  
 silicon compounds  
 . silicon oxides  
 . . silicon dioxide  
 . . . quartz  
 . . . . **coesite**  
 RT Earth crust  
 Earth mantle  
 meteorites
- rutile  
 stishovite  
 stony meteorites  
 tektites
- coffee**  
 GS farm crops  
 . **coffee**  
 RT beverages
- Coffin-Manson law**  
 DEF A relationship which enables one to estimate the fatigue life from the cyclic plastic strain range. The specific life for a given metal or alloy is determined by its tensile ductility.  
 GS laws  
 . **Coffin-Manson law**  
 RT crack propagation  
 fatigue life  
 fatigue tests  
 metal fatigue
- cogeneration**  
 DEF The generation of electricity or shaft power by an energy conversion system and the concurrent use of the rejected thermal energy from the conversion system as an auxiliary energy source.  
 RT electric generators  
 electric power plants  
 energy conversion  
 $\infty$  generation  
 heat generation  
 $\infty$  power plants  
 solar energy conversion  
 thermal energy  
 waste energy utilization
- cognition**  
 RT artificial intelligence  
 cognitive psychology  
 decision making  
 identifying  
 IFF systems (identification)  
 information processing (biology)  
 knowledge representation  
 perception
- cognitive psychology**  
 GS psychology  
 . **cognitive psychology**  
 RT cognition  
 information processing (biology)  
 intelligence  
 mental performance
- COGO (programming language)**  
 UF *coordinate geometry language*  
 GS languages  
 . programming languages  
 . . **COGO (programming language)**
- cohenite**  
 GS cobalt compounds  
 . **cohenite**  
 iron compounds  
 . **cohenite**  
 minerals  
 . **cohenite**  
 nickel compounds  
 . **cohenite**
- $\infty$  **coherence**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT coherent radiation  
 coherent scattering  
 cohesion  
 congruences  
 elastic scattering  
 intelligibility  
 laser outputs  
 lasers  
 maser outputs  
 phase coherence  
 wave dispersion  
 wave propagation
- coherence coefficient**  
 GS coefficients
- . **coherence coefficient**  
 RT coherent radar  
 coherent radiation  
 $\infty$  interference  
 noise propagation  
 phase coherence  
 stochastic processes
- coherent acoustic radiation**  
 GS coherent radiation  
 . **coherent acoustic radiation**  
 elastic waves  
 . **coherent acoustic radiation**  
 RT  $\infty$  radiation  
 ultrasonic radiation  
 underwater acoustics
- coherent anti-Stokes Raman spectroscopy*  
 USE **Raman spectroscopy**
- coherent electromagnetic radiation**  
 GS coherent radiation  
 . **coherent electromagnetic radiation**  
 radiation  
 . . coherent light  
 . . laser beams  
 electromagnetic radiation  
 . **coherent electromagnetic radiation**  
 radiation  
 . . coherent light  
 . . laser beams  
 RT beams (radiation)  
 holography  
 infrared radiation  
 interstellar masers  
 ionizing radiation  
 krypton fluoride lasers  
 lasers  
 light (visible radiation)  
 masers  
 modulated continuous radiation  
 monochromatic radiation  
 quantum electronics  
 $\infty$  radiation  
 radio waves  
 squeezed states (quantum theory)  
 stimulated emission  
 stimulated emission devices  
 traveling wave masers  
 ultraviolet radiation
- coherent light**  
 DEF Light in which the phase relationship between points in a beam remains constant throughout the beam.  
 GS coherent radiation  
 . coherent electromagnetic radiation  
 . . **coherent light**  
 electromagnetic radiation  
 . coherent electromagnetic radiation  
 . . **coherent light**  
 . light (visible radiation)  
 . . **coherent light**  
 RT four-wave mixing  
 gamma ray lasers  
 HCN lasers  
 holographic interferometry  
 holography  
 laser outputs  
 lasers  
 monochromatic radiation  
 neodymium lasers  
 optical computers  
 optical memory (data storage)  
 phase coherence  
 plasmadynamic lasers  
 rare gas-halide lasers  
 scatter plates (optics)  
 Shiva laser system  
 speckle holography  
 squeezed states (quantum theory)  
 stimulated emission  
 two-wavelength lasers  
 ultraviolet lasers
- coherent radar**  
 DEF A type of radar that employs circuitry which permits comparison of the phase of successive received target signals.  
 GS radar

## coherent radiation

**. coherent radar**  
RT coherence coefficient  
continuous wave radar  
Doppler radar  
moving target indicators  
pulse Doppler radar  
pulse radar  
radar detection  
search radar  
surveillance radar  
tracking radar

**coherent radiation**  
UF *coherent sources*  
*coherent transmission*  
GS **coherent radiation**  
. coherent acoustic radiation  
. coherent electromagnetic radiation  
. . coherent light  
. . laser beams  
RT beams (radiation)  
∞ coherence  
coherence coefficient  
continuous radiation  
corpuscular radiation  
elastic waves  
electromagnetic radiation  
light (visible radiation)  
optical properties  
∞ radiation  
∞ rays  
wave propagation

**coherent scattering**  
DEF Scattering of photons or particles in which there are definite phase relationships between the incoming and scattered waves. Ordinary scattering is coherent. With coherent scattering, interference occurs between the waves scattered by two or more scattering centers. The total intensity is the vector sum of the amplitudes of the various waves.  
GS scattering  
. **coherent scattering**  
RT ∞ coherence  
Compton effect  
elastic scattering  
incoherent scattering  
inelastic scattering  
nuclear scattering

*coherent sources*  
USE **coherent radiation**  
**radiation sources**

*coherent transmission*  
USE **coherent radiation**

**cohesion**  
DEF The mutual attraction by which elements of a substance are held together.  
RT agglutination  
bonding  
∞ coherence  
internal friction  
internal pressure  
plastic properties  
spreading

*cohomology*  
USE **homology**

*COIL (lasers)*  
(added August 1997)  
USE **chemical oxygen-iodine lasers**

∞ **coils**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT electric coils  
inductors  
magnet coils  
magnetic coils  
springs (elastic)  
toroids  
wire

**COIN aircraft**  
UF *counterinsurgency aircraft*  
*LARA aircraft*

*light armed reconnaissance aircraft*  
GS attack aircraft  
. **COIN aircraft**  
. . F-5 aircraft  
. . OV-10 aircraft  
RT ∞ aircraft  
light intratheater transport

**coincidence circuits**  
DEF Circuits that produce a usable output only when each of two or more input circuits receive pulses simultaneously or within an assignable time interval.  
GS circuits  
. **coincidence circuits**  
RT anticoincidence detectors  
gates (circuits)  
radiation counters  
synchronism

**coining**  
GS forming techniques  
. pressing (forming)  
. . **coining**  
metal working  
. **coining**  
RT cold pressing  
cold working  
dies  
forging  
hot isostatic pressing  
hot pressing  
sizing (shaping)  
stamping

**coke**  
GS fuels  
. **coke**  
RT bitumens  
carbon  
charcoal  
coal  
lignite

*Coke aircraft*  
USE **AN-24 aircraft**

**colchicine**  
GS bases (chemical)  
. alkaloids  
. . **colchicine**  
nitrogen compounds  
. alkaloids  
. . **colchicine**  
organic compounds  
. cyclic compounds  
. . cyclic hydrocarbons  
. . . **colchicine**  
. . heterocyclic compounds  
. . . alkaloids  
. . . . **colchicine**  
. hydrocarbons  
. . cyclic hydrocarbons  
. . . **colchicine**

**cold acclimatization**  
GS adaptation  
. acclimatization  
. . **cold acclimatization**  
RT heat acclimatization  
subzero temperature

*cold blooded animals*  
USE **poikilothermia**

**Cold Bokkeveld meteorite**  
GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . carbonaceous meteorites  
. . . . carbonaceous chondrites  
. . . . . **Cold Bokkeveld meteorite**  
. . . chondrites  
. . . . carbonaceous chondrites  
. . . . . **Cold Bokkeveld meteorite**

**cold cathode tubes**  
DEF Electron tubes containing cold cathodes.  
GS electron tubes

**. cold cathode tubes**  
. . phototubes  
. . . photomultiplier tubes  
. . . . frequency modulation  
photomultipliers  
RT cathodes  
electrodes  
gas discharges  
∞ gas tubes  
tube cathodes  
tunnel cathodes

**cold cathodes**  
DEF Cathodes that function without the application of heat.  
GS electrodes  
. cathodes  
. . tube cathodes  
. . . **cold cathodes**  
RT gas discharges  
tunnel cathodes

**cold drawing**  
DEF Reducing the cross section (of wire) by pulling through a die or dies, at a temperature lower than the recrystallization temperature.  
RT deep drawing  
∞ drawing  
metal drawing

**cold flow tests**  
SN (EXCLUDES MECHANICAL CREEP, TESTS)  
DEF Tests of liquid rockets without firing them to check or verify the efficiency of a propulsion subsystem, providing for the conditioning and flow of propellants (including tank pressurization, propellant loading, and propellant feeding).  
GS engine tests  
. **cold flow tests**  
ground tests  
. **cold flow tests**  
RT checkout  
feed systems  
plastic properties  
prelaunch tests  
propellant tests  
propulsion system performance  
rocket engine design  
static tests  
∞ tests

*cold forming*  
USE **cold working**

**cold fronts**  
GS fronts (meteorology)  
. **cold fronts**  
RT air masses  
∞ fronts  
meteorological parameters  
meteorology  
storms  
synoptic meteorology  
thunderstorms  
tornadoes  
warm fronts  
weather forecasting

**cold gas**  
GS gases  
. **cold gas**  
RT attitude control  
gas jets  
jet thrust

**cold hardening**  
SN (LIMITED TO HARDENING OF MATERIALS BY COOLING TO VERY LOW TEMPERATURES-- EXCLUDES PRECIPITATION HARDENING AT OR NEAR ROOM TEMPERATURE AND HARDENING VIA COLD WORKING)  
GS hardening (materials)  
. **cold hardening**  
RT brittleness  
hardness  
phase transformations  
precipitation hardening

- work hardening
- cold neutrons**  
 DEF Neutrons of less velocity than thermal neutrons; at 152 deg. C their energy is below 0.01 eV.  
 GS particles  
 . elementary particles  
 . . fermions  
 . . . neutrons  
 . . . . **cold neutrons**  
 . neutral particles  
 . . neutrons  
 . . . **cold neutrons**  
 RT baryons
- cold plasmas**  
 UF *low temperature plasmas*  
 GS particles  
 . charged particles  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **cold plasmas**  
 . corpuscular radiation  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **cold plasmas**  
 RT collisionless plasmas  
 rarefied plasmas
- cold pressing**  
 RT coining  
 compacting  
 hot isostatic pressing  
 hot pressing  
 metal working  
 ∞ pressing  
 pressing (forming)  
 upsetting
- cold rolling**  
 GS forming techniques  
 . cold working  
 . . **cold rolling**  
 RT metal working
- cold strength**  
 GS mechanical properties  
 . **cold strength**  
 RT high temperature tests  
 low temperature environments  
 low temperature tests  
 ∞ strength
- cold surfaces**  
 UF *cold walls*  
 RT cryogenic fluid storage  
 ∞ surfaces
- cold tolerance**  
 GS tolerances (physiology)  
 . **cold tolerance**  
 RT body temperature  
 exposure  
 frostbite  
 heat tolerance  
 homeostasis  
 subzero temperature  
 thermoregulation  
 vasoconstriction
- cold traps**  
 GS traps  
 . **cold traps**  
 RT condensers (liquefiers)  
 cryogenic temperature  
 cryogenics  
 cryotrapping  
 freezing  
 refrigerating  
 vacuum apparatus  
 vapor traps
- cold walls*  
 USE **cold surfaces**  
**walls**
- cold water**  
 GS water  
 . **cold water**
- RT potable water
- cold weather**  
 GS weather  
 . **cold weather**  
 RT frost damage  
 low temperature environments  
 pressure ice  
 snow cover  
 subzero temperature  
 weatherproofing  
 winter
- cold weather tests**  
 GS environmental tests  
 . **cold weather tests**  
 RT high temperature tests  
 low temperature tests  
 ∞ tests
- cold welding**  
 GS welding  
 . pressure welding  
 . . **cold welding**  
 RT adhesion  
 bonding  
 high vacuum  
 vacuum effects
- cold working**  
 DEF Deforming metal plasticity at a temperature lower than the recrystallization temperature. Used for cold forming.  
 UF *cold forming*  
 GS forming techniques  
 . **cold working**  
 . . cold rolling  
 . . electrohydraulic forming  
 . . explosive forming  
 RT cladding  
 coining  
 deep drawing  
 extruding  
 forging  
 ∞ joining  
 magnetic forming  
 metal drawing  
 metal spinning  
 metal working  
 peening  
 roll forming  
 shearing  
 shot peening  
 stamping  
 stretch forming  
 stretching  
 swaging  
 temper (metallurgy)  
 upsetting  
 winding
- Coleoptera**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **Coleoptera**  
 . . . . . beetles  
 . . . . . tribolia  
 . . . . . boll weevils
- colic**  
 GS diseases  
 . **colic**  
 RT gastrointestinal system  
 intestines
- collagens**  
 RT bone mineral content  
 connective tissue  
 gelatins  
 leather  
 proteins  
 skin (anatomy)
- collapse**  
 GS **collapse**  
 . gravitational collapse  
 RT buckling  
 deformation
- failure  
 structural failure
- collating**  
 RT binding  
 compilers  
 correlation  
 insertion  
 position (location)  
 positioning
- collection**  
 RT accumulations  
 acquisition  
 assembling  
 input  
 lumping  
 museums  
 ∞ receiving  
 sampling  
 selection  
 stockpiling
- collectors*  
 USE **accumulators**
- colleges*  
 USE **universities**
- collimation**  
 GS **collimation**  
 . beamforming  
 adjusting  
 alignment  
 beam steering  
 directivity  
 four-wave mixing  
 microbeams  
 ∞ orientation  
 polarization (waves)
- collimators**  
 DEF Optical devices which render rays of light parallel. Used for autocollimators.  
 UF *autocollimators*  
 GS optical equipment  
 . **collimators**  
 RT beam waveguides  
 mirrors  
 optical measurement
- collinearity**  
 GS analysis (mathematics)  
 . calculus  
 . . vector analysis  
 . . . **collinearity**  
 . . . real variables  
 . . . vector analysis  
 . . . . **collinearity**  
 geometry  
 . vector analysis  
 . . **collinearity**  
 linearity  
 . **collinearity**
- collision avoidance**  
 UF *collision warning devices*  
 GS avoidance  
 . **collision avoidance**  
 . . Beacon Collision Avoidance System  
 RT air navigation  
 air traffic  
 air traffic control  
 aircraft approach spacing  
 aircraft guidance  
 aircraft safety  
 airspace  
 approach control  
 automatic traffic advisory and resolution  
 collisions  
 flight paths  
 flight rules  
 flight safety  
 midair collisions  
 National Airspace Utilization System  
 radar  
 radar navigation  
 radio navigation

## collision parameters

- runway incursions
- threat evaluation
- traffic control
- visual flight
- warning
- warning systems

### collision parameters

DEF In orbit computation, the distances between centers of attraction of central force fields and the extension of velocity vectors of moving objects at great distances from the centers. In gas dynamics and atomic physics, any of several parameters such as cross section, collision rate, mean free path, etc., which provide a measure of the probability of collision.

#### GS collision parameters

- . collision rates

#### RT ∞ absorption

- beam interactions

#### ∞ cross sections

- mean free path
- nuclear interactions
- particle interactions
- particle theory
- scattering

### collision rates

DEF Ratios defined by the average number of collisions per second suffered by a molecule or other particle moving through a gas.

#### GS collision parameters

- . **collision rates**

- rates (per time)

- . **collision rates**

*collision warning devices*

USE **collision avoidance warning systems**

### collisional plasmas

#### GS particles

- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **collisional plasmas**
- . . . . . strongly coupled plasmas
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **collisional plasmas**
- . . . . . strongly coupled plasmas

#### RT electron runaway (plasma physics)

- high temperature plasmas
- nuclear fusion
- plasma conductivity
- plasma density
- plasma waves

### collisionless plasmas

#### GS particles

- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **collisionless plasmas**
- . . . . . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **collisionless plasmas**

#### RT cold plasmas

- ionic waves
- Kelvin-Helmholtz instability
- low density research
- magnetic islands
- rarefied plasmas

### collisions

#### GS collisions

- . atomic collisions
- . cometary collisions
- . Coulomb collisions
- . inelastic collisions
- . ionic collisions
- . meteorite collisions
- . midair collisions
- . . bird-aircraft collisions
- . . asteroid collisions
- . molecular collisions
- . particle collisions

#### RT air bag restraint devices

- air traffic control
- aircraft accidents
- aircraft hazards
- aircraft safety
- collision avoidance
- crashes
- flight hazards
- flight paths
- gas atomization
- impact velocity
- pilot error
- recoilings
- runway incursions
- scattering

### collocation

#### RT assemblies

- ∞ assembly
- congruences
- position (location)
- positioning

### colloidal generators

#### RT atomizing

- dispersions
- ∞ generators
- plasma diffusion
- plasma generators
- sprayers
- vaporizers

### colloidal propellants

#### UF cordite

#### GS mixtures

- . dispersions
- . . colloids
- . . . **colloidal propellants**
- propellants
- . **colloidal propellants**

- RT gelled propellants
- slurry propellants
- solid propellants
- solid suspensions

*colloidal suspensions*

(added May 2001)

USE **colloids**

### colloiding

#### UF lyophilization

#### GS mixing

- . **colloiding**
- RT agitation
- atomizing
- colloids
- comminution
- compounding
- dispersing
- flocculating
- gelation
- homogenizing
- precipitation (chemistry)
- suspending (mixing)

### colloids

#### UF *colloidal suspensions*

*lyophils*

#### GS mixtures

- . dispersions
- . . **colloids**
- . . . aerosols
- . . . . fog
- . . . . colloidal propellants

- RT Brownian movements
- clays
- colloiding
- electrodialysis
- electrophoresis
- emulsions
- foams
- gels
- homeostasis
- micelles
- nonNewtonian fluids
- particles
- plastisols
- ∞ separation

### Colombia

GS nations

### . Colombia

RT Llanos Orientales (Colombia)  
Magdalena-Cauca Valley (Colombia)  
South America

### colonies

RT bacteria  
bacteriology

### color

#### UF coloration

#### GS electromagnetic properties

- . optical properties

- . . **color**

- . . . iridescence

- . . . . stellar color

- . . . . water color

#### RT brightness

- chromophores
- colorimetry
- contrast
- darkness
- dichroism
- discoloration
- electrochromism
- fading
- human factors engineering
- incandescence
- isochromatics
- light (visible radiation)
- perception
- phototropism
- ∞ physical properties
- prewhitening
- spectra
- surface properties
- symbols
- thermochromatic materials
- vegetative index
- visibility
- vision
- wave dispersion

*color (particle physics)*

USE **quantum chromodynamics**

### color centers

#### UF F centers

#### RT ∞ centers

- Franck-Condon principle

### color coding

DEF Any system of colors used for purposes of identification. Used for color enhancement.

#### UF color enhancement

#### RT ∞ codes

- coding

*color enhancement*

USE **color coding**

### color infrared photography

DEF A representation of temperature differences using false colors.

#### GS imagery

- . photography
- . . multispectral photography
- . . . infrared photography
- . . . . **color infrared photography**

#### RT color photography

- infrared imagery

*color perception*

USE **color vision**

### color photography

#### GS imagery

- . photography
- . . **color photography**
- RT aerial photography
- black and white photography
- cinematography
- color infrared photography
- orthophotography
- photochromism
- photomapping
- shadowgraph photography
- stereophotography
- ultraviolet photography

underwater photography

### color television

- GS telecommunication
  - . **color television**
  - television systems
  - . **color television**
- RT closed circuit television
  - communicating
  - communication equipment
  - educational television
  - satellite television
  - spacecraft television
  - stereotelevision
  - television reception
  - television transmission

### color vision

- UF *color perception*
- GS vision
  - . **color vision**
- RT eye (anatomy)
  - Young-Helmholtz theory

### Colorado

- GS nations
  - . United States
  - . . **Colorado**
- RT Colorado Plateau (US)
  - Colorado River (North America)
  - Manitou (CO)
  - Pike's Peak (CO)
  - San Juan Mountains (CO)

### Colorado Plateau (US)

- GS land
  - . **Colorado Plateau (US)**
  - landforms
    - . terraces (landforms)
    - . . plateaus
    - . . . **Colorado Plateau (US)**
- RT Arizona
  - Colorado
  - highlands
  - New Mexico
  - Utah

### Colorado River (North America)

- GS rivers
  - . **Colorado River (North America)**
- RT Arizona
  - Colorado
  - Mexico
  - Utah

### coloration

USE **color**

### color-color diagram

DEF A two-axis coordinate graph showing the distribution of stars or other objects with reference to different color indices.

- GS diagrams
  - . **color-color diagram**
- RT color-magnitude diagram
  - Hertzsprung-Russell diagram
  - stellar color
  - stellar spectra
  - stellar spectrophotometry
  - UBV spectra

### colorimetry

- GS optical measurement
  - . **colorimetry**
- RT chemical analysis
  - chromatography
  - Coastal Zone Color Scanner
  - color
  - electrophotometry
  - liquid chromatography
  - ocean color scanner
  - optical measuring instruments
  - photometry
  - spectrophotometry
  - spectroscopy
  - thermochromatic materials

### color-magnitude diagram

DEF The plot of the absolute or apparent magnitude against the color index for a group of

stars. Also known as C-M diagram. Used for C-M diagram.

- UF *C-M diagram*
- GS diagrams
  - . **color-magnitude diagram**
- RT asymptotic giant branch stars
  - color-color diagram
  - globular clusters
  - Hertzsprung-Russell diagram
  - horizontal branch stars
  - main sequence stars
  - star clusters
  - stellar color
  - stellar evolution
  - stellar magnitude

### cols

USE **gaps (geology)**

### Columbia (Orbiter)

- UF *Space Shuttle Orbiter 102*
- GS manned spacecraft
  - . space shuttles
  - . . Space Shuttle orbiters
  - . . . **Columbia (Orbiter)**
  - reentry vehicles
    - . recoverable spacecraft
    - . . reusable spacecraft
    - . . . space shuttles
    - . . . . Space Shuttle orbiters
    - . . . . . **Columbia (Orbiter)**
- RT manned space flight
  - Space Shuttle mission 31-A
  - Space Shuttle mission 41-A
  - Space Shuttle mission 61-A
  - Space Shuttle mission 61-C
  - Space Shuttle mission 61-E
  - ∞ spacecraft

### Columbia River Basin (ID-OR-WA)

- GS landforms
  - . structural basins
  - . . river basins
  - . . . **Columbia River Basin (ID-OR-WA)**
- RT Idaho
  - Oregon
  - ivers
  - Washington

### columbium

USE **niobium**

### Columbus module

(added December 2007)

DEF Permanent laboratory module of the International Space Station developed by the European Space Agency. The module accommodates both internal and external experiment racks for conducting multidisciplinary research into material science, fluid physics, and the life sciences.

- GS laboratories
  - . space laboratories
  - . . manned orbital laboratories
  - . . . **Columbus module**
  - manned spacecraft
    - . manned orbital laboratories
    - . . **Columbus module**
    - modules
      - . space station modules
      - . . **Columbus module**
- RT Columbus space station
  - European Space Agency
  - International Space Station
  - spaceborne experiments

### Columbus space station

SN (LIMITED TO THE AUTONOMOUS ESA SPACE STATION. FOR REFERENCES TO THE INTERNATIONAL SPACE STATION MODULE USE COLUMBUS MODULE.)

DEF A manned orbital platform originally planned by the European Space Agency to be a fully autonomous space station. This planned station was later superseded by the 'Columbus module' that became the Agency's largest contribution to the International Space Station.

- GS artificial satellites
  - . space stations
  - . . **Columbus space station**

ESA spacecraft
 

- . **Columbus space station**
- manned spacecraft
- . **Columbus space station**
- space platforms
- . **Columbus space station**
- stations
  - . space stations
  - . . **Columbus space station**

 RT AEPS
 

- Automated Transfer Vehicle
- bioastronautics
- Columbus module
- ferry spacecraft
- International Space Station
- intraorbit transfer vehicles
- large space structures
- man tended free flyers
- manned orbital laboratories
- military spacecraft
- orbital servicing
- rendezvous spacecraft
- shape control
- space shuttles
- Space Station Freedom
- space station polar platforms

### ∞ columns

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT columns (process engineering)
  - columns (supports)

### columns (process engineering)

- RT absorbers (equipment)
  - chemical reactors
- ∞ columns
  - concentrators
  - condensers (liquefiers)
  - contactors
  - contractors
  - dehydration
  - dehydrogenation
  - distillation equipment
  - drying apparatus
  - extraction
  - scrubbers
  - separators
  - vaporizers

### columns (supports)

- GS structural members
  - . **columns (supports)**
  - . . tapered columns
- RT beams (supports)
  - ∞ columns
    - pylon mounting
    - pylons
    - struts
    - studs (structural members)
    - Timoshenko beams
    - towers

### ∞ coma

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aberration
  - blackout (physiology)
  - blackout prevention
  - comet heads
  - comet nuclei
  - comet tails
  - cometary atmospheres
  - comets
  - Grigg-Skjellerup comet
  - Kohoutek comet
  - screen effect
  - Tempel 2 comet
  - unconsciousness

### combat

- GS military operations
  - . **combat**
  - warfare
  - . **combat**
- RT aircraft survivability
  - B-1 aircraft

## combination

electronic warfare

### ∞ combination

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT admixtures  
consolidation  
mixtures  
permutations

### combinations (mathematics)

GS analysis (mathematics)  
. combinatorial analysis  
. . . **combinations (mathematics)**  
RT partitions (mathematics)  
permutations

### combinatorial analysis

GS analysis (mathematics)  
. **combinatorial analysis**  
. . binomial coefficients  
. . combinations (mathematics)  
. . factorials  
. . partitions (mathematics)  
. . permutations  
RT ∞ analyzing  
∞ applications of mathematics  
graph theory  
information theory  
number theory  
probability theory  
set theory

### combined cycle power generation

DEF Power generation which combines an open-cycle gas turbine and a closed-cycle steam turbine.

RT electric generators  
electric power plants  
energy technology  
gas turbines  
steam turbines

*Combined Release and Radiation Effects Sat*

USE **CRRES (satellite)**

### combined stress

GS stresses  
. **combined stress**  
RT fatigue life  
stress analysis  
stress concentration  
stress intensity factors

*combustibility*

USE **flammability**

### combustible flow

GS fluid flow  
. reacting flow  
. . **combustible flow**  
RT boundary layer combustion  
combustion physics  
combustion products  
detonation waves  
dump combustors  
flame propagation  
fuel flow  
turbulent combustion  
turbulent flames  
turbulent flow

### combustion

DEF A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light either as a glow or flames. Some oxidation such as that of hydrogen emits radiation outside the visible spectrum. Used for burning and burning process.

UF *burning*  
*burning process*

GS **combustion**  
. afterburning  
. boundary layer combustion  
. deflagration  
. erosive burning  
. fuel combustion  
. . nuclear fuel burnup  
. hydrocarbon combustion  
. hypersonic combustion

. metal combustion  
. propellant combustion  
. . solid propellant combustion  
. . . solid propellant ignition  
. biomass burning  
. smoldering  
. spontaneous combustion  
. supersonic combustion  
. turbulent combustion

RT

backfire  
burning rate  
burning time  
burnout  
charring  
chemical explosions  
combustion chambers  
combustion chemistry  
combustion control  
combustion efficiency  
combustion physics  
combustion products  
combustion stability  
combustion synthesis  
combustion temperature  
combustion vibration  
detonation  
diffusion flames  
exothermic reactions  
explosions  
extinguishing  
fire damage  
firebreaks  
fires  
flame propagation  
flameout  
flames  
flammability  
flashback  
forest fires  
heat balance  
heat generation  
ignition  
ignition limits  
incendiary ammunition  
internal combustion engines  
oxidation  
∞ physics  
quenching (cooling)  
spark ignition  
supersonic combustion ramjet engines

### combustion chambers

DEF Containers in which the actual burning of fuel takes place. Used for combustors.

UF *combustors*

GS **combustion chambers**

. dump combustors  
RT burners  
∞ chambers  
combustion  
engine parts  
engines  
flame holders  
flameout  
furnaces  
internal combustion engines  
jet engines  
pistons  
refractories  
spark plugs  
thrust chambers

### combustion chemistry

DEF The study of the exothermic oxidation reactions occurring immediately before and during combustion.

GS thermochemistry  
. **combustion chemistry**  
RT chain reactions (chemistry)  
chemical engineering  
chemical reactions  
∞ chemistry  
combustion  
combustion physics  
combustion products  
combustion stability  
combustion synthesis  
exothermic reactions

flame temperature  
oxidation  
reacting flow  
reaction kinetics

### combustion control

DEF Control of factors (temperature, preheating, draft, excess or deficient air, etc.) which affects combustion efficiency.

RT automatic control  
burning rate  
combustion  
∞ control  
engine control  
fuel control  
temperature control

### combustion efficiency

DEF The efficiency with which fuel is burned, expressed as the ratio of the actual energy released by the combustion to the potential chemical energy of the fuel.

GS efficiency  
. **combustion efficiency**  
RT ACEE program  
burning rate  
burning time  
combustion  
dump combustors  
exhaust gases  
fuel combustion  
fuel consumption  
fuel-air ratio  
power efficiency  
propellant combustion  
propellant consumption  
propulsion system performance  
propulsive efficiency  
thermodynamic efficiency

*combustion heat*

USE **heat of combustion**

*combustion instability*

USE **combustion stability**

### combustion physics

GS thermodynamics  
. **combustion physics**  
RT aerothermodynamics  
combustible flow  
combustion  
combustion chemistry  
Damkohler number  
flame propagation  
heat of combustion  
ignition  
∞ physics  
plasmas (physics)  
reaction-diffusion equations  
∞ science  
thermochemistry  
turbulent combustion

### combustion products

GS products  
. reaction products  
. . **combustion products**  
. . . soot  
RT air pollution  
ashes  
biomass burning  
combustible flow  
combustion  
combustion chemistry  
dilutents  
dust  
exhaust gases  
flue gases  
fly ash  
high temperature gases  
odors  
particulates  
pollution transport  
polycyclic aromatic hydrocarbons  
rocket exhaust  
smog  
smoke  
vapors

- wastes
- combustion stability**  
 UF *acoustic combustion chugging*  
*combustion instability*  
 GS dynamic characteristics  
 . dynamic stability  
 . . **combustion stability**  
 . . . flame stability  
 stability  
 . dynamic stability  
 . . **combustion stability**  
 . . . flame stability  
 RT axial modes  
 burning rate  
 combustion  
 combustion chemistry  
 fuel combustion  
 motion stability  
 pressure oscillations  
 propellant combustion  
 smoldering  
 solid propellant combustion  
 thermal instability  
 thermoacoustic effects  
 turbulent combustion  
 velocity coupling
- combustion synthesis**  
*(added April 1993)*  
 RT annealing  
 cermets  
 combustion  
 combustion chemistry  
 exothermic reactions  
 functionally gradient materials  
 powder metallurgy  
 sintering
- combustion temperature**  
 GS temperature  
 . **combustion temperature**  
 RT combustion  
 erosive burning  
 flame temperature  
 flash point  
 ignition temperature  
 operating temperature  
 spontaneous combustion
- combustion vibration**  
 GS vibration  
 . **combustion vibration**  
 RT combustion  
 elastic waves  
 structural stability
- combustion waves*  
 USE **flame propagation**
- combustion wind tunnels**  
 GS test facilities  
 . wind tunnels  
 . . **combustion wind tunnels**  
 RT hypersonic wind tunnels  
 hypervelocity wind tunnels
- combustors*  
 USE **combustion chambers**
- Comet 4 aircraft**  
 UF *de Havilland DH 106 aircraft*  
*DH 106 aircraft*  
 GS commercial aircraft  
 . **Comet 4 aircraft**  
 de Havilland aircraft  
 . **Comet 4 aircraft**  
 Hawker Siddeley aircraft  
 . **Comet 4 aircraft**  
 jet aircraft  
 . **Comet 4 aircraft**  
 monoplanes  
 . **Comet 4 aircraft**  
 passenger aircraft  
 . **Comet 4 aircraft**  
 RT  $\infty$  aircraft
- comet heads**  
 GS celestial bodies
- . **comet heads**  
 RT  $\infty$  coma  
 cometary atmospheres  
 solar system
- comet nuclei**  
 GS celestial bodies  
 . **comet nuclei**  
 RT  $\infty$  coma  
 Comet Nucleus Tour  
 cometary atmospheres  
 Oort cloud  
 Rosetta mission  
 solar system  
 Stardust Mission
- Comet Nucleus Tour**  
*(added February 1999)*  
 DEF A NASA Discovery-class mission to acquire imagery and comparative spectral maps of comet nuclei and analyze comet dust flows. The mission spacecraft will fly to within 100 kilometers of at least three near-Earth comets including Comet Encke, Comet Schwassmann-Wachmann, and Comet d'Arrest.  
 UF *CONTOUR (mission)*  
 GS space missions  
 . flyby missions  
 . . **Comet Nucleus Tour**  
 RT comet nuclei  
 Encke comet  
 Schwassmann-Wachmann comet  
 swingby technique
- Comet Rendezvous Asteroid Flyby Mission**  
*(added November 1988)*  
 UF *CRAF mission*  
 GS space missions  
 . asteroid missions  
 . . **Comet Rendezvous Asteroid Flyby Mission**  
 . flyby missions  
 . . **Comet Rendezvous Asteroid Flyby Mission**  
 RT Mariner Mark 2 Spacecraft  
 $\infty$  missions  
 NASA space programs  
 Near Earth Asteroid Rendezvous Mission  
 Rosetta mission
- comet tails**  
 GS celestial bodies  
 . **comet tails**  
 RT  $\infty$  coma  
 cometary atmospheres  
 Grigg-Skjellerup comet  
 radiation pressure  
 solar system  
 solar wind
- cometary atmospheres**  
 DEF The region of the coma of a comet as well as the gaseous part surrounding the coma that often is a hydrogen atmosphere that contains particulate matter.  
 RT astronomical photometry  
 $\infty$  atmospheres  
 $\infty$  coma  
 comet heads  
 comet nuclei  
 comet tails  
 cometary magnetospheres  
 comets  
 ionopause
- cometary collisions**  
*(added June 1994)*  
 GS collisions  
 . **cometary collisions**  
 RT asteroid collisions  
 craters  
 Cretaceous-Tertiary boundary  
 Deep Impact Mission  
 hypervelocity impact  
 meteorite collisions  
 near Earth objects  
 shatter cones
- Shoemaker-Levy 9 comet
- cometary magnetospheres**  
*(added September 1988)*  
 RT cometary atmospheres  
 comets  
 $\infty$  magnetospheres
- comets**  
 DEF Luminous members of the solar system composed of a head, or coma, and often with a spectacular gaseous tail extending a great distance from the head.  
 GS celestial bodies  
 . **comets**  
 . . Arend-Roland comet  
 . . Austin comet  
 . . Brorsen-Metcalf comet  
 . . Encke comet  
 . . Giacobini-Zinner comet  
 . . Grigg-Skjellerup comet  
 . . Hale-Bopp comet  
 . . Halley's comet  
 . . Humason comet  
 . . IRAS-Araki-Alcock comet  
 . . Kohoutek comet  
 . . Morehouse comet  
 . . Mrkos comet  
 . . Okazaki-Levy-Rudenko comet  
 . . Schwassmann-Wachmann comet  
 . . Shoemaker-Levy 9 comet  
 . . Tempel 1 comet  
 . . Tempel 2 comet  
 . . West comet  
 . . Wild 2 comet  
 RT Bessel-Bredichin theory  
 $\infty$  coma  
 cometary atmospheres  
 cometary magnetospheres  
 Deep Impact Mission  
 hypothetical planets  
 Kuiper belt  
 meteorite parent bodies  
 meteoroid showers  
 meteoroids  
 near Earth objects  
 Oort cloud  
 solar system
- comfort**  
 RT acoustics  
 air conditioning  
 efficiency  
 environmental engineering  
 glare  
 human factors engineering  
 humidity  
 illuminating  
 $\infty$  performance  
 physiological effects  
 psychological effects  
 reward (psychology)  
 riding quality  
 seats  
 temperature  
 ventilation
- command and control**  
 UF *command-control*  
 RT  $\infty$  automation  
 autonomy  
 AWACS aircraft  
 $\infty$  commands  
 $\infty$  control  
 decision making  
 E-2 aircraft  
 E-3A aircraft  
 E-4A aircraft  
 ground support equipment  
 logistics  
 management  
 surveillance  
 targets
- command guidance**  
 DEF The guidance of a spacecraft or rocket by means of electronic signals sent to receiving devices in the vehicle. Used for command systems.  
 UF *command systems*



## command languages

GS guidance (motion)  
. **command guidance**  
RT ∞ commands  
ground support equipment  
injection guidance  
midcourse guidance  
rendezvous guidance  
rendezvous spacecraft  
spacecraft guidance  
terminal guidance

### command languages

DEF Vocabularies to interactively execute activities such as computer retrieval or input.

GS languages  
. **command languages**  
. . query languages  
RT human-computer interface  
information retrieval

### command modules

GS compartments  
. **command modules**  
modules  
. spacecraft modules  
. . **command modules**  
spacecraft components  
. spacecraft modules  
. . **command modules**  
RT Apollo spacecraft  
∞ commands  
Marquardt R4D engine  
service modules  
spacecraft docking modules  
spacecrew transfer

### command service modules

UF *CSM*  
GS modules  
. spacecraft modules  
. . **command service modules**  
spacecraft components  
. spacecraft modules  
. . **command service modules**  
RT Apollo project  
lunar orbits  
manned spacecraft  
Skylab 1  
Skylab 2  
Skylab 3  
Skylab 4  
spacecraft docking modules

### command systems

USE **command guidance**

### command-control

USE **command and control**

### Commando aircraft

USE **C-46 aircraft**

## ∞ commands

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT autonomy  
command and control  
command guidance  
command modules  
decisions

## commerce

GS **commerce**  
. electronic commerce  
commercial spacecraft  
consumption  
costs  
economic development  
finance  
gross national product  
industrial areas  
industries  
∞ investment  
liabilities  
losses  
manufacturing  
market research  
marketing  
PERT  
product development

project management  
risk  
supplying

## commerce lab

RT government/industry relations  
∞ microgravity applications  
mission planning  
space commercialization  
Space Shuttle payloads  
user requirements

## commercial aircraft

UF *commercial aviation*  
GS **commercial aircraft**  
. Boeing 707 aircraft  
. Boeing 720 aircraft  
. Boeing 727 aircraft  
. Boeing 733 aircraft  
. Boeing 737 aircraft  
. Boeing 747 aircraft  
. Boeing 757 aircraft  
. Boeing 767 aircraft  
. Boeing 777 aircraft  
. Comet 4 aircraft  
. CV-340 aircraft  
. CV-440 aircraft  
. CV-880 aircraft  
. CV-990 aircraft  
. DC 3 aircraft  
. DC 7 aircraft  
. DC 8 aircraft  
. DC 9 aircraft  
. DC 10 aircraft  
. DH 121 aircraft  
. DO-328 aircraft  
. Electra aircraft  
. European Airbus  
. . A-300 aircraft  
. . A-310 aircraft  
. . A-320 aircraft  
. . A-330 aircraft  
. . A-340 aircraft  
. . A-380 aircraft  
. F-28 transport aircraft  
. IL-62 aircraft  
. Jetstream aircraft  
. L-1011 aircraft  
. Lear jet aircraft  
. light transport aircraft  
. MD 11 aircraft  
. MD 80 aircraft  
. P-160 aircraft  
. SE-210 aircraft  
. supersonic commercial air transport  
. . Boeing 2707 aircraft  
. . TU-144 aircraft  
. Boeing 717 aircraft  
. TU-104 aircraft  
. TU-124 aircraft  
. TU-134 aircraft  
. TU-154 aircraft  
. TU-204 aircraft  
RT . VC-10 aircraft  
air transportation  
∞ aircraft  
airline operations  
cargo aircraft  
civil aviation  
commuter aircraft  
EH-101 helicopter  
general aviation aircraft  
ground effect machines  
jet aircraft  
passenger aircraft  
rotary wing aircraft  
supersonic transports  
transport aircraft  
utility aircraft  
V/STOL aircraft  
water takeoff and landing aircraft

### commercial aviation

USE **civil aviation**  
**commercial aircraft**

## commercial energy

RT allocations  
distributing  
domestic energy

economic factors  
∞ energy  
energy consumption  
energy conversion  
industrial energy  
transportation energy

## commercial off-the-shelf products

(added March 2001)

DEF Readily-available, commercially-developed products; often referring to commercial products that can be used as an alternative to in-house or customized product development.

UF *COTS products*

GS products

. **commercial off-the-shelf products**

RT commercialization  
cost effectiveness  
government procurement  
procurement management  
product development

## commercial spacecraft

DEF Commercial satellites and other spacecraft operated by the private sector.

GS **commercial spacecraft**

. RCA Satcom satellites

RT aerospace industry  
aerospace vehicles  
commerce  
communication satellites  
industries  
space commercialization  
space industrialization  
space manufacturing  
space processing  
VentureStar launch vehicle

## commercialization

(added March 1997)

GS **commercialization**

. space commercialization

RT commercial off-the-shelf products  
government/industry relations  
marketing  
product development  
technology transfer

## comminution

UF *attrition (materials)*

GS **comminution**

. crushing  
. grinding (comminution)  
. shredding

RT atomizing  
beneficiation  
chipping  
colloiding  
crushers  
cutting  
disintegration  
flaking  
fragmentation  
gas atomization  
grinding mills  
metal powder  
∞ milling  
particle production  
powder metallurgy  
∞ reduction

## Committee on Space Research

UF *COSPAR (committee)*

RT ∞ aerospace sciences  
conferences  
European space programs  
international cooperation  
NASA programs  
programs

## commodities

RT government procurement  
manufacturing  
market research  
procurement management

- products
- Common Business Oriented Language*  
USE **Cobol**
- commonality**  
DEF The factors which are common in equipment or systems.  
GS standardization  
  . **commonality**  
RT aircraft equipment  
  cost reduction  
  efficiency  
  equipment specifications  
  ground support systems  
  interoperability  
  spacecraft components  
  specifications
- Commonwealth of Independent States**  
(added September 1993)  
UF *CIS*  
RT Asia  
  Europe  
  nations  
  Russian Space Program
- communicating**  
GS **communicating**  
  . aircraft communication  
  . electrocutaneous communication  
  . ground-air-ground communication  
  . information dissemination  
  . . messages  
  . . selective dissemination of information  
  . interstellar communication  
  . lip reading  
  . point to point communication  
  . . NASCOM network  
  . underground communication  
  . verbal communication  
  . . conversation  
RT color television  
  computer conferencing  
  crosstalk  
  education  
  frequency assignment  
  information  
  information flow  
  information management  
  message processing  
  Morse code  
  stereotelevision  
  systems engineering  
  TDR satellites  
  technology transfer  
  telecommunication
- communication**  
GS telecommunication  
  . **communication**  
  . . facsimile communication  
  . . . automatic picture transmission  
  . . line of sight communication  
  . . optical communication  
  . . . free-space optical communication  
  . . ship to shore communication  
  . . underwater communication  
  . . voice communication  
  . . . telephony  
  . . quantum communication  
RT computer conferencing  
  information  
  information flow  
  information management  
  Marisat satellites  
  message processing  
  spread spectrum transmission  
  technology transfer
- communication cables**  
GS transmission lines  
  . **communication cables**  
  . . coaxial cables  
RT cable television  
∞ cables  
  electric wire  
  optical fibers  
  submarine cables
- waveguides
- communication equipment**  
GS **communication equipment**  
  . Advanced Vidicon Camera System (AVCS)  
  . closed circuit television  
  . duplexers  
  . interphones  
  . PLAT system  
  . radio receivers  
  . . superheterodyne receivers  
  . . transmitter receivers  
  . . whistler recorders  
  . spacecraft television  
  . . digital spacecraft television  
  . . Ranger block 3 television system  
  . . satellite television  
  . stereotelevision  
RT antenna components  
  biotelemetry  
  color television  
  Earth terminals  
  educational television  
∞ equipment  
  furlable antennas  
  high definition television  
  inertialless steerable antennas  
  information adaptive system  
  logarithmic receivers  
  matched filters  
  orbiting dipoles  
  P.A.C.M. telemetry  
  pulse frequency modulation  
  pulse frequency modulation telemetry  
  radio communication  
  radio equipment  
  radio relay systems  
  radio telegraphy  
  radio telemetry  
  spherical antennas  
  telemetry  
  telephony  
  television systems  
  unified S band
- communication networks**  
DEF Organization of facilities for the rapid reception of, transmission of, and/or relaying of electrical impulses for reproduction as printed messages, pictures, or other data.  
GS networks  
  . **communication networks**  
  . . Aloha system  
  . . Deep Space Network  
  . . internets  
  . . . ARPA computer network  
  . . . World Wide Web  
  . . Iridium network  
  . . local area networks  
  . . NASCOM network  
  . . VSAT (network)  
  . . wide area networks  
RT access control  
  asynchronous transfer mode  
  broadcasting  
  carrier sense multiple access  
  data links  
  defense communications system (DCS)  
  demand assignment multiple access  
  electronic bulletin boards  
  electronic mail  
  frequency division multiplexing  
  network control  
  packet switching  
  packets (communication)  
  protocol (computers)  
  pulse communication  
  radio communication  
  satellite constellations  
  satellite networks  
  telecommunication  
  video conferencing
- communication satellites**  
DEF Satellites designed to reflect or relay electromagnetic signals used for communication.  
UF *Iridium satellites*
- GS artificial satellites  
  . **communication satellites**  
  . . ACTS  
  . . aeronautical satellites  
  . . . Aerosat satellites  
  . . Arcomsat  
  . . Communications Technology Satellite  
  . . . ComStar C  
  . . . NATO 3B satellite  
  . . ComStar satellites  
  . . direct broadcast satellites  
  . . European Communications Satellite  
  . . Intelsat satellites  
  . . low frequency transionospheric satellites  
  . . L-Sat  
  . . Marecs maritime satellites  
  . . Marots (ESA)  
  . . Molniya satellites  
  . . MSAT  
  . . Palapa satellites  
  . . . Palapa 2 satellite  
  . . Raduga satellite  
  . . RCA Satcom satellites  
  . . Relay satellites  
  . . . Relay 1 satellite  
  . . . Relay 2 satellite  
  . . Symphonie satellites  
  . . SYNCOM satellites  
  . . . Early Bird satellites  
  . . . SYNCOM 1 satellite  
  . . . SYNCOM 2 satellite  
  . . . SYNCOM 3 satellite  
  . . . SYNCOM 4 satellite  
  . . TDR satellites  
  . . Westar satellites  
RT Advent Project  
  ATS  
  carrier to noise ratios  
  commercial spacecraft  
  Comsat program  
  Defense Communications Satellite System  
  demand assignment multiple access  
  domestic satellite communications systems  
  downlinking  
  Earth terminal measurement system  
  Echo project  
  electronic mail  
  Fleet Satellite Communication System  
  geophysical satellites  
  ground-air-ground communication  
  HET experiment  
  Indian space program  
  INMARSAT satellites  
  Iridium network  
  land mobile satellite service  
  mobile communication systems  
  network control  
  orbit spectrum utilization  
  passive satellites  
  radio relay systems  
  satellite communication  
  satellite constellations  
  satellite networks  
  Skynet satellites  
  space commercialization  
  space communication  
  Synchronous Communications Satellite Proj  
  Synchronous Meteorological Satellite  
  synchronous platforms  
  synchronous satellites  
  telecommunication  
  teleconferencing  
  Telstar project  
  unmanned spacecraft  
  uplinking  
  wireless communication
- communication systems*  
USE **telecommunication**
- communication theory**  
UF *statistical communication theory*  
RT cross coupling

cybernetics  
 data transmission  
 high level languages  
 information theory  
 intelligibility  
 languages  
 lattices (mathematics)  
 messages  
 network synthesis  
 quantum communication  
 random noise  
 random processes  
 redundancy  
 semantics  
 sentences  
 signal to noise ratios  
 switching theory  
 ∞ theories

**Communications Technology Satellite**

UF *Hermes satellite*  
 GS artificial satellites  
 . communication satellites  
 . . **Communications Technology Satellite**  
 . . . ComStar C  
 . . . NATO 3B satellite  
 RT Canada  
 Canadian space program  
 international cooperation  
 NASA programs  
 synchronous satellites  
 technology assessment  
 technology utilization

**communities**

GS **communities**  
 . inhabitants  
 . . mountain inhabitants  
 . space colonies  
 RT cities  
 demography  
 ethnic factors  
 integrated energy systems  
 megalopolises  
 minorities  
 Modular Integrated Utility System  
 nations  
 police  
 politics  
 regimes  
 sociology  
 Starsite program  
 United Nations  
 urban development  
 urban planning  
 urban research

**commutation**

DEF Sequential sampling, on a repetitive timesharing basis, of multiple data sources for transmitting or recording, or both, on a single channel.  
 RT commutators  
 interpolation  
 switching theory

**commutators**

DEF Devices used to accomplish time division multiplexing by repetitive sequential switching.  
 GS **commutators**  
 . decommutators  
 RT armatures  
 commutation  
 distributors  
 electric contacts  
 electric motors  
 ∞ rotating electrical machines  
 rotating generators

**commuter aircraft**

(added October 1988)  
 GS passenger aircraft  
 . **commuter aircraft**  
 . . ATR-72 aircraft  
 RT air transportation  
 ∞ aircraft  
 commercial aircraft

general aviation aircraft

*compact disk read-only memory devices*  
 USE **optical disks**

**compact galaxies**

(added November 1988)  
 GS celestial bodies  
 . galaxies  
 . . **compact galaxies**  
 RT galactic structure

**compacting**

RT agglomeration  
 cold pressing  
 densification  
 hot isostatic pressing  
 hot pressing  
 powder metallurgy  
 presses  
 ∞ pressing  
 pressing (forming)  
 vibration

*compactness*

USE **void ratio**

**companding**

DEF A process in which compression is followed by expansion, as in noise reduction systems.  
 RT frequency modulation modulation  
 radio transmission  
 signal processing  
 signal to noise ratios

**companion stars**

GS celestial bodies  
 . stars  
 . . double stars  
 . . . binary stars  
 . . . . **companion stars**  
 . . . . . Nemesis (star)  
 RT brown dwarf stars  
 parallax  
 stellar motions  
 triple stars  
 variable stars  
 x ray binaries

**comparator circuits**

GS circuits  
 . **comparator circuits**  
 RT clipper circuits  
 delay circuits  
 discrimination  
 time discrimination

**comparators**

DEF In computer operations, devices or circuits for comparing information from two sources.  
 GS measuring instruments  
 . **comparators**  
 RT anticoincidence detectors  
 discriminators  
 error signals  
 harmonic generators  
 monochromators  
 reflectometers

**comparison**

RT analogies  
 cost analysis  
 Earth analogs  
 economic analysis  
 estimates  
 evaluation  
 examination  
 intercalibration  
 matching  
 pattern registration  
 ranking

*compartmentation*

USE **compartments**

**compartments**

UF *compartmentation*  
 GS **compartments**

. air locks  
 . . airlock modules  
 . aircraft compartments  
 . command modules  
 . pressurized cabins  
 . spacecraft cabins  
 . test chambers  
 . . anechoic chambers  
 . . pressure chambers  
 . . . hyperbaric chambers  
 . . . vacuum chambers  
 . . reverberation chambers  
 RT bays (structural units)  
 ∞ cells  
 crew experiment stations  
 crew observation stations  
 crew workstations  
 enclosures  
 modules  
 rooms  
 space station modules  
 spacecraft modules

**COMPASS (programming language)**

GS languages  
 . programming languages  
 . . Assembly language  
 . . . **COMPASS (programming language)**  
 RT compilers  
 computer programming

**compasses**

DEF Instruments for indicating a horizontal reference direction, specifically, magnetic compasses.  
 GS measuring instruments  
 . indicating instruments  
 . . **compasses**  
 . . . gyrocompasses  
 . . . magnetic compasses  
 . . . solar compasses  
 navigation aids  
 . navigation instruments  
 . . **compasses**  
 . . . gyrocompasses  
 . . . magnetic compasses  
 . . . solar compasses  
 RT aircraft instruments  
 beacons  
 buoys  
 flight instruments  
 radar beacons  
 radio direction finders  
 transits

**compatibility**

DEF A characteristic ascribed to a major subsystem that indicates it functions well in the overall system. Also applied to the overall system with reference to how well its various subsystems work together, as in 'the vehicle has good compatibility.' Also applied to materials which can be used in conjunction with other materials and not react with each other under normal operating conditions.  
 GS **compatibility**  
 . biocompatibility  
 . chemical compatibility  
 . electromagnetic compatibility  
 . systems compatibility  
 RT acceptability  
 affinity  
 conventions  
 permissivity  
 stability  
 suitability  
 versatility

∞ **compensation**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT allowances  
 errors  
 image motion compensation  
 instrument compensation  
 temperature compensation

transient response

**compensators**

- RT balance
- bias
- compulsators
- error signals
- feedback
- loop transfer recovery
- video equipment

**compensatory tracking**

- GS tracking (position)
- . **compensatory tracking**
- RT infrared tracking
- optical tracking
- radar tracking

**competition**

- RT athletes
- human performance
- human reactions
- physical fitness

*compilation (computers)*

USE **compilers**

*compiler programs*

USE **compilers**

**compilers**

- SN (PROGRAM-MAKING ROUTINES FOR DIGITAL COMPUTERS)
- UF *compilation (computers)*
- compiler programs*
- GS computer programs
- . **compilers**
- RT assembler routines
- autocoders
- C (programming language)
- collating
- COMPASS (programming language)
- computer program integrity
- computer systems programs
- data conversion routines
- disk operating system (DOS)
- FORTTRAN
- operating systems (computers)
- parsing algorithms
- Pascal (programming language)
- PL/1
- programmed instruction
- subroutines

∞ **complement**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF An angle equal to 90 deg. minus a given angle. The true complement of any quantity in positional notation, i.e. the quantity which, when added to the first quantity, gives the least quantity containing one more place. The base-minus-one complement of any quantity in positional notation; i.e., the quantity which when added to the first quantity containing the same number of places.

- RT complement (biology)
- complements (mathematics)
- personnel

**complement (biology)**

- RT ∞ biology
- ∞ complement
- hemolysis

**complementary DNA**

(added August 2004)

- GS acids
- . nucleic acids
- . . deoxyribonucleic acid
- . . . **complementary DNA**
- biopolymers
- . nucleic acids
- . . deoxyribonucleic acid
- . . . **complementary DNA**
- organic compounds
- . nucleic acids
- . . deoxyribonucleic acid

. . . **complementary DNA**

*complementary metal oxide semiconductors*

USE **CMOS**

**complements (mathematics)**

- RT angles (geometry)
- ∞ complement
- ∞ logic

**completeness**

- RT achievement
- computer program integrity
- integrity

**complex compounds**

DEF Chemical compounds in which part of the molecular bonding is of the coordinate type.

- RT ∞ chemical compounds
- molecular structure
- transition metals

**complex numbers**

- RT geometry
- integers
- ∞ numbers
- real numbers

**complex systems**

- RT parameter identification
- reliability engineering
- system identification
- ∞ systems
- systems analysis

**complex variables**

- GS analysis (mathematics)
- . **complex variables**
- . . Airy function
- . . analytic functions
- . . . entire functions
- . . Bessel functions
- . . . Hankel functions
- . . Cauchy integral formula
- . . conformal mapping
- . . conjugates
- . . conjugate points
- . . exponential functions
- . . . logarithms
- . . gamma function
- . . harmonic functions
- . . hyperbolic functions
- . . hypergeometric functions
- . . Laguerre functions
- . . Legendre functions
- . . Liouville theorem
- . . Mathieu function
- . . meromorphic functions
- . . . elliptic functions
- . . . rational functions
- . . nonholonomic equations
- . . orthogonal functions
- . . . Walsh function
- . . Schwarz-Christoffel transformation
- . . singularity (mathematics)
- . . . naked singularities
- . . spherical harmonics

- RT aperiodic functions
- complexity
- dependent variables
- Euler-Cauchy equations
- functional analysis
- Joukowski transformation
- maximum principle
- real variables
- Schauder fixpoint theorem
- stability derivatives
- Theodorsen transformation
- uniqueness theorem
- ∞ variable

**complexity**

- UF *complication*
- GS **complexity**
- . task complexity
- RT complex variables
- feedback
- ∞ performance

statistical distributions

*compliance (elasticity)*

USE **modulus of elasticity**

*complication*

USE **complexity**

**component reliability**

- GS reliability
- . **component reliability**
- RT aircraft reliability
- circuit reliability
- cumulative damage
- process control (industry)
- quality control
- retirement for cause
- spacecraft reliability
- structural reliability
- systems health monitoring

∞ **components**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF An article which is a self-contained element of a complete operating unit and performs a function necessary to the operation of that unit. Used for parts.

UF *parts*

- RT accessories
- antenna components
- assemblies
- computer components
- content
- engine parts
- fractions
- ingredients
- missile components
- modules
- redundant components
- segments
- spacecraft components
- spare parts
- structural members
- subassemblies

**composite functions**

- GS analysis (mathematics)
- . real variables
- . . **composite functions**
- functions (mathematics)
- . **composite functions**

**composite materials**

DEF Structural materials of metals, ceramics, or plastics with built-in strengthening agents which may be in the form of filaments, foils, powders, or flakes of a different compatible material. Used for composites and pyrographalloy.

UF *composites*

*pyrographalloy*

GS **composite materials**

- . Boral
- . boron reinforced materials
- . . aluminum boron composites
- . . boron-epoxy composites
- . carbon-carbon composites
- . ceramic matrix composites
- . . carbon-silicon carbide composites
- . cermets
- . composite propellants
- . fiber composites
- . . aramid fiber composites
- . . braided composites
- . . carbon fiber reinforced plastics
- . . . carbon-phenolic composites
- . . glass fiber reinforced plastics
- . . woven composites
- . functionally gradient materials
- . glassy carbon
- . hybrid composites
- . metal matrix composites
- . . aluminum boron composites
- . . aluminum graphite composites
- . . Borsic (tradename)
- . . eutectic composites
- . particulate reinforced composites
- . plywood
- . polymer matrix composites

## composite propellants

- . . epoxy matrix composites
- . . . boron-epoxy composites
- . . . graphite-epoxy composites
- . . graphite-polyimide composites
- . . reinforced plastics
- . . . carbon fiber reinforced plastics
- . . . carbon-phenolic composites
- . . . glass fiber reinforced plastics
- . . . micarta
- . resin matrix composites
- . . boron-epoxy composites
- . . carbon-phenolic composites
- . . graphite-epoxy composites
- . superhybrid materials
- . . graphite-epoxy composites
- . nanocomposites
- . three dimensional composites
- . whisker composites
- RT aircraft construction materials
- airframe materials
- aramid fibers
- bimetals
- boron fibers
- carbon fibers
- chemical vapor infiltration
- cladding
- coatings
- ∞ construction materials
- E glass
- fiber orientation
- fiber pullout
- fiber pushout
- fiber volume fraction
- fiber-matrix interfaces
- fibers
- insulation
- interlaminar stress
- laminates
- lay-up
- low density research
- ∞ materials
- ∞ matrices
- matrix materials
- metals
- micromechanics
- mixtures
- modular ratios
- monotectic alloys
- multilayer insulation
- ply orientation
- powder metallurgy
- preforms
- prepregs
- reinforcement (structures)
- reinforcing fibers
- reinforcing materials
- resin film infusion
- resin transfer molding
- rigid structures
- ∞ rovings
- S glass
- sandwich structures
- sheet molding compounds
- smart materials
- solid suspensions
- spiral wrapping
- stacking sequence (composite materials)
- thermosetting resins

### composite propellants

DEF Solid rocket propellants consisting of a fuel and an oxidizer neither of which would burn without the presence of the other.

- GS composite materials
- . **composite propellants**
- propellants
- . solid propellants
- . . **composite propellants**
- RT case bonded propellants
- double base propellants
- double base rocket propellants
- explosives
- fuel production
- plastic propellants
- plastisols
- polysulfides
- polyurethane resins
- propellant additives

- propellant binders
- solid rocket propellants

### composite structures

- GS **composite structures**
- . laminates
- . . Boral
- . . plywood
- RT boron-epoxy composites
- ceramic matrix composites
- clamped structures
- functionally gradient materials
- glass fiber reinforced plastics
- honeycomb cores
- honeycomb structures
- hybrid structures
- lay-up
- pultrusion
- resin film infusion
- sheet molding compounds
- smart structures
- steel structures
- ∞ structures

### composite wrapping

- RT ceramic fibers
- fiber composites
- filament winding
- isotensoid structures
- spiral wrapping
- ∞ wrap

### composites

USE **composite materials**

### ∞ composition

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT composition (property)
- content
- formulations
- ingredients
- stoichiometry

### composition (property)

- GS **composition (property)**
- . atmospheric composition
- . . atmospheric moisture
- . . ionospheric composition
- . body composition (biology)
- . chemical composition
- . . carbon dioxide concentration
- . . stellar composition
- . . concentration (composition)
- . . atom concentration
- . . carbon dioxide concentration
- . . fiber volume fraction
- . . low concentrations
- . . mascons
- . . meteoroid concentration
- . . moisture content
- . . . atmospheric moisture
- . gas composition
- . . carbon dioxide concentration
- . isotope ratios
- . lunar composition
- . meteoritic composition
- . planetary composition
- . plasma composition

- RT ∞ composition
- gradients
- Henry law
- lumping
- mixtures
- Raoult law
- solutions
- stoichiometry

### composting

- GS disposal
- . waste disposal
- . . **composting**
- management
- . waste management
- . . waste disposal
- . . . **composting**
- RT garbage
- metabolic wastes
- shredding
- solid wastes

- waste treatment
- waste utilization

### compound A

- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . **compound A**
- . . halides
- . . fluorides
- . . . **compound A**
- RT ∞ chemical compounds

### compound helicopters

- GS V/STOL aircraft
- . rotary wing aircraft
- . . helicopters
- . . . **compound helicopters**
- . . . . S-67 helicopter
- RT aeronautical engineering
- air transportation
- ∞ aircraft
- aircraft configurations
- aircraft design
- helicopter design
- short takeoff aircraft
- vertical takeoff aircraft

### compounding

- UF *milling (mixing)*
- GS mixing
- . **compounding**
- RT colloidizing
- dissolving
- grinding (comminution)
- homogenizing
- ∞ milling

### ∞ compounds

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
- potting compounds

### compressed air

- GS gases
- . gas mixtures
- . . air
- . . . **compressed air**
- mixtures
- . solutions
- . . gas mixtures
- . . . air
- . . . . **compressed air**
- RT compressors
- drills
- energy storage
- man operated propulsion systems
- oxygen supply equipment
- pneumatic equipment
- ∞ pumping

### compressed gas

DEF Any gaseous materials or mixtures having a container pressure exceeding 40 psi at 70 degrees F, or 104 psi at 130 degrees F. Compressed gases are further defined as flammable or nonflammable.

- GS gases
- . **compressed gas**
- . . high pressure oxygen
- RT compressors
- gas pressure
- pneumatic control

### compressed video

USE **video compression**

### compressibility

DEF The property of a substance, as air, by virtue of which its density increases with increase in pressure.

- GS mechanical properties
- . **compressibility**
- RT bulk modulus
- compressible flow
- compressive strength
- density (mass/volume)
- equations of state
- Gruneisen constant

hydroelasticity  
 incompressibility  
 metal powder  
 porosity  
 powder (particles)

**compressibility effects**  
 RT buffeting  
 compressible flow  
 ∞ effects  
 flutter  
 heat transfer  
 oscillating flow  
 pressure effects  
 relaxation (physiology)  
 secondary flow  
 supersonic flow  
 transonic flow

**compressible boundary layer**  
 GS boundary layers  
 . **compressible boundary layer**  
 RT laminar boundary layer  
 three dimensional boundary layer  
 turbulent boundary layer

**compressible flow**  
 DEF In aerodynamics, flow at speeds sufficiently high that density changes in the fluid cannot be neglected.  
 GS fluid flow  
 . **compressible flow**  
 . . Ringleb flow  
 . . transonic flow  
 RT aerodynamics  
 air flow  
 Cartan space  
 compressibility  
 compressibility effects  
 Crocco method  
 gas flow  
 Hugoniot equation of state  
 hypersonic flow  
 incompressible flow  
 magnetohydrodynamic flow  
 Newton pressure law  
 stagnation flow  
 stagnation pressure  
 stagnation temperature  
 subsonic flow  
 supersonic flow

**compressible fluids**  
 RT aerodynamic heating  
 Crocco method  
 fluid power  
 ∞ fluids  
 hydroelasticity  
 ideal fluids  
 incompressible fluids  
 Maxwell fluids  
 method of characteristics  
 P waves  
 superfluidity

**compressing**  
 UF *recompression*  
*squeezing*  
 GS **compressing**  
 . plasma compression  
 . speech baseband compression  
 RT adiabatic conditions  
 anvils  
 axial compression loads  
 blowing  
 compressors  
 concentrating  
 densification  
 internal compression inlets  
 magnetic compression  
 mechanical properties  
 metal powder  
 piston theory  
 ∞ pressing  
 pressure  
 pressure reduction  
 pulse compression  
 ∞ pumping  
 rarefaction  
 squeeze casting

superchargers

**compression loads**  
 GS loads (forces)  
 . **compression loads**  
 . . axial compression loads  
 . . impact loads  
 RT aerodynamic loads  
 axial loads  
 buckling  
 compressive strength  
 contact loads  
 dynamic loads  
 edge loading  
 kink bands  
 kinking  
 mechanical properties  
 shock loads  
 static loads  
 structural design criteria  
 thrust loads

**compression ratio**  
 DEF In internal combustion engines, the ratio between the volume displaced by the piston plus the clearance space, to the volume of the clearance space.  
 GS ratios  
 . **compression ratio**  
 RT efficiency  
 fuel-air ratio

*compression testers*  
 USE **compression tests**

**compression tests**  
 UF *compression testers*  
*meteorite compression tests*  
 RT creep tests  
 destructive tests  
 hardness tests  
 impact tests  
 load tests  
 ∞ materials tests  
 static tests  
 ∞ tests

**compression waves**  
 DEF In acoustics, waves in an elastic medium which cause an element of the medium to change its volume without undergoing rotation. Mathematically, a compression wave is one whose velocity wave has zero curl.  
 GS elastic waves  
 . **compression waves**  
 RT P waves  
 wave rotors

**compressive strength**  
 DEF The maximum load sustained by a standard specimen of a material when subjected to a crushing force.  
 GS mechanical properties  
 . **compressive strength**  
 RT compressibility  
 compression loads  
 ductility  
 elastic properties  
 fiber strength  
 high strength  
 load carrying capacity  
 Poisson ratio  
 resilience  
 shear strength  
 ∞ strength  
 toughness

**compressor blades**  
 DEF Blades which are either rotor blades or stator blades in axial-flow compressors; sometimes used restrictively (and ambiguously) for compressor rotor blades.  
 GS turbomachine blades  
 . **compressor blades**  
 RT ∞ blades  
 centrifugal compressors  
 fan blades  
 rotating stalls  
 rotor blades (turbomachinery)  
 stator blades

turbine blades  
 turbocompressors  
 vanes

**compressor efficiency**  
 GS efficiency  
 . **compressor efficiency**  
 RT power efficiency  
 thermodynamic efficiency

**compressor rotors**  
 GS rotating bodies  
 . rotors  
 . . **compressor rotors**  
 RT centrifugal compressors  
 compressors  
 ∞ fans  
 impellers  
 rotor blades (turbomachinery)  
 turbine wheels  
 turbocompressors

**compressors**  
 SN (EXCLUDES DATA COMPRESSORS)  
 DEF Machines for compressing air or other fluids.  
 GS **compressors**  
 . centrifugal compressors  
 . superchargers  
 . supersonic compressors  
 . transonic compressors  
 . turbocompressors  
 RT air conditioning equipment  
 blowers  
 compressed air  
 compressed gas  
 compressing  
 compressor rotors  
 condensers (liquefiers)  
 coolers  
 ∞ fans  
 refrigerating machinery  
 stators  
 turbomachinery  
 vacuum pumps  
 vaneless diffusers

**Compton effect**  
 DEF The decrease in frequency and increase in wavelength of x rays or gamma rays when scattered by free electrons.  
 GS scattering  
 . **Compton effect**  
 RT coherent scattering  
 ∞ effects  
 inelastic scattering  
 nuclear reactions  
 photoelectricity  
 Sunyaev-Zeldovich effect

*Compton Gamma Ray Observatory*  
 USE **Gamma Ray Observatory**

**compulsators**  
 DEF Compensated pulsed alternators, i.e., single phased alternators designed for pulsed power duty with air gap armature windings and air gap compensating windings.  
 RT AC generators  
 compensators  
 electric power supplies  
 pulse generators

**computation**  
 UF *calculation*  
 GS **computation**  
 . computational geometry  
 . orbit calculation  
 . . minimum variance orbit  
 determination  
 . . orbital position estimation  
 . quantum computation  
 RT addition  
 ∞ applications of mathematics  
 arithmetic  
 calculators  
 computational astrophysics  
 computational electromagnetics  
 computational fluid dynamics  
 computers

## computational aeroacoustics

- data processing
- data reduction
- dividing (mathematics)
- flux vector splitting
- ∞ formulas
- ill-conditioned problems (mathematics)
- interpolation
- linear prediction
- multiplication
- subtraction
- sums
- systolic arrays

### computational aeroacoustics

(added November 2008)

DEF Computational methods used for the numerical simulation of acoustic fields generated by and interacting with fluid flows.

- GS acoustics
  - . aeroacoustics
  - . . **computational aeroacoustics**
- analysis (mathematics)
- . numerical analysis
- . . **computational aeroacoustics**
- RT aerodynamic noise
- boundary conditions
- computational fluid dynamics
- Flowcs Williams-Hawkings equation
- finite difference theory
- noise prediction (aircraft)
- sound waves
- wave propagation

*computational aerodynamics*

(added April 1997)

USE **computational fluid dynamics**

### computational astrophysics

- GS analysis (mathematics)
- . numerical analysis
- . . **computational astrophysics**
- astrophysics
- . **computational astrophysics**
- RT computation
- computerized simulation
- laboratory astrophysics
- mathematical models
- ∞ science

### computational chemistry

DEF A complementary method for determining properties of gases, solids, and their interactions from first principle calculations. It extends testing capabilities to realms that are too dangerous or too costly to obtain experimentally.

- GS analysis (mathematics)
- . numerical analysis
- . . **computational chemistry**
- RT ∞ chemistry
- computer techniques
- computerized simulation
- configuration interaction
- physical chemistry
- self consistent fields
- ∞ tests

### computational electromagnetics

(added March 1995)

- GS analysis (mathematics)
- . numerical analysis
- . . **computational electromagnetics**
- RT computation
- computational fluid dynamics
- electromagnetism
- finite difference time domain method
- meshfree methods
- parallel processing (computers)
- perfectly matched layers
- radar cross sections

### computational fluid dynamics

DEF The field of study concerned with the application of high-speed digital computers to solve the complete nonlinear partial differential equations governing viscous fluid flows.

UF *computational aerodynamics*

- GS analysis (mathematics)
- . numerical analysis

- . . **computational fluid dynamics**
- mechanics (physics)
- . fluid mechanics
- . . fluid dynamics
- . . . **computational fluid dynamics**
- RT Baldwin-Lomax turbulence model
- BGK model
- Burnett equations
- computation
- computational aeroacoustics
- computational electromagnetics
- computational mechanics
- convection-diffusion equation
- direct numerical simulation
- ∞ dynamics
- equations of motion
- finite element method
- flow deflection
- flow equations
- flux difference splitting
- flux vector splitting
- Godunov method
- grid generation (mathematics)
- hydrodynamic coefficients
- interactional aerodynamics
- k-epsilon turbulence model
- k-omega turbulence model
- large eddy simulation
- meshfree methods
- multiblock grids
- multigrid methods
- Navier-Stokes equation
- numerical flow visualization
- panel method (fluid dynamics)
- relaxation method (mathematics)
- Reynolds averaging
- space-time CE/SE method
- spectral methods
- structured grids (mathematics)
- turbulence models
- TVD schemes
- unstructured grids (mathematics)
- upwind schemes (mathematics)
- vortex in cell technique
- vortex lattice method

### computational geometry

(added August 1988)

- GS computation
- . **computational geometry**
- geometry
- . **computational geometry**
- RT computer aided design
- Voronoi diagrams

### computational grids

- UF *grids (mathematics)*
- mesh (mathematics)*
- GS coordinates
- . **computational grids**
- . . structured grids (mathematics)
- . . . multiblock grids
- . . unstructured grids (mathematics)
- RT grid generation (mathematics)
- grid refinement (mathematics)
- ∞ grids
- mathematical models
- multigrid methods
- numerical analysis
- perfectly matched layers
- problem solving
- three dimensional models

*computational grids (computer networks)*

(added December 2003)

USE **grid computing (computer networks)**

### computational mechanics

(added June 2008)

DEF The discipline concerned with the development and application of numerical and scientific computing methods to study phenomena governed by the principles of mechanics.

- GS analysis (mathematics)
- . numerical analysis
- . . approximation
- . . . **computational mechanics**
- mechanics (physics)
- . **computational mechanics**

- RT boundary element method
- computational fluid dynamics
- computerized simulation
- continuum mechanics
- finite element method
- fracture mechanics
- mathematical models
- meshfree methods
- solid mechanics
- structural analysis

### computer aided design

DEF The use of the computer in design work. Used for CAD (design), computer aided engineering, and computerized design.

- UF *CAD (design)*
- computer aided engineering*
- computerized design*
- GS computer techniques
- . **computer aided design**
- . . IPAD
- RT aircraft design
- amplifier design
- computational geometry
- computer graphics
- computerized simulation
- ∞ design
- design optimization
- drafting machines
- engine design
- helicopter design
- human-computer interface
- lens design
- lofting
- logic design
- missile design
- multidisciplinary design optimization
- rapid prototyping
- reactor design
- robotics
- satellite design
- spacecraft design
- structural design
- structured programming
- three dimensional models

*computer aided engineering*

USE **computer aided design**

### computer aided manufacturing

DEF Interactive computing in support of manufacturing. Used for CAM (manufacturing).

- UF *CAM (manufacturing)*
- GS computer techniques
- . **computer aided manufacturing**
- manufacturing
- . **computer aided manufacturing**
- RT computer graphics
- computerized simulation
- group technology (manufacturing)
- rapid prototyping
- robotics

### computer aided mapping

DEF Creating data bases of topographic and man-made features for the production of traditional maps and digital maps. Resultant digital maps have great flexibility and can be easily updated. The user can select the appropriate scale, view selected features, and view any desired area.

- GS computer techniques
- . **computer aided mapping**
- mapping
- . **computer aided mapping**
- RT computer graphics
- computerized simulation
- maps
- robotics

### computer aided tomography

- UF *CAT scanner*
- GS computer techniques
- . **computer aided tomography**
- imagery
- . radiography
- . . tomography
- . . . **computer aided tomography**
- RT computer graphics

image processing

remote consoles

terrorism

**computer animation**

- GS arts
  - . graphic arts
  - . . animation
  - . . . **computer animation**
- computer graphics
  - . **computer animation**
- computer techniques
  - . **computer animation**
- RT computerized simulation
  - motion pictures

*computer architecture*

USE **architecture (computers)**

**computer assisted instruction**

DEF The use of a computer to present instructional material and to accept and evaluate student responses.

- UF CAI
- GS computer techniques
  - . **computer assisted instruction**
- education
  - . programmed instruction
  - . . **computer assisted instruction**
- RT language programming
  - symbolic programming

*computer bulletin boards*

USE **electronic bulletin boards**

*computer codes*

USE **computer programs**

**computer compatible tapes**

- DEF Machine readable tapes.
- GS computer components
  - . computer storage devices
  - . . **computer compatible tapes**
  - magnetic tapes
    - . **computer compatible tapes**
- RT computers
  - data processing equipment
  - digital computers
- ∞ tapes

**computer components**

- GS **computer components**
  - . adding circuits
  - . central processing units
    - . . arithmetic and logic units
    - . . RISC processors
    - . chips (memory devices)
  - . computer storage devices
    - . . bubble memory devices
    - . . buffer storage
    - . . computer compatible tapes
    - . . cryogenic computer storage
    - . . delay lines (computer storage)
    - . . magnetic disks
    - . . magnetic drums
    - . . optical disks
    - . . random access memory
      - . . . carbon nanotube based memory
      - . . . core storage
      - . . . read-only memory devices
      - . . . CD-ROM
    - . . registers (computers)
      - . . . accumulators (computers)
    - . microprocessors
      - . . Intel 8080 microprocessor
    - . peripheral equipment (computers)
    - . printers (data processing)
    - . . remote consoles
    - . shift registers
  - RT architecture (computers)
    - binary to decimal converters
  - ∞ components
    - computers
    - consoles
    - control units (computers)
    - counters
    - decimal to binary converters
    - digital electronics
    - firmware
    - logical elements

**computer conferencing**

*(added September 1993)*

DEF A form of teleconferencing that allows one or more users to exchange messages on a computer network.

- GS telecommunication
  - . teleconferencing
  - . . **computer conferencing**
- RT communicating
  - communication
  - electronic bulletin boards
  - electronic mail
  - electronic publishing
  - World Wide Web

**computer design**

- SN (DESIGN OF COMPUTERS--EXCLUDES COMPUTERIZED DESIGN AND SYSTEMS ENGINEERING)
- RT architecture (computers)
  - chips (electronics)
  - computers
    - ∞ design
      - fluid logic
      - hardware description languages
      - logic design
      - memory (computers)
      - microprocessors
      - MIMD (computers)
      - optical computers
      - product development
      - read-only memory devices
      - SIMD (computers)

**computer graphics**

DEF The technique of combining computer calculations with various display devices, printers, plotters, etc. to render information in graphical or pictorial format. Used for interactive graphics.

- UF *interactive graphics*
- GS **computer graphics**
  - . computer animation
- RT computer aided design
  - computer aided manufacturing
  - computer aided mapping
  - computer aided tomography
  - computers
    - data processing terminals
    - display devices
    - graphical user interface
    - IBM personal computers
    - Macintosh personal computers
    - multimedia
    - plotters
    - raster scanning
    - remote consoles
    - scene generation
    - scientific visualization
    - tomography
    - windows (computer programs)

**computer information security**

DEF Protective measures to prevent destruction, larceny, and/or unauthorized use of information in computerized files. Used for computer security.

- GS security
  - . computer security
  - . . **computer information security**
- RT access control
  - computer viruses
  - cryptography
  - data processing
  - disk operating system (DOS)
  - electronic commerce
  - firewalls (computers)
  - information resources management
  - operating systems (computers)
  - privacy
  - quantum cryptography
  - selective dissemination of information
  - steganography

*computer methods*

USE **computer programs**

**computer networks**

DEF The interconnection of two or more computers for the mutual or individual processing of data to and from a multitude of terminals or stations by utilizing appropriate switching techniques, transmission systems, or miniprocessors.

- GS networks
  - . **computer networks**
  - . . internets
    - . . . ARPA computer network
    - . . . World Wide Web
  - . . client server systems
  - . . local area networks
  - . . wide area networks
- RT Aloha system
  - carrier sense multiple access
  - computer security
  - distributed interactive simulation
  - distributed processing
  - electronic mail
  - Ethernet
  - firewalls (computers)
  - grid computing (computer networks)
  - interprocessor communication
  - intrusion detection (computers)
  - network control
  - protocol (computers)
  - service oriented architecture
  - VSAT (network)

**computer program integrity**

DEF The completeness of a program to execute its intended function.

- GS integrity
  - . **computer program integrity**
  - reliability
    - . software reliability
    - . . **computer program integrity**
- RT compilers
  - completeness
  - computer viruses
  - computers
  - digital computers
  - errors
  - programs
  - redundancy
  - security

*computer program reliability*

USE **software reliability**

**computer programming**

DEF The preparation of a formalized sequence of instructions that can be recognized and implemented by a computer.

- UF *Legendre code*
- GS **computer programming**
  - . assembler routines
  - . language programming
  - . logic programming
  - . microprogramming
  - . multiprogramming
  - . object-oriented programming
  - . on-line programming
  - . parallel programming
  - . structured programming
  - . symbolic programming
- RT Ada (programming language)
  - addressing
  - ALGOL
  - algorithms
  - APL (programming language)
  - Assembly language
  - autocoders
  - BASIC (programming language)
  - batch processing
  - BCH codes
  - block diagrams
  - C (programming language)
  - coding
  - COMPASS (programming language)
  - computer viruses
  - context free languages
  - data structures



## computer programs

- digital techniques
- expert systems
- file maintenance (computers)
- firmware
- flow charts
- formalism
- format
- Forth (programming language)
- FORTRAN
- HAL/S (language)
- heuristic methods
- kinofom
- linear programming
- LISP (programming language)
- logic design
- machine-independent programs
- MAP (programming language)
- MIMD (computers)
- natural language (computers)
- numerical analysis
- open source licensing (computers)
- Pascal (programming language)
- PL/1
- program verification (computers)
- programmed instruction
- programmers
- ∞ programming
- programming environments
- programming languages
- Prolog (programming language)
- real time operation
- response time (computers)
- reverse engineering
- RISC processors
- run time (computers)
- sequential control
- SIMD (computers)
- software engineering
- software reliability
- software reuse
- systems analysis
- theorem proving
- time sharing
- UNIX (operating system)

### computer programs

- UF *computer codes*
- computer methods*
- software (computers)*
- GS **computer programs**
  - . applications programs (computers)
  - . . NASTRAN
  - . . spreadsheets
  - . . web services
  - . compilers
  - . computer systems programs
  - . . assembler routines
  - . . input/output routines
  - . . operating systems (computers)
  - . . . disk operating system (DOS)
  - . . . UNIX (operating system)
  - . . subroutine libraries (computers)
  - . editing routines (computers)
  - . machine-independent programs
  - . merging routines
  - . multiple output programs
  - . object programs
  - . software development tools
  - . source programs
  - . subroutines
- RT algorithms
- Assembly language
- batch processing
- block diagrams
- coding
- computer viruses
- computers
- data conversion routines
- data flow analysis
- data processing
- data transfer (computers)
- digital computers
- error detection codes
- fixed point arithmetic
- floating point arithmetic
- Goddard Trajectory Determination System
- IBM personal computers
- instruction sets (computers)

- intellectual property
- laser guidance
- machine translation
- Macintosh personal computers
- modularity
- NASA Interactive Planning System
- numerical control
- on-line systems
- programmed instruction
- programming environments
- programs
- report generators
- ∞ routines
- software engineering
- software reliability
- software reuse
- structured programming
- ∞ translators
- user manuals (computer programs)

### computer security

(added February 2003)

DEF Measures and controls taken to prevent unauthorized access, misuse, or destruction of computer systems and networks, software, or the information stored in computer files.

- GS security
  - . **computer security**
  - . . computer information security
  - . . firewalls (computers)
  - . . intrusion detection (computers)
- RT access control
- computer networks
- computer systems design
- computer viruses
- internets
- protocol (computers)

### computer simulation

USE **computerized simulation**

### computer storage devices

- UF *machine storage*
- GS computer components
  - . **computer storage devices**
  - . . bubble memory devices
  - . . buffer storage
  - . . computer compatible tapes
  - . . cryogenic computer storage
  - . . delay lines (computer storage)
  - . . magnetic disks
  - . . magnetic drums
  - . . optical disks
  - . . random access memory
  - . . . carbon nanotube based memory
  - . . . core storage
  - . . . read-only memory devices
  - . . . CD-ROM
  - . . registers (computers)
  - . . . accumulators (computers)
- RT acoustic delay lines
- associative memory
- cards
- central processing units
- ∞ channels
- cryosar
- ∞ equipment
- flip-flops
- hole burning
- magnetic storage
- memory (computers)
- microprocessors
- optical memory (data storage)
- parametrons
- peripheral equipment (computers)
- punched cards
- punched tapes
- random access
- shift registers
- ∞ storage
- thin films

### computer systems design

- GS systems engineering
  - . **computer systems design**
- RT client server systems
- computer security
- concurrent processing
- ∞ design
- disk operating system (DOS)

- distributed processing
- firewalls (computers)
- interprocessor communication
- man machine systems
- operating systems (computers)
- peripheral equipment (computers)
- programmable logic devices
- read-only memory devices
- relational data bases
- service oriented architecture
- software development tools
- software engineering
- ∞ systems
- virtual memory systems

### computer systems performance

DEF The efficiency and reliability that characterize the real operation of the system.

- RT consistency
- data sampling
- efficiency
- evaluation
- operator performance
- output
- ∞ performance
- performance tests
- quality
- reliability
- response time (computers)
- RISC processors
- software reliability
- ∞ systems

### computer systems programs

- GS computer programs
  - . **computer systems programs**
  - . . assembler routines
  - . . input/output routines
  - . . operating systems (computers)
  - . . . disk operating system (DOS)
  - . . . UNIX (operating system)
  - . . subroutine libraries (computers)
- RT algorithms
- application programming interface
- Assembly language
- autocoders
- compilers
- computer viruses
- computers
- data flow analysis
- data processing
- digital computers
- editing routines (computers)
- error detection codes
- report generators
- ∞ routines
- software engineering
- ∞ systems
- systems analysis

### computer systems simulation

DEF Forecasting of computer requirements by the use of predictive modeling and estimating computer workloads.

- GS simulation
  - . systems simulation
  - . . **computer systems simulation**
- RT analog simulation
- data processing equipment
- digital simulation
- hardware description languages
- mathematical models
- operations research
- simulators
- ∞ systems
- systems analysis

### computer techniques

- GS **computer techniques**
  - . computer aided design
  - . . IPAD
  - . . computer aided manufacturing
  - . . computer aided mapping
  - . . computer aided tomography
  - . . computer animation
  - . . computer assisted instruction
- RT adaptive optics
- ARPA computer network
- backpropagation (artificial intelligence)
- belief networks

- computational chemistry
- computers
- decision support systems
- flight management systems
- knowledge based systems
- management information systems
- management methods
- management systems
- microprocessors
- NASTRAN
- numerical differentiation
- on-line systems
- parsing algorithms
- personal computers
- sorting algorithms
- spreadsheets
- word processing

**computer viruses**

(added March 1989)

- RT computer information security
- computer program integrity
- computer programming
- computer programs
- computer security
- computer systems programs
- intrusion detection (computers)
- software engineering

**computer vision**

- DEF Capability of computers to analyze and act on visual input.

- UF *machine vision*

- RT artificial intelligence

- ∞ automation
  - edge detection
  - Gabor filters
  - optical flow (image analysis)
  - pattern recognition
  - position sensing
  - robot sensors
  - robotics
  - robots

*computerized control*

- USE **numerical control**

*computerized design*

- USE **computer aided design**

**computerized simulation**

- DEF Computer-calculated representation of a process, device, or concept in mathematical form. Used for ARIP (impact prediction), automatic rocket impact predictors, computer simulation, and IP (impact prediction).

- UF *ARIP (impact prediction)*
- automatic rocket impact predictors*
- computer simulation*
- IP (impact prediction)*

- GS simulation

. **computerized simulation**

- .. analog simulation
- .. digital simulation
- .. distributed interactive simulation

- RT

- algorithms
- altitude simulation
- computational astrophysics
- computational chemistry
- computational mechanics
- computer aided design
- computer aided manufacturing
- computer aided mapping
- computer animation
- computers
- control simulation
- differential analyzers
- flight simulation
- hardware-in-the-loop simulation
- highly maneuverable aircraft
- hydraulic analogies
- landing simulation
- Lennard-Jones potential
- mathematical models
- ∞ missile simulators
- molecular dynamics
- motion simulators
- multiscale models
- numerical flow visualization
- numerical weather forecasting

- operations research
- scientific visualization
- simulated annealing
- systems simulation
- target simulators
- three dimensional models
- two dimensional models
- virtual reality

**computers**

- GS data processing equipment

. **computers**

- .. analog computers
- .. EAI 680 computer
- .. Honeywell 600/6000 computer
- .. SIGMA 5 computer
- .. Univac 1100 series computers
  - .... Univac 1105 computer
  - .... Univac 1106 computer
  - .... Univac 1107 computer
  - .... Univac 1108 computer
  - .... Univac 1110 computer
- .. CDC computers
  - ... CDC 160-A computer
  - ... CDC 1604 computer
  - ... CDC 3100 computer
  - ... CDC 3200 computer
  - ... CDC 3600 computer
  - ... CDC 3800 computer
  - ... CDC 6000 series computers
    - .... CDC 6400 computer
    - .... CDC 6600 computer
    - .... CDC 6700 computer
  - ... CDC 7000 series computers
    - .... CDC 7600 computer
    - ... CDC 8090 computer
  - ... CDC Cyber 170 series computers
    - .... CDC Cyber 175 computer
    - ... CDC Cyber 74 computer
    - ... CDC Cyber 174 computer
    - ... CDC Cyber 203 computer
    - ... CDC Cyber 205 computer
    - ... CDC Star 100 computer
  - .. counting rate computers
  - .. DDP computers
    - ... DDP 516 computer
  - .. digital computers
    - ... CDC 160-A computer
    - ... CDC 1604 computer
    - ... CDC 3100 computer
    - ... CDC 3200 computer
    - ... CDC 3600 computer
    - ... CDC 3800 computer
    - ... CDC 6000 series computers
      - .... CDC 6400 computer
      - .... CDC 6600 computer
      - .... CDC 6700 computer
    - ... CDC 7000 series computers
      - .... CDC 7600 computer
      - ... CDC 8090 computer
    - ... CDC Cyber 170 series computers
      - .... CDC Cyber 175 computer
      - ... CDC Cyber 74 computer
      - ... CDC Cyber 174 computer
      - ... CDC Cyber 203 computer
      - ... CDC Cyber 205 computer
      - ... CDC Star 100 computer
    - ... EAI 680 computer
    - ... EAI 8400 computer
    - ... EAI 8900 computer
    - ... EMR 6050 computer
    - ... Ferranti Mercury computer
    - ... GE computers
      - .... GE 625 computer
      - .... GE 635 computer
    - ... Hewlett-Packard computers
    - ... Honeywell computers
      - .... DDP 516 computer
      - .... Honeywell 600/6000 computer
      - .... Honeywell ADEPT computer
      - .... Honeywell DDP 116 computer
    - ... IBM 360 computer
    - ... IBM 370 computer
    - ... IBM 650 computer
    - ... IBM 704 computer
    - ... IBM 709 computer
    - ... IBM 1130 computer
    - ... IBM 1401 computer
    - ... IBM 1410 computer

- .. IBM 1620 computer
- .. IBM 2250 computer
- .. IBM 7030 computer
- .. IBM 7040 computer
- .. IBM 7044 computer
- .. IBM 7070 computer
- .. IBM 7074 computer
- .. IBM 7090 computer
- .. IBM 7094 computer
- .. ICL computers
- .. Iliac computers
  - .... Iliac 3 computer
  - .... Iliac 4 computer
- .. microcomputers
  - .... personal computers
    - ..... IBM personal computers
    - ..... Macintosh personal computers
- .. minicomputers
  - .... Nova computers
  - .. Modcomp II computer
  - .. Modcomp IV computer
  - .. parallel computers
    - .... massively parallel processors
      - ..... Connection Machine
      - ..... MIMD (computers)
      - ..... SIMD (computers)
  - .. PDP 15 computer
  - .. PDP computers
    - .... PDP 7 computer
    - .... PDP 8 computer
    - .... PDP 9 computer
    - .... PDP 10 computer
    - .... PDP 11 computer
    - .... PDP 11/20 computer
    - .... PDP 11/40 computer
    - .... PDP 11/45 computer
    - .... PDP 11/50 computer
    - .... PDP 11/70 computer
    - .... PDP 12 computer
    - .. Philco 2000 computer
    - .. Raytheon computers
    - .. RCA spectra 70 computer
    - .. SDS 900 series computers
    - .. SDS 930 computer
    - .. SDS 9300 computer
    - .. SEL computers
    - .. sequential computers
    - .. SIGMA 5 computer
    - .. SIGMA computers
      - .... SIGMA 9 computer
    - .. Solomon computers
      - .... Univac 1100 series computers
      - .... Univac 1105 computer
      - .... Univac 1106 computer
      - .... Univac 1107 computer
      - .... Univac 1108 computer
      - .... Univac 1110 computer
      - .... Univac 80 computer
      - .... Univac 418 computer
      - .... Univac 490 computer
      - .... Univac 494 computer
      - .... Univac 1230 computer
      - .... Univac Larc computer
    - .. VAX computers
      - .... VAX-11 series computers
        - ..... VAX-11/780 computer
    - .. embedded computer systems
    - .. airborne/spaceborne computers
    - .. hybrid computers
    - .. hypercube multiprocessors
    - .. IBM computers
      - ... IBM 360 computer
      - ... IBM 370 computer
      - ... IBM 650 computer
      - ... IBM 704 computer
      - ... IBM 709 computer
      - ... IBM 1130 computer
      - ... IBM 1401 computer
      - ... IBM 1410 computer
      - ... IBM 1620 computer
      - ... IBM 2250 computer
      - ... IBM 7030 computer
      - ... IBM 7040 computer
      - ... IBM 7044 computer
      - ... IBM 7070 computer
      - ... IBM 7074 computer
      - ... IBM 7090 computer
      - ... IBM 7094 computer
    - .. IBM personal computers

## Comsat program

- . . MINOS computer
- . . optical computers
- . . Pegasus computer
- . . RCA computers
  - . . . RCA spectra 70 computer
  - . . . RCA-110 computers
- . . Siemens 2002 computer
- . . site data processors
- . . supercomputers
- . . . Connection Machine
- . . . Cray computers
- . . transputers
- . . Univac computers
  - . . . Univac 1100 series computers
    - . . . . Univac 1105 computer
    - . . . . Univac 1106 computer
    - . . . . Univac 1107 computer
    - . . . . Univac 1108 computer
    - . . . . Univac 1110 computer
  - . . . Univac 80 computer
  - . . . Univac 418 computer
  - . . . Univac 490 computer
  - . . . Univac 494 computer
  - . . . Univac 1230 computer
  - . . . Univac Larc computer
- . . quantum computers

RT applications programs (computers)

arithmetic and logic units

artificial intelligence

automata theory

∞ automation

calculators

central processing units

computation

computer compatible tapes

computer components

computer design

computer graphics

computer program integrity

computer programs

computer systems programs

computer techniques

computerized simulation

control data (computers)

control units (computers)

cybernetics

data converters

data processing

digital to voice translators

file maintenance (computers)

fixed point arithmetic

floating point arithmetic

HAL/S (language)

∞ hardware

information retrieval

information theory

Intel 8080 microprocessor

logic circuits

machine-independent programs

∞ machinery

memory (computers)

multiprocessing (computers)

printers (data processing)

read-only memory devices

real time operation

run time (computers)

telecommunication

vocoders

### Comsat program

GS programs

- . **Comsat program**

RT communication satellites

- Early Bird satellites
- Telstar project
- Telstar satellites

### ComStar C

DEF The third in a series of Comsat domestic communications satellites launched in a transfer orbit by NASA for COMSAT.

GS artificial satellites

- . communication satellites
- . . Communications Technology Satellite
- . . . **ComStar C**

### ComStar satellites

DEF Series of domestic Comsat communication satellites.

GS artificial satellites

- . communication satellites
- . . **ComStar satellites**

RT satellite networks

### concatenated codes

DEF Two or more codes which are encoded and decoded in series.

RT binary codes

∞ codes

- coding
- data transmission
- decoding
- error correcting codes
- redundancy encoding
- Reed-Solomon codes
- signal encoding
- trellis coding

### concavity

RT contour sensors

- contours
- convexity
- flatness
- shapes

∞ surface geometry

### concentrating

RT accumulations

- adsorption
- agglomeration
- beneficiation
- centrifuging
- classifiers
- coagulation
- coalescing
- compressing

∞ concentration

- concentrators
- condensing
- crystallization
- distillation
- drying
- enrichment
- evaporation
- extraction
- filtration
- flocculating
- flotation
- percolation
- precipitation (chemistry)

∞ separation

- separators
- settling
- sorption
- stress concentration
- upgrading
- vaporizing

### ∞ concentration

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF The quantity of a substance contained in a unit quantity of sample.

RT concentrating

- concentration (composition)
- crowding
- filtration
- isotopic enrichment

### concentration (composition)

UF *volume fraction*

GS composition (property)

- . **concentration (composition)**
- . . atom concentration
- . . carbon dioxide concentration
- . . fiber volume fraction
- . . low concentrations
- . . mascons
- . . meteoroid concentration
- . . moisture content
- . . . atmospheric moisture

RT ∞ concentration

- dilution
- particulate sampling
- purity
- quality
- sampling

∞ saturation

solubility

### concentrators

GS **concentrators**

- . spirals (concentrators)

RT accumulators

- centrifuges
- classifiers

∞ classifying

- columns (process engineering)
- concentrating
- evaporators
- filtration
- fluid filters
- precipitators
- radiative heat transfer
- separators
- size separation
- sizing screens
- solar collectors
- stills
- thermal radiation
- traps
- washers (cleaners)

### concentric cylinders

RT ∞ cylinders

- cylindrical shells

### concentric spheres

DEF Structures in which the space between the spheres is utilized for experiments involving fluid flow, etc.

GS symmetrical bodies

- . bodies of revolution
- . . spheres
- . . . **concentric spheres**

RT concentricity

### concentricity

RT ∞ centers

- concentric spheres
- eccentricity

### Concorde aircraft

GS jet aircraft

- . turbofan aircraft
- . . **Concorde aircraft**
- . Sud Aviation aircraft
- . **Concorde aircraft**
- . supersonic aircraft
- . . supersonic transports
- . . **Concorde aircraft**
- . transport aircraft
- . **Concorde aircraft**

RT ∞ aircraft

### concrete structures

DEF Buildings, dams, stadiums, etc., constructed entirely of a mixture of aggregates, water, and Portland cement.

RT aggregates

- breakwaters
- construction
- earthquake resistant structures
- foundations

∞ materials

- rigid structures

∞ structures

- towers

### concretes

DEF Homogeneous mixtures of portland cement, aggregates, and water and which may contain admixtures.

RT admixtures

- aggregates
- cements

∞ construction materials

- grout
- insulation
- masonry
- mortars (material)
- pavements
- structural members

### concurrent engineering

(added September 1994)

DEF Use of multi-disciplinary teams to perform simultaneous design of products and pro-

duction processes from conception through disposal.

- RT design to cost
- ∞ engineering
- industrial management
- life cycle costs
- multidisciplinary research
- product development
- reliability engineering
- systems engineering
- total quality management
- value engineering

#### concurrent processing

- GS data processing
- . **concurrent processing**
- RT architecture (computers)
- computer systems design
- MIMD (computers)
- multiprocessing (computers)
- parallel processing (computers)
- SIMD (computers)

#### condensates

- GS **condensates**
- . Bose-Einstein condensates
- . hydrometeors
- RT Aitken nuclei
- ∞ condensation
- condensers (liquefiers)
- condensing
- contrails
- drop size
- liquefied gases
- plumes
- vapors

#### ∞ condensation

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The physical process by which a vapor becomes a liquid or solid; the opposite of evaporation. Specifically, in meteorology, the transformation from vapor to liquid.
- RT condensates
- condensation nuclei
- condensing
- gas-metal interactions
- liquefaction
- Mayer problem
- rectification

#### condensation nuclei

DEF Liquid or solid particles upon which condensation of water begins in the atmosphere.

- GS **condensation nuclei**
- . Aitken nuclei
- RT aerosols
- cloud physics
- clouds (meteorology)
- ∞ condensation
- condensing
- drops (liquids)
- ice nuclei
- meteorology
- microparticles
- nucleation
- ∞ nuclei
- rain

#### condensation pumps

- GS pumps
- . vacuum pumps
- . . **condensation pumps**
- vacuum apparatus
- . vacuum pumps
- . . **condensation pumps**

#### condensation trails

USE **contrails**

#### condensed matter physics

- RT Bose-Einstein condensates
- matter (physics)
- negative matter
- ∞ physics

∞ solid state physics

#### condenser radiators

USE **condensers (liquefiers)**  
**heat radiators**

#### ∞ condensers

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT capacitors
- condensers (liquefiers)
- jet condensers
- photographic rectifiers

#### condensers (liquefiers)

- UF *condenser radiators*
- GS **condensers (liquefiers)**
- . jet condensers
- RT absorbers (equipment)
- air conditioning
- air conditioning equipment
- cold traps
- columns (process engineering)
- compressors
- condensates
- ∞ condensers
- condensing
- cooling fins
- cooling systems
- distillation equipment
- drying apparatus
- evaporators
- exhaust systems
- film condensation
- heat exchangers
- heat pumps
- liquefied gases
- refrigerating machinery
- separators
- spacecraft radiators
- vaporizers

#### condensing

- UF *gas liquefaction*
- GS **condensing**
- . film condensation
- RT association reactions
- cloud physics
- concentrating
- condensates
- ∞ condensation
- condensation nuclei
- condensers (liquefiers)
- cooling
- dehumidification
- dew point
- distillation
- drop size
- drops (liquids)
- evaporation
- gas-liquid interactions
- gas-metal interactions
- nucleation
- phase change materials
- phase transformations
- refrigerating
- ∞ saturation
- ∞ separation
- sublimation
- supercooling
- supersaturation

#### conditioned reflexes

- GS reflexes
- . **conditioned reflexes**
- RT conditioning (learning)
- reaction time

#### conditioned responses

USE **conditioning (learning)**

#### ∞ conditioning

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT beneficium
- conditioning (learning)
- power conditioning

preconditioning

#### conditioning (learning)

- UF *conditioned responses*
- GS learning
- . **conditioning (learning)**
- RT behavior
- biofeedback
- conditioned reflexes
- ∞ conditioning
- habituation (learning)
- inhibition (psychology)

#### conditioning (treating)

USE **treatment**

#### conditions

- GS **conditions**
- . adiabatic conditions
- . boundary conditions
- . . perfectly matched layers
- . chronic conditions
- . flight conditions
- . Kutta-Joukowski condition
- . Lipschitz condition
- . nonadiabatic conditions
- . nonequilibrium conditions
- . runway conditions
- RT in vitro methods and tests
- in vivo methods and tests

#### Condor missile

- GS missiles
- . air to surface missiles
- . . **Condor missile**

#### conductance

USE **resistance**

#### conducting

USE **conduction**

#### conducting fluids

- SN (EXCLUDES PLASMAS)
- RT conductors
- electrolytes
- ∞ fluids
- magnetohydrodynamics

#### conducting media

USE **conductors**

#### conducting polymers

(added January 1990)

- GS conductors
- . electric conductors
- . . **conducting polymers**
- RT dendrimers
- electroactive polymers
- organic semiconductors
- polyacetylene
- polymeric films
- ∞ polymers
- polypyrroles
- semiconductors (materials)

#### ∞ conduction

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF The transfer of energy within and through a conductor by means of internal particle of molecular activity and without any net external motion. Used for conducting.

- UF *conducting*
- RT attenuation
- conductive heat transfer
- convection
- electric conductors
- electric power transmission
- heat transfer
- heating
- refraction
- sound propagation
- sound transmission
- thermal conductors
- thermal diffusion
- transmission



- deprivation  
isolation  
sensory deprivation
- confirmation*  
USE **proving**
- confluence*  
USE **convergence**
- conformal mapping**  
UF *conformal transformations*  
GS analysis (mathematics)  
. complex variables  
. . . **conformal mapping**  
functions (mathematics)  
. **conformal mapping**  
RT coordinate transformations  
Euler-Cauchy equations  
graphs (charts)  
invariant imbeddings  
isoparametric finite elements  
Jacobi integral  
Lighthill method  
minimal surfaces  
Schwarz-Christoffel transformation  
Theodorsen transformation
- conformal transformations*  
USE **conformal mapping**
- confusion**  
RT entrapment  
tangling
- congeners**  
RT ∞ chemical compounds  
classifications  
isomers  
muscles  
tautomers
- congenital anomalies**  
UF *congenital conditions*  
RT chromosome aberrations  
chromosomes  
genetics  
heredity  
Rhesus factor
- congenital conditions*  
USE **congenital anomalies**
- congestion**  
RT circulation  
ischemia  
pneumonia  
respiratory diseases  
vasodilation
- Congo (Brazzaville)**  
UF *Brazzaville*  
*French Equatorial Congo*  
GS nations  
. **Congo (Brazzaville)**  
RT Africa
- Congo (Kinshasa)*  
USE **Democratic Republic of Congo**
- congresses*  
USE **conferences**
- congressional reports**  
UF *proceedings*  
GS documents  
. **congressional reports**  
reports  
. **congressional reports**  
RT Presidential reports
- congruences**  
GS number theory  
. **congruences**  
RT ∞ coherence  
collocation  
dividing (mathematics)  
geometry  
identities  
integers
- symmetry
- conical bodies**  
UF *conoids*  
GS cones  
. **conical bodies**  
. . . slender cones  
symmetrical bodies  
. bodies of revolution  
. . . **conical bodies**  
. . . slender cones  
RT afterbodies  
axisymmetric bodies
- conical camber**  
GS camber  
. **conical camber**  
RT wing camber
- conical flare*  
USE **cones**
- conical flow**  
GS fluid flow  
. **conical flow**  
RT axisymmetric flow  
baffles  
∞ diffusers  
multiphase flow  
separated flow  
three dimensional flow  
wall flow  
wedge flow
- conical inlets**  
GS intake systems  
. **conical inlets**  
RT air intakes  
conical nozzles  
funnels
- conical nozzles**  
RT annular nozzles  
conical inlets  
convergent nozzles  
convergent-divergent nozzles  
divergent nozzles  
exhaust diffusers  
exhaust nozzles  
hypersonic nozzles  
inlet nozzles  
∞ jet nozzles  
nozzle geometry  
nozzle inserts  
nozzle walls  
∞ nozzles  
plug nozzles  
rocket nozzles  
skirts  
sonic nozzles  
spike nozzles  
spray nozzles  
supersonic nozzles  
transonic nozzles  
turbine exhaust nozzles  
wind tunnel nozzles
- conical scanning**  
DEF Scanning in which the direction of maximum radiation generates a cone whose vertex angle is of the order of the beam width. Such scanning may be either rotating of nutating, according as the direction of polarization rotates or remains unchanged.  
GS scanning  
. **conical scanning**  
RT examination  
field of view  
monitors  
panoramic scanning  
radar scanning  
readers  
reading  
scanners  
searching  
surveillance
- conical shells**  
GS shells (structural forms)  
. **conical shells**
- RT cones
- conics**  
GS geometry  
. Euclidean geometry  
. . . analytic geometry  
. . . **conics**  
. . . . ellipses  
. . . . hyperbolas  
. . . . parabolas  
RT cones  
half cones  
loci
- conifers**  
GS plants (botany)  
. trees (plants)  
. . . **conifers**  
RT deciduous trees  
forests  
timber identification  
∞ trees
- coning motion**  
(added June 1997)  
RT dynamic stability  
gyration  
∞ motion  
motion stability  
nutaton  
precession  
rotation  
spin stabilization  
tumbling motion  
yaw
- conjugate gradient method**  
DEF An interactive method for solving a system of linear equations of dimension N which terminates in at most N steps if no rounding errors are encountered. Each iterate will bring one closer to the solution.  
GS analysis (mathematics)  
. numerical analysis  
. . . iteration  
. . . **conjugate gradient method**  
RT algorithms  
conjugates  
gradients  
iterative solution
- conjugate points**  
GS analysis (mathematics)  
. complex variables  
. . . conjugates  
. . . **conjugate points**  
RT lines of force  
magnetic fields
- conjugated circuits**  
DEF Branches of an electrical network configured so that a change in the electromotive force in either branch does not result in a current change in the other.  
GS circuits  
. **conjugated circuits**
- conjugates**  
GS analysis (mathematics)  
. complex variables  
. . . **conjugates**  
. . . conjugate points  
RT Cholesky factorization  
conjugate gradient method  
conjugation  
finite element method
- conjugation**  
GS **conjugation**  
. phase conjugation  
. . . four-wave mixing  
RT conjugates
- ∞ **conjunction**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT Boolean algebra  
occultation  
orbits  
probability theory

## conjunctiva

set theory

### conjunctiva

GS anatomy  
. sense organs  
. . eye (anatomy)  
. . . **conjunctiva**  
membranes  
. **conjunctiva**  
RT conjunctivitis  
keratitis  
vision

### conjunctivitis

GS diseases  
. eye diseases  
. . **conjunctivitis**  
. infectious diseases  
. . **conjunctivitis**  
RT bacterial diseases  
conjunctiva

### Connecticut

GS nations  
. United States  
. . **Connecticut**  
RT New Haven (CT)

### Connection Machine

(added September 1992)

GS data processing equipment  
. computers  
. . digital computers  
. . . parallel computers  
. . . . massively parallel processors  
. . . . . **Connection Machine**  
. . supercomputers  
. . . **Connection Machine**  
RT architecture (computers)  
interprocessor communication  
multiprocessing (computers)  
parallel processing (computers)

### connections

USE **joints (junctions)**

### connective tissue

GS tissues (biology)  
. **connective tissue**  
. . adipose tissues  
. . bone marrow  
. . cartilage  
RT bones  
collagens  
exoskeletons  
joints (anatomy)  
ligaments  
musculoskeletal system  
tendons

### connectors

GS **connectors**  
. electric connectors  
. umbilical connectors  
. unions (connectors)  
RT adapters  
cordage  
couplings  
disconnect devices  
fasteners  
fittings  
flanges  
flat conductors  
joints (junctions)  
jumpers  
∞ junctions  
linkages  
optical interconnects  
sleeves  
∞ terminals  
yokes

### connectors (electric)

USE **electric connectors**

### conoids

USE **conical bodies**

### consciousness

GS perception

. sensory perception  
. . **consciousness**  
RT attention  
mental performance  
recognition  
sleep deprivation

### consecutive events

GS events  
. **consecutive events**  
RT intervals  
Petri nets  
probability theory  
scheduling  
sequencing  
sequential control  
time measurement

### conservation

GS **conservation**  
. energy conservation  
RT agriculture  
deforestation  
drought  
energy policy  
environment management  
firebreaks  
forest management  
forests  
habitats  
land use  
Newton second law  
nonconservative forces  
parity  
potable water  
regional planning  
rural land use  
soil science  
soils  
water management  
water reclamation

*conservation element and solution element*  
(added June 2002)

USE **space-time CE/SE method**

### conservation equations

RT Bernoulli theorem  
continuity equation  
∞ equations  
nonconservative forces  
space-time CE/SE method  
vorticity transport hypothesis

### conservation laws

GS laws  
. **conservation laws**  
RT CP violation  
momentum theory  
Newton Theory  
nonconservative forces  
space-time CE/SE method

### consistency

DEF A property of a material determined by the complete flow force relation.

RT accuracy  
computer systems performance  
effort  
errors  
leveling  
linearity  
∞ measurement  
∞ performance  
precision  
quality  
ratings  
reliability  
tolerances (mechanics)  
validity  
variability

### consoles

DEF Arrays of controls and indicators for the monitoring and control of a particular sequence of actions, as in the checkout of a rocket, a countdown action, or a launch procedure.

GS **consoles**  
. remote consoles

RT automatic typewriters  
computer components  
control boards  
data processing terminals  
display devices  
∞ equipment  
flat panel displays  
head-up displays  
man machine systems  
manual control

### consolidation

RT ∞ combination  
densification  
liquid phase sintering  
overconsolidation  
stabilization

### consonants (speech)

RT speech  
vowels  
words (language)

### ∞ constant

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT coefficients  
constants  
invariance  
time constant

*constant speed propellers*

USE **variable pitch propellers**

*constant volume balloons*

USE **superpressure balloons**

### constantan

GS alloys  
. **constantan**  
RT copper  
nickel  
thermocouples

### constants

GS **constants**  
. Bohr magneton  
. gravitational constant  
. Gruneisen constant  
. Hubble constant  
. Plancks constant  
. solar constant  
. time constant  
. . . perceptual time constant  
RT coefficients  
∞ constant

### Constellation program

(added July 2007)

DEF A NASA space program to create spacecraft for human spaceflight, consisting primarily of the Ares I and Ares V launch vehicles, the Orion crew capsule, the Earth Departure Stage and the Lunar Surface Access Module. These spacecraft will be capable of performing a variety of missions, from Space Station resupply to lunar landings.

GS programs  
. NASA programs  
. . NASA space programs  
. . . **Constellation program**  
. space programs  
. . NASA space programs  
. . . **Constellation program**  
RT Altair Lunar Lander  
Ares 1 launch vehicle  
Ares 5 cargo launch vehicle  
Crew Exploration Vehicle  
manned space flight  
space exploration

### constellations

DEF Originally conspicuous configurations of stars; now regions of the celestial sphere marked by arbitrary boundary lines.

GS **constellations**  
. Andromeda Constellation  
. Aries constellation  
. Auriga constellation  
. Cassiopeia constellation

- . Centaurus constellation
- . Cepheus constellation
- . Corona Borealis constellation
- . Cygnus constellation
- . Lyra constellation
- . Orion constellation
- . Sagittarius constellation
- . Scorpius constellation
- . Scutum constellation
- . Taurus constellation

RT celestial sphere  
planispheres  
stars  
zodiac

**Constellation-X**

(added February 2006)

DEF Astronomical observatory comprised of several x-ray satellites orbiting in close proximity to each other and working in unison to generate the observing power of one giant telescope.

UF *Con-X observatory*

GS artificial satellites  
. scientific satellites  
. . astronomical satellites  
. . . **Constellation-X**

networks  
. satellite networks  
. . satellite constellations  
. . . **Constellation-X**

observatories  
. astronomical observatories  
. . astronomical satellites  
. . . **Constellation-X**

telescopes  
. spaceborne telescopes  
. . **Constellation-X**  
. x ray telescopes  
. . **Constellation-X**

RT spaceborne astronomy  
x ray astronomy

**constitution**

RT atomic structure  
governments  
law (jurisprudence)

*constitutional diagrams*

USE **phase diagrams**

**constitutive equations**

RT electric fields  
∞ equations  
magnetic charge density  
magnetic fields  
magnetic flux

**constraints**

UF *hindrance*  
*limitations*  
*restraints*

GS **constraints**  
. meteorological parameters  
. . Brunt-Vaisala frequency

RT blocking  
constrictions  
dynamic programming  
∞ holding  
linear programming  
nonlinear programming  
operations research  
optimization  
penalty function  
range (extremes)  
retaining

**constrictions**

UF *restrictions*

RT ∞ barriers  
blocking  
chokes (restrictions)  
closures  
constraints  
contracts  
impedance  
plugging  
∞ resistance  
retarders (devices)  
seals (stoppers)

stopping

**constrictors**

GS anatomy  
. musculoskeletal system  
. . muscles  
. . . **constrictors**

**construction**

SN (EXCLUDES TYPES OF STRUCTURES)  
UF *erection*

RT architecture  
assembling  
bridges (structures)  
buildings  
caissons  
concrete structures  
∞ construction materials  
contractors  
contracts  
∞ design  
excavation  
fabrication  
highways  
inspection  
installing  
layouts  
maintenance  
masonry  
quality control  
reconstruction  
rigging  
shipyards  
space manufacturing  
Starsite program  
steel structures  
stress analysis  
structural analysis  
structural design  
structural engineering  
structural members  
surveys  
tunneling (excavation)  
welding

*construction in space*

USE **orbital assembly**

**construction industry**

GS industries  
. **construction industry**

RT bridges (structures)  
buildings  
contractors  
industrial areas  
industrial plants  
towers  
trusses

∞ **construction materials**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *building materials*  
*structural materials*

RT aggregates  
aircraft construction materials  
aircraft survivability  
airframe materials  
architecture  
bitumens  
boards (paper)  
bricks  
cements  
composite materials  
concretes  
construction  
graphite-epoxy composites  
grout  
insulation  
lathes  
Masonite (trademark)  
masonry  
∞ materials  
materials selection  
panels  
plastics  
polymer matrix composites  
protective coatings  
reactor materials  
skin (structural member)

spacecraft construction materials  
structural members

**consulting**

RT conferences  
management planning  
personnel  
resources

**consumables (spacecraft)**

DEF All supplies for spacecraft and spacecrews that will be consumed during a mission.

GS **consumables (spacecraft)**

. storable propellants  
RT consumables (spacecrew supplies)  
in situ resource utilization  
propellant storage  
space logistics  
working fluids

**consumables (spacecrew supplies)**

GS **consumables (spacecrew supplies)**

. space rations  
RT clothing  
consumables (spacecraft)  
dehydrated food  
∞ food  
food production (in space)  
hygiene  
potable water  
provisioning  
sanitation  
space flight feeding  
space logistics  
survival equipment

**consumers**

RT consumption  
market research  
marketing  
product development

**consumption**

GS **consumption**  
. energy consumption  
. fuel consumption  
. oxygen consumption  
. propellant consumption  
. water consumption

RT commerce  
consumers  
demand (economics)  
depletion  
exhausting  
exhaustion  
supplying  
utilization

**contact dermatitis**

GS diseases  
. infectious diseases  
. . dermatitis  
. . . **contact dermatitis**

RT allergic diseases  
dermatology  
epidermis  
itching  
skin (anatomy)

**contact lenses**

GS lenses  
. **contact lenses**

RT eyepieces  
reticles

**contact loads**

DEF Dynamic loading by contact between two bodies.

GS loads (forces)  
. **contact loads**  
. . impact loads  
. . rolling contact loads

RT compression loads  
dynamic pressure  
random loads  
shock loads  
∞ sliding contact



## contact potentials

transient loads

### contact potentials

DEF The potential differences at the junctions of two dissimilar substances.

- GS potential energy
  - . electric potential
  - . . **contact potentials**
- RT electric contacts
  - surface properties

### contact resistance

DEF The resistance to current flow between two touching bodies, consisting of constriction resistance and film resistance.

- GS electrical properties
  - . electrical impedance
  - . . electrical resistance
  - . . . **contact resistance**
- impedance
  - . electrical impedance
  - . . electrical resistance
  - . . . **contact resistance**
- RT electric contacts
  - nonohmic effect
- ∞ resistance
  - surface properties

### contactors

- SN (EXCLUDES ELECTRIC SWITCHES)
- RT carburetors
  - chemical reactors
  - columns (process engineering)
  - electric switches
  - mixers
  - sprayers

*contacts (electric)*

USE **electric contacts**

### contacts (geology)

- GS geology
  - . **contacts (geology)**
- RT formations
  - metamorphism (geology)
  - mineral deposits
  - rock intrusions
  - rocks

### containerless melts

- GS melts (crystal growth)
  - . **containerless melts**
- RT crystal growth
  - crystallization
  - crystals
  - directional solidification (crystals)
  - liquid bridges
  - low gravity manufacturing
  - manufacturing
  - melting
  - orbital workshops
  - space processing
  - weightlessness

### ∞ containers

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF A non-specific term for receptacles capable of closure. Used for receptacles (containers).
- UF *receptacles (containers)*
- RT ampoules
  - autoclaves
  - bags
  - barrels (containers)
  - baskets
  - biopaks
  - bottles
  - boxes (containers)
  - bundles
  - cans
  - ∞ capsules
  - cartridges
  - cases (containers)
  - crucibles
  - disposal
  - drums (containers)
  - enclosures
  - fuel tanks
  - glassware

hoppers

- housings
- materials handling
- micromodules
- packages
- packaging
- preserving
- pressure vessels
- protectors
- reels
- spools
- sprayers
- tanks (containers)
- transporter
- trays
- wing tanks

### containment

- RT asteroid capture
  - blocking
  - burst tests
  - confinement
  - retaining
  - sealing
  - stopping

### contaminants

- UF *noxious materials*
  - pollutants*
- GS **contaminants**
  - . radioactive contaminants
  - . trace contaminants
- RT biofilms
  - biomass burning
  - chlorofluorocarbons
  - chlorofluoromethane
  - contamination
  - decontamination
  - diluents
  - dirt
  - dust
  - effluents
  - environment effects
  - environmental quality
  - fuel contamination
  - hazardous materials
  - hazardous wastes
  - heavy metals
  - impurities
  - ∞ materials
  - nonpoint sources
  - particulates
  - pollution
  - purity
  - quality
  - soil pollution
  - volatile organic compounds
  - wastes
  - water treatment

### contamination

- GS **contamination**
  - . fuel contamination
  - . spacecraft contamination
- RT air pollution
  - antifouling
  - antiinfectives and antibacterials
  - biological hazards
  - contaminants
  - decontamination
  - environment effects
  - fouling
  - intrusion
  - molecular shields
  - nonpoint sources
  - planetary protection
  - pollution
  - purity
  - radioactive wastes
  - water pollution

### content

- GS **content**
  - . bone mineral content
- RT ∞ components
  - ∞ composition

ingredients

*content-addressable memory*  
(added December 1999)

USE **associative memory**

### context

DEF The composition, structure, or manner in which something is put together. Also refers to the situation or environment of an event.

- RT natural language (computers)
- pattern recognition

### context free languages

- GS languages
  - . programming languages
  - . . **context free languages**
- RT computer programming
  - symbolic programming

### continental drift

- RT continents
  - Earth crust
  - Earth planetary structure
  - geomagnetism
  - geophysics
  - paleomagnetism

*continental margins*

USE **continental shelves**

### continental shelves

DEF The ocean floor that is between the shoreline and the abyssal ocean floor, including various provinces; the continental shelf; continental borderland; continental slope; and the continental rise. Used for continental margins.

UF *continental margins*

- RT geology
  - ocean bottom
  - seamounts
- ∞ shelves

### continents

- GS **continents**
  - . Africa
  - . Asia
  - . Australia
  - . Europe
  - . . Central Europe
  - . North America
  - . South America
- RT Antarctic regions
  - Central Europe
  - continental drift
  - cratons
  - geography
  - mountains
  - transcontinental systems

### contingency

- RT confidence limits
  - correlation
  - estimates
  - expectation
  - materials handling
  - predictions
  - reserves
  - risk

### continuity

- RT continuity (mathematics)
  - coordination
  - scheduling
  - topology
  - variability

### continuity (mathematics)

- GS analysis (mathematics)
  - . calculus
  - . . **continuity (mathematics)**
- RT continuity
  - functions (mathematics)
  - isoperimetric problem
  - normal density functions
  - Poisson density functions
  - probabilistic density functions
  - regularity
  - statistical analysis
  - symmetry

topology

**continuity equation**

- RT conservation equations
- continuum mechanics
- Crocco-Lee theory
- ∞ equations
- equations of motion
- equations of state
- fluid dynamics
- nonconservative forces
- steady flow

*continuous flow electrophoresis*USE **electrophoresis****continuous noise**

- RT ∞ noise
- noise propagation
- sound generators

**continuous radiation**

- UF *continuous waves*
- GS **continuous radiation**
- . modulated continuous radiation
- RT absorption spectra
- background radiation
- coherent radiation
- corpuseular radiation
- elastic waves
- electromagnetic radiation
- emission spectra
- pulsed radiation
- ∞ radiation
- ∞ rays

**continuous spectra**

DEF Spectra in which wavelengths, wave numbers, and frequencies are represented by the continuum of real numbers or a portion thereof, rather than by a discrete sequence of numbers. For electromagnetic radiation, spectra that exhibit no detailed structure and represent a gradual variation of intensity with wavelength from one end to the other, as the spectra of incandescent solids. For particles, spectra that exhibit a continuous variation of the momentum or energy.

- GS spectra
- . **continuous spectra**
- RT astronomical spectroscopy
- solar spectra
- spectral emission
- stellar spectra

**continuous wave lasers**

- GS stimulated emission devices
- . lasers
- . . **continuous wave lasers**
- RT argon lasers
- carbon dioxide lasers
- carbon monoxide lasers
- chemical oxygen-iodine lasers
- laser stability
- solid state lasers

**continuous wave radar**

- UF *CW radar*
- GS radar
- . **continuous wave radar**
- RT coherent radar
- Doppler radar
- pulse radar
- radar detection
- radar range
- search radar
- surveillance radar
- tracking radar

*continuous waves*USE **continuous radiation****continuum flow**

- GS fluid flow
- . gas flow
- . . **continuum flow**
- RT free molecular flow
- molecular flow
- rarefied gas dynamics

slip flow

**continuum mechanics**

- GS mechanics (physics)
- . **continuum mechanics**
- RT Burger equation
- classical mechanics
- computational mechanics
- continuity equation
- continuum modeling
- ∞ dynamics
- flow theory
- fluid mechanics
- Maxwell bodies
- multipolar fields
- solid mechanics
- statistical mechanics
- stress tensors

**continuum modeling**

- RT continuum mechanics
- continuum
- large space structures
- mathematical models
- structural analysis

**continuum**

DEF Things that are continuous, which have no discrete parts as the continuum of real numbers as opposed to the sequence of discrete integers, as the background continuum of a spectrogram due to thermal radiation.

- RT continuum modeling
- probability theory
- real variables
- relativity
- topology

*CONTOUR (mission)**(added February 1999)*USE **Comet Nucleus Tour****contour sensors**

DEF The sensing of image coincidences by means of optical processing techniques.

- RT boundaries
- concavity
- contours
- convexity
- imagery
- images
- ∞ sensors
- shapes
- topography

**contours**

- UF *curved surfaces*
- RT concavity
- contour sensors
- convexity
- curved panels
- datum (elevation)
- elevation
- flatness
- geomorphology
- hypsography
- mapping
- roughness
- shapes
- topography

**contract incentives**

- GS incentives
- . **contract incentives**
- motivation
- . **contract incentives**

**contract management**

- GS management
- . **contract management**
- RT contracts
- decision making
- decisions
- PERT
- project management
- schedules
- subcontracts

systems engineering

**contract negotiation**

- RT contractors
- contracts
- decision making
- government/industry relations
- industries
- management
- manufacturing
- subcontracts

**contraction**

- RT cooling
- ∞ reduction
- shrinkage
- spasms

**contractors**

- RT columns (process engineering)
- construction
- construction industry
- contract negotiation
- contracts
- government/industry relations
- industries
- qualifications
- subcontracts
- transportation

**contracts**

- GS **contracts**
- . insurance (contracts)
- . subcontracts
- RT agreements
- cancellation
- constrictions
- construction
- contract management
- contract negotiation
- contractors
- estimates
- estimating
- extensions
- federal budgets
- government procurement
- government/industry relations
- grants
- leasing
- legal liability
- options
- procurement
- projects
- proposals
- revisions
- supplements

**contrails**

DEF Condensation trails. Artificial clouds made by the exhaust of jet aircraft.

- UF *condensation trails*
- vapor trails*
- RT condensates
- wakes

**contralateral functions**

- RT ∞ functions

**contrarotating propellers**

DEF Two propellers mounted on concentric shafts having a common drive and rotating in opposite directions.

- GS propellers
- . **contrarotating propellers**
- RT propeller drive
- propeller efficiency
- turboprop engines

**contrast**

DEF In general, the degree of differentiation between different tones in an image.

- GS **contrast**
- . image contrast
- . phase contrast
- RT character recognition
- color
- legibility
- perception
- printing
- resolution

## control

∞ sharpness  
visibility  
vision

### ∞ control

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *control systems*  
*controlled stability*  
*regulation*

RT access control  
active control  
adaptive control  
air navigation  
air traffic control  
aircraft control  
altitude control  
approach control  
astrionics  
attitude control  
automatic control  
automatic control valves  
automatic flight control  
automatic frequency control  
automatic gain control  
avionics  
biofeedback  
boundary layer control  
cascade control  
chemical reaction control  
circulation control airfoils  
circulation control rotors  
combustion control  
command and control  
control boards  
control configured vehicles  
control data (computers)  
control equipment  
control moment gyroscopes  
control rockets  
control rods  
control simulation  
control stability  
control sticks  
control surfaces  
control systems design  
control theory  
control units (computers)  
control valves  
controllability  
controlled atmospheres  
controlled fusion  
controllers  
critical path method  
cybernetics  
direct lift controls  
directional control  
dynamic characteristics  
dynamic control  
electric control  
electronic control  
elevators (control surfaces)  
engine control  
environmental control  
feedback control  
feedforward control  
fire control  
fire control circuits  
flaps (control surfaces)  
flight control  
flood control  
fluidics  
fly by tube control  
fly by wire control  
frequency control  
fuel control  
ground based control  
harmonic control  
helicopter control  
hydraulic control  
integrated mission control center  
interactive control  
inventory controls  
jet control  
lateral control  
linear parameter-varying control  
linear quadratic Gaussian control  
linear quadratic regulator  
longitudinal control

magnetic control  
manual control  
MIMO (control systems)  
missile control  
model reference adaptive control  
multivariable control  
network control  
nuclear reactor control  
numerical control  
off-on control  
optical control  
optimal control  
payload control  
phase control  
plasma control  
pneumatic control  
pointing control systems  
pollution control  
porous boundary layer control  
process control (industry)  
proportional control  
quality control  
radar approach control  
radio control  
∞ reaction control  
regulations  
regulators  
regulatory mechanisms (biology)  
remote control  
robot control  
rocket engine control  
satellite attitude control  
satellite control  
scheduling  
self adaptive control systems  
sequential control  
servocontrol  
servomechanisms  
shape control  
shock wave control  
SISO (control systems)  
spacecraft control  
spectral shift control  
spectral shift control reactor  
speed control  
stabilization  
steering  
Submarine Integrated Control project  
systems engineering  
tabs (control surfaces)  
temperature control  
thermal control coatings  
thrust control  
thrust vector control  
time optimal control  
traffic control  
trajectory control  
Transit Attitude Control satellite  
transponder control group  
turbojet engine control  
variable stream control engines  
visual control  
voice control  
wave incidence control  
weather modification

### control boards

UF *control panels*  
RT consoles

∞ control  
display devices  
manual control  
remote control

### control configured vehicles

RT aircraft configurations  
aircraft design  
∞ control  
flight control  
technology utilization  
∞ vehicles

### control data (computers)

RT computers  
∞ control  
∞ data

data systems

### control devices

USE **control equipment**

### control equipment

UF *control devices*  
GS **control equipment**  
. control sticks  
. pressure switches  
. regulators  
. . . automatic control valves  
. . . pressure regulators  
. . . relief valves  
. . . cryostats  
. . . current regulators  
. . . flow regulators  
. . . fuel flow regulators  
. . . oxygen regulators  
. . . speed regulators  
. . . thermostats  
. . . voltage regulators  
. servoamplifiers  
. teleoperators

RT aircraft control  
automatic control

∞ control

∞ effectors

electric control  
electronic control  
feedback control  
manipulators  
manual control  
nonlinear systems  
off-on control  
optical control  
pneumatic control  
proportional control  
recording instruments  
speed control  
transducers

### control moment gyroscopes

GS gyroscopes

. **control moment gyroscopes**

RT attitude control  
attitude gyros  
attitude indicators

∞ control

equations of motion  
gimbals  
gyrodampers  
indicating instruments  
measuring instruments  
nutation dampers  
servocontrol  
servomechanisms

### control panels

USE **control boards**

### control rockets

DEF Vernier engines, retrorockets, or other such rockets, used to change the attitude of, guide, or make small changes in the speed of a rocket, spacecraft, or the like. Used for steering rockets.

UF *steering rockets*

GS engines

. rocket engines  
. . Vernier engines  
. . . **control rockets**  
. torpedo engines  
. . Vernier engines  
. . . **control rockets**

RT ∞ control

retrorocket engines  
steering  
thrust control  
variable thrust

### control rods

GS rods

. **control rods**

RT ∞ control

neutron absorbers  
nuclear reactor control  
nuclear reactors  
poisoning (reaction inhibition)  
reactor cores

reactor safety

**control simulation**  
 GS simulation  
 . **control simulation**  
 RT aircraft control  
 computerized simulation  
 ∞ control  
 control theory  
 flight simulation  
 flight simulators  
 hardware-in-the-loop simulation  
 motion simulators  
 spacecraft control  
 spacecraft maneuvers  
 training simulators

**control stability**  
 GS dynamic characteristics  
 . dynamic stability  
 . . **control stability**  
 stability  
 . dynamic stability  
 . . **control stability**  
 RT aircraft control  
 aircraft spin  
 aircraft stability  
 ∞ control  
 controllability  
 flight control  
 loop transfer recovery  
 MIMO (control systems)  
 motion stability  
 Nyquist diagram  
 pilot induced oscillation  
 robustness (mathematics)  
 sampled data systems  
 SISO (control systems)  
 spacecraft motion  
 spacecraft stability  
 stability augmentation  
 systems stability

**control sticks**  
 GS control equipment  
 . **control sticks**  
 RT aircraft control  
 ∞ control  
 flight control  
 manual control

**control surfaces**  
 GS **control surfaces**  
 . ailerons  
 . . flaperons  
 . . spoiler slot ailerons  
 . elevators (control surfaces)  
 . elevons  
 . flaps (control surfaces)  
 . . externally blown flaps  
 . . . upper surface blown flaps  
 . . flaperons  
 . . jet flaps  
 . . split flaps  
 . . wing flaps  
 . . . leading edge flaps  
 . . . leading edge slats  
 . . . trailing edge flaps  
 . . . vortex flaps  
 . guide vanes  
 . . jet vanes  
 . horizontal tail surfaces  
 . rudders  
 . . aerial rudders  
 . . marine rudders  
 . spoilers  
 . tabs (control surfaces)  
 RT aerodynamic brakes  
 aerodynamic configurations  
 aerodynamic interference  
 aerodynamics  
 aircraft parts  
 aircraft structures  
 airfoils  
 airframes  
 blunt trailing edges  
 boundary layer control  
 canard configurations  
 ∞ control  
 drag devices

fins  
 fires  
 flight control  
 free wing aircraft  
 guidance (motion)  
 nose fins  
 stabilizers (fluid dynamics)  
 ∞ surfaces  
 sweptback tail surfaces  
 T tail surfaces  
 tail assemblies  
 tail surfaces  
 trapezoidal tail surfaces  
 vanes  
 wings

*control systems*  
 USE **control**

**control systems design**  
 GS systems engineering  
 . **control systems design**  
 RT aerospace systems  
 automatic control  
 ∞ automation  
 bionics  
 bond graphs  
 ∞ control  
 control theory  
 controllers  
 cybernetics  
 ∞ design  
 design analysis  
 electric control  
 electronic control  
 feedback control  
 frequency domain analysis  
 genetic algorithms  
 H-2 control  
 H-infinity control  
 linear parameter-varying control  
 linear quadratic Gaussian control  
 linear quadratic regulator  
 loop transfer functions  
 loop transfer recovery  
 mathematical models  
 membership functions  
 MIMO (control systems)  
 numerical control  
 operations research  
 optimal control  
 parameter identification  
 robot control  
 SISO (control systems)  
 system identification  
 systems analysis  
 systems integration  
 time domain analysis  
 uncertain systems

**control theory**  
 RT adaptive control  
 closed cycles  
 ∞ control  
 control simulation  
 control systems design  
 controllability  
 distributed parameter systems  
 dynamic control  
 dynamical systems  
 feedback  
 feedback control  
 feedforward control  
 games  
 H-2 control  
 H-infinity control  
 interactive control  
 linear quadratic Gaussian control  
 linear quadratic regulator  
 loop transfer recovery  
 MIMO (control systems)  
 model reference adaptive control  
 multivariable control  
 observability (systems)  
 off-on control  
 optimal control  
 robot control  
 robustness (mathematics)  
 sampled data systems  
 servocontrol

shape control  
 SISO (control systems)  
 ∞ theories  
 tracking problem  
 uncertain systems

**control units (computers)**  
 DEF Those parts of computers that cause the arithmetic unit, storage, and transfer of a computer to operate in proper sequence.  
 RT central processing units  
 computer components  
 computers  
 ∞ control  
 data processing equipment

**control valves**  
 GS valves  
 . **control valves**  
 RT actuators  
 ∞ control  
 pneumatic control

**controllability**  
 DEF The capability of an aircraft, rocket, or other vehicle to respond to control, especially in direction or attitude. Used for handling qualities.  
 UF *handling qualities*  
 RT aircraft control  
 aircraft performance  
 aircraft specifications  
 aircraft spin  
 aircraft stability  
 ∞ control  
 control stability  
 control theory  
 directional stability  
 flight characteristics  
 helicopter control  
 helicopter performance  
 liquid sloshing  
 low speed stability  
 maneuverability  
 pilot ratings  
 quality  
 spacecraft reliability  
 stability  
 steering  
 wheel brakes

**controlled atmospheres**  
 GS **controlled atmospheres**  
 . argon-oxygen atmospheres  
 . cabin atmospheres  
 . . spacecraft cabin atmospheres  
 . helium-oxygen atmospheres  
 . inert atmosphere  
 RT air conditioning  
 ∞ atmospheres  
 ∞ blankets  
 clean rooms  
 ∞ control  
 environments  
 furnaces  
 gas mixtures  
 gnotobiotics  
 oxygen supply equipment  
 spacecraft environments

*controlled avalanche transit time devices*  
 USE **CATT devices**

**controlled fusion**  
 SN (CONTROLLED NUCLEAR FUSION)  
 GS nuclear reactions  
 . thermonuclear reactions  
 . . nuclear fusion  
 . . . **controlled fusion**  
 RT ∞ control  
 Joint European Torus  
 limiters (fusion reactors)  
 plasma compression  
 plasma cooling  
 plasma currents  
 plasma physics  
 relativistic electron beams  
 strongly coupled plasmas  
 thermonuclear power generation

## controllers

zeta pinch

*controlled stability*  
USE **control**

### controllers

SN (LIMITED TO DEVICES AND CONTROL THEORY)

#### GS controllers

. power factor controllers  
. servomechanisms  
. . . servoamplifiers  
. . . servomotors

#### RT

actuators  
analyzers  
automatic control  
∞ automation  
∞ control  
control systems design  
cryostats  
current regulators  
cybernetics  
electronic control  
H-2 control  
H-infinity control  
instrument receivers  
instrument transmitters  
∞ instruments  
linear quadratic regulator  
measuring instruments  
optical control  
pneumatic control  
pressure regulators  
programmable logic devices  
propellant actuated instruments  
regulators  
remote control  
rocket-borne instruments  
speed control  
speed regulators  
temperature control  
thermostats  
voltage regulators

*Convair 340 aircraft*

USE **CV-340 aircraft**

*Convair 440 aircraft*

USE **CV-440 aircraft**

*Convair 880 aircraft*

USE **CV-880 aircraft**

*Convair 990 aircraft*

USE **CV-990 aircraft**

### convection

DEF In general, mass motion within a fluid resulting in transport and mixing of the properties of that fluid. Specifically, in meteorology, atmospheric motions that are predominately vertical.

#### GS

##### convection

. forced convection  
. free convection  
. . . Rayleigh-Benard convection  
. . . Benard cells  
. stellar convection  
. . . solar convection (astronomy)  
. surface tension driven convection  
. . . Marangoni convection

#### RT

advection  
base heating  
Boussinesq approximation  
buoyancy-driven flow  
∞ conduction  
convection cells  
convection-diffusion equation  
fluid dynamics  
Grashof number  
heat transmission  
heating  
meteorology  
mixing height  
mixing layers (fluids)  
stellar interiors

### convection cells

(added June 1990)

RT atmospheric circulation  
convection

convection currents  
convective flow  
convective heat transfer

### convection clouds

GS clouds (meteorology)  
. **convection clouds**  
. . . arc clouds  
. . . cumulonimbus clouds  
. . . anvil clouds  
. . . cumulus clouds  
. . . anvil clouds  
RT air currents  
cloud physics  
meteorology  
nephanalysis  
supercooling  
vertical air currents

### convection currents

RT air currents  
Benard cells  
convection cells  
convection-diffusion equation  
electron bunching  
fluid flow  
free convection  
mixing height  
Rayleigh-Benard convection  
solar convection (astronomy)  
solar granulation  
stellar convection  
vertical air currents

### convection-diffusion equation

(added August 1991)

DEF An equation for convection and diffusion, in which the rate of change with respect to time of the density (concentration) of the convecting/diffusing substance at a fixed point in space plus the product of the divergence of the velocity field and the density of the convecting/diffusing substance equals the product of the diffusion coefficient and the differential of the density of the convecting/diffusing substance.

UF *diffusion-convection equation*

#### RT

Benard cells  
computational fluid dynamics  
convection  
convection currents  
convective flow  
diffusion  
diffusion coefficient  
∞ equations  
flow equations  
flow theory  
Rayleigh-Benard convection  
reaction-diffusion equations

### convective flow

UF *thermal currents*

#### GS

##### fluid flow

##### . convective flow

. . . Rayleigh-Benard convection  
. . . Benard cells  
. . . buoyancy-driven flow

#### RT

convection cells  
convection-diffusion equation  
free convection  
gas density  
geophysical fluid flow cells  
heat transmission  
Marangoni convection  
mass flow rate  
mass transfer  
porous boundary layer control  
solar convection (astronomy)  
stellar convection  
surface tension driven convection  
temperature  
thermal diffusion

### convective heat transfer

GS transmission  
. heat transmission  
. . . heat transfer  
. . . **convective heat transfer**  
RT aerodynamic heating  
boundary layer combustion  
boundary layer flow

Brinkman number  
conductive heat transfer  
convection cells  
cooling fins  
forced convection  
free convection  
laminar heat transfer  
mass transfer  
Nusselt number  
radiative heat transfer  
Rayleigh-Benard convection  
surface cooling  
temperature gradients  
thermohydraulics  
thermosiphons  
turbulent heat transfer

### conventions

RT agreements  
air law  
compatibility  
conferences  
∞ cooperation  
international cooperation  
international law  
outer space treaty  
standards

### convergence

DEF Approach to a limit, e.g., by an infinite sequence. Used for confluence.

UF *confluence*

#### RT

divergence  
patch tests  
regularity  
tapering  
variability

### convergent nozzles

RT conical nozzles  
fluid amplifiers  
nozzle geometry  
nozzle walls  
∞ nozzles  
turbine engines  
turbojet engines

### convergent-divergent nozzles

UF *de Laval nozzles*

#### GS

##### exhaust nozzles

##### . convergent-divergent nozzles

#### RT

conical nozzles  
nozzle geometry  
nozzle inserts  
∞ nozzles  
rocket nozzles  
supersonic nozzles  
transonic nozzles  
turbine exhaust nozzles  
wind tunnel nozzles

### conversation

GS communicating  
. verbal communication  
. . . **conversation**  
speech  
. **conversation**  
RT voice communication  
words (language)

### ∞ conversion

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT bioconversion  
conversion tables  
data conversion routines  
electric generators  
energy conversion  
energy conversion efficiency  
exchanging  
frequency converters  
geothermal energy conversion  
internal conversion  
isomerization  
liquefaction  
metrification  
ocean thermal energy conversion  
organic wastes (fuel conversion)  
ortho para conversion  
photothermal conversion

- photovoltaic conversion  
 refining  
 satellite solar energy conversion  
 solar energy conversion  
 solar total energy systems  
 thermionic power generation  
 thermoelectric power generation  
 turbogenerators  
 waterwave energy conversion
- conversion tables**  
 GS tables (data)  
   . **conversion tables**  
 RT ∞ conversion  
   data converters  
   International System of Units  
   units of measurement
- convertiplanes*  
 USE **V/STOL aircraft**
- ∞ **converters**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF Rotary devices for changing alternating current to direct current. Transducers whose output is a different frequency from its input.  
 RT analog to digital converters  
   binary to decimal converters  
   current converters (AC to DC)  
   data converters  
   digital to analog converters  
   direct power generators  
   down-converters  
   electric generators  
   frequency converters  
   image converters  
   instrument transformers  
   inverted converters (DC to AC)  
   parametric frequency converters  
   power converters  
   pulse width amplitude converters  
   pyrometallurgy  
   solar blankets  
   thermionic converters  
   torque converters  
   transducers  
   transformers  
   up-converters  
   voltage converters (AC to AC)  
   voltage converters (DC to DC)
- convertible fan-shaft engines**  
 GS engines  
   . air breathing engines  
   . . gas turbine engines  
   . . . jet engines  
   . . . . turbojet engines  
   . . . . . turbofan engines  
   . . . . . **convertible fan-shaft engines**  
   . aircraft engines  
   . . **convertible fan-shaft engines**  
   . internal combustion engines  
   . . gas turbine engines  
   . . . jet engines  
   . . . . turbojet engines  
   . . . . . turbofan engines  
   . . . . . **convertible fan-shaft engines**  
   . turbine engines  
   . . gas turbine engines  
   . . . jet engines  
   . . . . turbojet engines  
   . . . . . turbofan engines  
   . . . . . **convertible fan-shaft engines**  
 RT helicopter engines  
   jet thrust  
   propulsion system configurations  
   rotary wings  
   TF-34 engine  
   turboshafts  
   V/STOL aircraft  
   variable cycle engines  
   vertical takeoff aircraft
- convexity**  
 GS shapes
- . **convexity**  
 RT concavity  
   contour sensors  
   contours  
   flatness  
   lenticular bodies  
   ∞ surface geometry
- conveyors**  
 RT automated guideway transit vehicles  
   automated transit vehicles  
   chutes  
   cranes  
   elevators (lifts)  
   feeders  
   forks  
   ∞ lifts  
   materials handling  
   ribbons  
   rollers  
   scoops  
   ∞ tracks  
   transportation
- convolution integrals**  
 UF *convolutions (mathematics)*  
 GS analysis (mathematics)  
   . functional analysis  
   . . **convolution integrals**  
   integrals  
   . **convolution integrals**  
 RT integral transformations  
   trellis coding
- convolutions (mathematics)*  
 USE **convolution integrals**
- convulsions**  
 RT human pathology  
   muscles  
   psychotherapy  
   séizures  
   ∞ shock
- Con-X observatory*  
 (added February 2006)  
 USE **Constellation-X**
- Cook Inlet (AK)**  
 GS landforms  
   . inlets (topography)  
   . . **Cook Inlet (AK)**  
 RT Alaska
- Cookpot aircraft*  
 USE **TU-124 aircraft**
- cool stars**  
 GS celestial bodies  
   . stars  
   . . late stars  
   . . . **cool stars**  
   . . . . carbon stars  
   . . . . flare stars  
   . . . . K stars  
   . . . . M stars  
   . . . . . Van Biesbroeck star  
   . . . . . Mira variables  
   . . . . . Omicron Ceti star  
   . . . . . S stars  
 RT brown dwarf stars  
   giant stars  
   R Coronae Borealis stars  
   stellar atmospheres  
   stellar envelopes  
   stellar spectra  
   stellar temperature
- coolant loss*  
 USE **loss of coolant**
- coolants**  
 DEF Liquids of gases used to cool something, as a rocket combustion chamber.  
 GS **coolants**  
   . engine coolants  
   . organic coolants  
 RT air conditioning  
   air cooling  
   brines
- coolers  
 cooling  
 cooling systems  
 freon  
 gas cooling  
 heat exchangers  
 liquid cooling  
 loss of coolant  
 nuclear reactors  
 reactor materials  
 refrigerants  
 sodium cooling
- coolers**  
 RT air conditioning  
   air conditioning equipment  
   air cooling  
   compressors  
   coolants  
   cooling  
   cooling systems  
   cryogenic cooling  
   refrigerating  
   refrigerating machinery  
   refrigerators
- cooling**  
 UF *chilling*  
   *heat dissipation*  
   *heat dissipation chilling*  
 GS **cooling**  
   . absorption cooling  
   . air cooling  
   . evaporative cooling  
   . . film cooling  
   . . sweat cooling  
   . gas cooling  
   . laser cooling  
   . liquid cooling  
   . . film cooling  
   . magnetic cooling  
   . plasma cooling  
   . precooling  
   . quenching (cooling)  
   . . rapid quenching (metallurgy)  
   . cryogenic cooling  
   . radiant cooling  
   . regenerative cooling  
   . sodium cooling  
   . solar cooling  
   . solid cryogen cooling  
   . space cooling (buildings)  
   . supercooling  
   . surface cooling  
   . thermoelectric cooling  
   . thermomagnetic cooling  
 RT ablation  
   ablative materials  
   air conditioning  
   bathing  
   condensing  
   contraction  
   coolants  
   coolers  
   cooling flows (astrophysics)  
   cryogenics  
   engine coolants  
   film condensation  
   freezing  
   freon  
   geothermal energy utilization  
   heat exchangers  
   heat radiators  
   heat shielding  
   heat transfer  
   heating  
   Hilsch tubes  
   jackets  
   low temperature  
   melting  
   mushy zones  
   refrigerating  
   reusable heat shielding  
   spacecraft radiators  
   temperature control  
   temperature distribution  
   thermal cycling tests  
   thermal shock  
   thermal stresses

## cooling fins

transpiration  
ventilation  
ventilation fans  
venting  
wetting

### cooling fins

GS fins  
. **cooling fins**  
RT condensers (liquefiers)  
convective heat transfer  
finned bodies  
heat exchangers  
heat radiators  
radiative heat transfer

### cooling flows (astrophysics)

GS fluid flow  
. gas flow  
. . **cooling flows (astrophysics)**  
RT accretion disks  
cooling  
cosmic gases  
dark matter  
galactic clusters  
galactic evolution  
intergalactic media  
interstellar gas  
star formation  
x ray sources

### cooling systems

RT absorbers (equipment)  
air conditioning  
air conditioning equipment  
air cooling  
air filters  
blowers  
capillary pumped loops  
closed cycles  
condensers (liquefiers)  
coolants  
coolers  
dehumidification  
engine coolants  
Ettingshausen effect  
evaporative cooling  
evaporators  
exhaust systems  
freon  
heat exchangers  
heat pumps  
heat radiators  
heat sinks  
infrared suppression  
intake systems  
liquid cooling  
lubrication systems  
refrigerants  
refrigerating  
refrigerating machinery  
registers (air circulation)  
solar cooling  
solid cryogenes  
space cooling (buildings)  
spacecraft radiators  
∞ systems  
temperature control  
temperature distribution  
thermoacoustic refrigerators  
transpiration  
ventilation  
ventilation fans  
vents

### ∞ cooperation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT conventions  
employee relations  
international cooperation  
public relations  
sea law

### Cooper-Harper ratings

(added August 1999)  
GS flight characteristics  
. pilot ratings  
. . **Cooper-Harper ratings**

ratings  
. pilot ratings  
. . **Cooper-Harper ratings**  
RT aircraft performance  
helicopter performance

*coordinate geometry language*  
USE **COGO (programming language)**

*coordinate systems*  
USE **coordinates**

### coordinate transformations

GS functions (mathematics)  
. **coordinate transformations**  
transformations (mathematics)  
. **coordinate transformations**  
RT conformal mapping  
invariant imbeddings  
isoparametric finite elements  
isotropic turbulence  
Joukowski transformation  
Schwarzschild metric  
Theodorsen transformation

### coordinates

DEF Sets of measures defining points in space. Used for axes (coordinates) and coordinate systems.

UF *axes (coordinates)*  
*coordinate systems*

GS **coordinates**  
. astronomical coordinates  
. Cartesian coordinates  
. computational grids  
. . structured grids (mathematics)  
. . . multiblock grids  
. . unstructured grids (mathematics)  
. cylindrical coordinates  
. geodetic coordinates  
. Hylleraas coordinates  
. hyperbolic coordinates  
. inertial coordinates  
. Lagrange coordinates  
. oblique coordinates  
. planetocentric coordinates  
. . geocentric coordinates  
. polar coordinates  
. spherical coordinates

RT algebra  
analytic geometry  
axes (reference lines)  
celestial reference systems  
Earth axis  
equators  
Euclidean geometry  
fractals  
Fujita method  
geomagnetic latitude  
geometry  
grid generation (mathematics)  
∞ grids  
half planes  
half spaces  
latitude  
line of sight  
longitude  
manifolds (mathematics)  
maps  
∞ nets  
∞ origins  
position (location)  
∞ reference systems

### coordination

RT continuity  
correlation  
interfaces  
sequencing  
time sharing

### coordination number

(added June 2002)  
DEF In any system with a lattice structure, the number of neighboring units for any given unit.

RT crystal lattices  
crystal structure  
ligands  
molecular structure

∞ numbers  
x ray spectroscopy

### coordination polymers

RT ∞ polymers

*Copernicus spacecraft*

USE **OA0 3**

*copilots*

USE **aircraft pilots**

### coplanarity

GS analysis (mathematics)  
. calculus  
. . vector analysis  
. . . **coplanarity**  
. real variables  
. . vector analysis  
. . . **coplanarity**  
geometry  
. vector analysis  
. . **coplanarity**

### copolymerization

GS chemical reactions  
. **copolymerization**  
synthesis (chemistry)  
. polymerization  
. . **copolymerization**  
RT block copolymers  
dimerization  
∞ polymers  
vinyl copolymers

### copolymers

DEF Polymers formed from two or more types of monomers.

GS **copolymers**  
. block copolymers  
. vinyl copolymers  
. Viton rubber (trademark)  
RT KEL-F  
polymer blends  
∞ polymers

### copper

GS chemical elements  
. **copper**  
. . copper isotopes  
metals  
. transition metals  
. . **copper**  
. . . copper isotopes  
RT amines  
constantan  
heavy metals  
selenium alloys

### copper alloys

GS alloys  
. **copper alloys**  
. . babbitt metal  
. . brasses  
. . bronzes  
. . Manganin (trademark)  
RT aluminum-lithium alloys  
bearing alloys  
gold alloys  
lamella (metallurgy)  
lithium alloys

### copper chlorides

GS copper compounds  
. **copper chlorides**  
halogen compounds  
. chlorine compounds  
. . chlorides  
. . . **copper chlorides**  
. halides  
. . chlorides  
. . . **copper chlorides**  
. . metal halides  
. . . **copper chlorides**

### copper compounds

GS **copper compounds**  
. copper chlorides  
. copper fluorides  
. copper oxides

- . copper selenides
  - . . copper indium selenides
  - . copper sulfides
  - . cuprates
  - RT ∞ chemical compounds
  - ∞ Group 1B compounds
  - ∞ metal compounds
- copper fluorides**
- GS copper compounds
  - . **copper fluorides**
  - halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . metal fluorides
  - . . . . **copper fluorides**
  - . halides
  - . . fluorides
  - . . . metal fluorides
  - . . . . **copper fluorides**
  - . metal halides
  - . . metal fluorides
  - . . . . **copper fluorides**
- copper indium selenides**  
(added June 1995)
- GS chalcogenides
  - . selenides
  - . . copper selenides
  - . . . **copper indium selenides**
  - . . indium selenides
  - . . . . **copper indium selenides**
  - copper compounds
  - . copper selenides
  - . . **copper indium selenides**
  - indium compounds
  - . indium selenides
  - . . **copper indium selenides**
  - selenium compounds
  - . selenides
  - . . copper selenides
  - . . . **copper indium selenides**
  - . . indium selenides
  - . . . . **copper indium selenides**
  - RT semiconductors (materials)
  - solar cells
  - thin films
- copper isotopes**
- GS chemical elements
  - . copper
  - . . **copper isotopes**
  - . nuclides
  - . . isotopes
  - . . . radioactive isotopes
  - . . . . **copper isotopes**
  - metals
  - . transition metals
  - . . copper
  - . . . **copper isotopes**
- copper oxides**
- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **copper oxides**
  - copper compounds
  - . **copper oxides**
  - RT BSCCO superconductors
  - cuprates
  - thermites
  - YBCO superconductors
- copper selenides**
- GS chalcogenides
  - . selenides
  - . . **copper selenides**
  - . . . copper indium selenides
  - copper compounds
  - . **copper selenides**
  - . . copper indium selenides
  - selenium compounds
  - . selenides
  - . . **copper selenides**
  - . . . copper indium selenides
- copper sulfides**
- GS chalcogenides
  - . sulfides
  - . . inorganic sulfides
- . . . **copper sulfides**
  - copper compounds
  - . **copper sulfides**
  - sulfur compounds
  - . sulfides
  - . . inorganic sulfides
  - . . . **copper sulfides**
- copyrights**
- GS intellectual property
  - . **copyrights**
  - RT documents
  - licensing
  - patent applications
  - policies
  - regulations
- coral heads*
- USE **coral reefs**
- coral reefs**
- UF *atoll reefs*
  - coral heads*
  - RT atolls
  - coasts
  - islands
  - keys (islands)
  - reefs
- cordage**
- RT cables (ropes)
  - ceramic fibers
  - connectors
  - cotton
  - fibers
  - ∞ filaments
  - strands
  - strings
  - wire
  - yarns
- Cordelia**  
(added January 1996)
- DEF A natural satellite of Uranus orbiting at a mean distance of 49,750 kilometers.
  - GS celestial bodies
  - . natural satellites
  - . . Uranus satellites
  - . . . **Cordelia**
  - RT Uranus (planet)
- cordierite**
- GS aluminum compounds
  - . **cordierite**
  - iron compounds
  - . **cordierite**
  - magnesium compounds
  - . **cordierite**
  - minerals
  - . **cordierite**
  - silicon compounds
  - . silicates
  - . . **cordierite**
- cordite*
- USE **colloidal propellants**
  - double base propellants**
- core flow**
- GS fluid flow
  - . **core flow**
  - RT flow geometry
  - magnetohydrodynamic flow
  - one dimensional flow
  - plasmas (physics)
  - shear flow
- core sampling**
- GS sampling
  - . **core sampling**
  - RT cores
  - depth measurement
  - drilling
  - Earth crust
  - hydrogeology
  - mines (excavations)
  - ocean bottom
  - ocean currents
  - oceanography
  - particle tracks
- salinity
  - samplers
- core storage**
- UF *machine storage*
  - GS computer components
  - . computer storage devices
  - . . random access memory
  - . . . **core storage**
  - magnetic storage
  - . **core storage**
  - memory (computers)
  - . random access memory
  - . . **core storage**
  - RT bubble memory devices
  - buffer storage
  - data storage
  - magnetic disks
  - magnetic drums
  - ∞ storage
- core-mantle boundary**  
(added August 1994)
- GS boundaries
  - . **core-mantle boundary**
  - RT boundary layers
  - Earth core
  - Earth mantle
  - lunar mantle
  - planetary boundary layer
  - planetary cores
  - planetary mantles
  - regolith
  - tectonics
- cores**
- GS **cores**
  - . honeycomb cores
  - . lunar core
  - . magnetic cores
  - . planetary cores
  - . . Earth core
  - . . reactor cores
  - . stellar cores
  - RT ∞ cells
  - core sampling
  - mandrels
  - molding materials
- Coriolis effect**
- DEF The physiological effect felt by a person moving radially in a rotating system, as a rotating space station resulting in nausea vertigo, dizziness, etc. Named after Gaspard G. Coriolis (d 1843), French civil engineer.
  - RT disorientation
  - ∞ effects
  - gyres
  - Kelvin waves
  - meteorology
  - planetary waves
  - rotating environments
  - rotation
  - vestibular tests
- cork (materials)**
- GS wood
  - . **cork (materials)**
  - RT ∞ materials
  - organic materials
  - thermal insulation
- corn**
- UF *zea mays*
  - GS farm crops
  - . grains (food)
  - . . **corn**
  - plants (botany)
  - . **corn**
  - RT agriculture
  - blight
  - bollworms
  - botany
  - crop growth
  - ∞ crops
  - curing
  - Earth resources
  - ∞ food
  - irrigation



## cornea

seeds

**cornea**  
GS anatomy  
. sense organs  
. eye (anatomy)  
. . . **cornea**  
RT keratitis  
vision

**corner flow**  
GS fluid flow  
. **corner flow**  
RT cavity flow  
channel flow  
ducted flow  
 $\infty$  flow  
nozzle flow  
secondary flow

**corners**  
RT angles (geometry)  
antennas  
joints (junctions)  
shapes

**Corona Borealis constellation**  
GS constellations  
. **Corona Borealis constellation**  
RT celestial bodies  
celestial sphere  
stars

*corona discharges*  
USE **electric corona**

**coronagraphs**  
RT astronomical photography  
solar observatories  
spectroheliographs  
Starsat telescope  
telescopes

**coronal holes**  
DEF Solar areas where extreme UV and x ray coronal emission is abnormally low or absent. These are coronal regions apparently associated with diverging magnetic fields.  
GS coronas  
. stellar coronas  
. . . solar corona  
. . . **coronal holes**  
RT decametric waves  
 $\infty$  holes  
radio astronomy  
solar radio emission  
solar wind  
solar x-rays  
stellar structure  
ultraviolet radiation

**coronal loops**  
DEF Loop like structures revealed in soft x ray images of the solar limb and believed to evolve from the introduction of energy and density perturbations at the top of an arched, cylindrical magnetic flux tube initially in equilibrium in the coronal plasma.  
GS coronas  
. stellar coronas  
. . . solar corona  
. . . **coronal loops**  
RT chromosphere  
coronal mass ejection  
solar flares  
solar limb

**coronal mass ejection**  
(added June 1997)  
GS ejection  
. stellar mass ejection  
. . . **coronal mass ejection**  
RT coronal loops  
interplanetary shock waves  
solar corona  
solar flares  
solar wind  
stellar coronas

STEREO (observatory)

**coronary artery disease**  
GS diseases  
. heart diseases  
. . . **coronary artery disease**  
RT angina pectoris  
arteriosclerosis  
myocardial infarction

**coronary circulation**  
GS circulation  
. blood circulation  
. . . **coronary circulation**  
RT heart  
heart valves

**coronas**  
GS **coronas**  
. electric corona  
. stellar coronas  
. . . solar corona  
. . . coronal holes  
. . . coronal loops  
RT electric arcs  
electric discharges  
halos  
ionization  
solar spectra

**corotation**  
GS gyration  
. rotation  
. . . **corotation**  
RT astronomical models  
Earth magnetosphere  
galactic rotation  
galactic structure  
spiral galaxies  
stellar motions  
stellar rotation

**Corporal missile**  
GS missiles  
. surface to surface missiles  
. . . **Corporal missile**  
RT liquid propellant rocket engines

*corpuscles (blood)*  
USE **blood cells**

**corpuscular radiation**  
SN (LIMITED TO NONELECTROMAGNETIC RADIATION CONSISTING OF ENERGETIC CHARGED OR NEUTRAL PARTICLES)  
DEF Nonelectromagnetic radiation consisting of energetic charged or neutral particles.  
Used for penetrating particles.  
UF *penetrating particles*  
GS particles

. **corpuscular radiation**  
. . electron precipitation  
. . electron radiation  
. . . beta particles  
. . . electron beams  
. . . relativistic electron beams  
. . energetic particles  
. . . electrons  
. . . . conduction electrons  
. . . . free electrons  
. . . . high energy electrons  
. . . . . relativistic electron beams  
. . . . hot electrons  
. . . . N electrons  
. . . . negatrons  
. . . . photoelectrons  
. . . . pi-electrons  
. . . . polarons  
. . . . solar electrons  
. . . nuclei (nuclear physics)  
. . . . alpha particles  
. . . . deuterons  
. . . . even-even nuclei  
. . . . heavy nuclei  
. . . . hypernuclei  
. . . . odd-even nuclei  
. . . . odd-odd nuclei  
. . . . tritons  
. . . plasmas (physics)  
. . . . argon plasma  
. . . . beta particles

. . . . boundary layer plasmas  
. . . . cold plasmas  
. . . . collisional plasmas  
. . . . . strongly coupled plasmas  
. . . . collisionless plasmas  
. . . . cosmic plasma  
. . . . cylindrical plasmas  
. . . . dense plasmas  
. . . . . plasma focus  
. . . . . strongly coupled plasmas  
. . . . electron plasma  
. . . . electron-positron plasmas  
. . . . elliptical plasmas  
. . . . helium plasma  
. . . . high temperature plasmas  
. . . . hydrogen plasma  
. . . . . deuterium plasma  
. . . . laser plasmas  
. . . . metallic plasmas  
. . . . . cesium plasma  
. . . . . uranium plasmas  
. . . . microplasmas  
. . . . nitrogen plasma  
. . . . nonequilibrium plasmas  
. . . . nonuniform plasmas  
. . . . oxygen plasma  
. . . . rarefied plasmas  
. . . . relativistic plasmas  
. . . . rotating plasmas  
. . . . semiconductor plasmas  
. . . . space plasmas  
. . . . . solar wind  
. . . . . stellar winds  
. . . . . dusty plasmas  
. . . . spherical plasmas  
. . . . thermal plasmas  
. . . . toroidal plasmas  
. . . primary cosmic rays  
. . . solar cosmic rays  
. . . radiation belts  
. . . artificial radiation belts  
. . . inner radiation belt  
. . . outer radiation belt  
. . . proton belts  
. . . solar corpuscular radiation  
. . . solar electrons  
. . . solar neutrinos  
. . . solar neutrons  
. . . solar protons  
RT alpha particles  
atmospheric radiation  
background radiation  
beams (radiation)  
Cerenkov radiation  
charged particles  
coherent radiation  
continuous radiation  
cosmic rays  
electromagnetic radiation  
extraterrestrial radiation  
flux (rate)  
galactic radiation  
incident radiation  
interstellar radiation  
ionizing radiation  
ions  
mesons  
neutrons  
nuclear particles  
nuclear radiation  
nuclei (nuclear physics)  
particle production  
phonon beams  
pulsed radiation  
 $\infty$  radiation  
radiation distribution  
radiation pressure  
radiation sources  
 $\infty$  rays  
reflected waves  
refracted waves  
solar radiation  
solar terrestrial interactions  
stratosphere radiation

**correction**  
DEF A quantity, equal in absolute magnitude to the error, added to a calculated or observed value to obtain a true value.  
GS **correction**

. atmospheric correction  
 . optical correction procedure  
 RT accommodation  
 accuracy  
 adaptation  
 adjusting  
 alignment  
 error correcting devices  
 errors  
 improvement  
 information theory  
 intercalibration  
 parity  
 redundancy  
 revisions  
 vegetative index

**correlation**

DEF In statistics, a relationship between two occurrences which is expressed as a number between minus one (-1) and plus one (+1). Used for correlation functions.

UF *correlation functions*

GS **correlation**

. angular correlation  
 . autocorrelation  
 . correlation coefficients  
 . correlation detection  
 . cross correlation  
 . data correlation  
 . spectral correlation  
 . statistical correlation

RT bivariate analysis  
 collating  
 confidence  
 contingency  
 coordination  
 covariance  
 ∞ estimators  
 evaluation  
 factor analysis  
 forecasting  
 information theory  
 least squares method  
 multivariate statistical analysis  
 optimization  
 probability theory  
 quality control  
 regression analysis  
 regression coefficients  
 significance  
 statistical analysis  
 teleconnections (meteorology)  
 time series analysis  
 validity  
 variability  
 variance (statistics)

**correlation coefficients**

GS coefficients  
 . **correlation coefficients**  
 correlation  
 . **correlation coefficients**  
 statistical analysis  
 . **correlation coefficients**

RT quality control  
 statistical correlation

**correlation detection**

DEF A method of detection in which a signal is compared, point-to-point, with an internally generated reference.

GS correlation  
 . **correlation detection**  
 detection  
 . signal detection  
 . . **correlation detection**

RT ∞ detectors  
 electromagnetic wave filters  
 phase lock demodulators  
 signal to noise ratios

*correlation functions*

USE **correlation**

**correlators**

SN (LIMITED TO DEVICES THAT DETECT WEAK SIGNALS IN NOISE BY PERFORMING AN ELECTRONIC OPERATION)

DEF Devices that detect weak signals in

noise by performing an electronic operation.

Used for synchronous detectors.

UF *synchronous detectors*

GS **correlators**

. image correlators

. optical correlators

RT synchrosopes

**corridors**GS **corridors**

. Great Plains Corridor (North America)

. St Louis-Kansas City Corridor (MO)

RT passageways

**corrosion**

DEF The deterioration of a metal by chemical or electrochemical reaction with its environment. Used for metal corrosion.

UF *metal corrosion*

GS **corrosion**

. cavitation corrosion  
 . electrochemical corrosion  
 . fretting corrosion  
 . fuel corrosion  
 . hot corrosion  
 . intergranular corrosion  
 . rusting  
 . scale (corrosion)  
 . stress corrosion  
 . . stress corrosion cracking  
 . transgranular corrosion

RT chemical attack  
 chemical reactions  
 coatings  
 damage  
 degradation  
 deposits  
 deterioration  
 dissolving  
 durability  
 electrochemistry  
 electrolysis  
 erosion  
 etchants  
 etching  
 failure  
 finishes  
 fouling  
 gas-metal interactions  
 humidity  
 impingement  
 incompatibility  
 metal coatings  
 ∞ metallurgy  
 metal-water reactions  
 oxidation  
 passivity  
 pitting  
 protective coatings  
 salt spray tests  
 sterilization effects  
 surface properties  
 tribology  
 wear  
 weathering

**corrosion prevention**

GS prevention  
 . **corrosion prevention**  
 protection  
 . **corrosion prevention**

RT aeration  
 antifouling  
 antioxidants  
 cavitation corrosion  
 chemical attack  
 cleaning  
 coating  
 coatings  
 desensitizing  
 ∞ films

. fuel tanks

∞ inhibition

inhibitors

metal coatings

nickel coatings

packaging

passivity

preserving

propellant additives  
 sensitizing  
 siliconizing  
 surface finishing  
 surface treatment  
 water treatment  
 weatherproofing

**corrosion resistance**GS **corrosion resistance**

. oxidation resistance

RT antioxidants

cavitation corrosion

chemical attack

chemical tests

passivity

pitting

∞ resistance

rusting

salt spray tests

siliconizing

sulfidation

surface finishing

**corrosion test loops**

GS environmental tests

. corrosion tests

. . **corrosion test loops**

loops

. **corrosion test loops**

RT ∞ tests

**corrosion tests**

GS environmental tests

. **corrosion tests**

. . corrosion test loops

. . salt spray tests

RT cavitation corrosion

chemical attack

destructive tests

fuel tests

∞ materials tests

pitting

propellant tests

stability tests

stress corrosion cracking

∞ tests

transgranular corrosion

underwater tests

weathering

**corrugated plates**

GS structural members

. plates (structural members)

. . **corrugated plates**

RT corrugating

reinforced plates

**corrugated shells**

GS shells (structural forms)

. **corrugated shells**

RT anisotropic shells

corrugating

reinforced shells

**corrugated waveguides**

(added February 1998)

GS waveguides

. **corrugated waveguides**

RT gratings (spectra)

optical waveguides

waveguide antennas

**corrugating**

RT corrugated plates

corrugated shells

deformation

grooves

∞ plates

∞ ridges

∞ waves

*Corsair aircraft*

USE **A-7 aircraft**

∞ **cortexes**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT cerebral cortex

## cortexes (botany)

cortexes (botany)

**cortexes (botany)**  
RT  $\infty$  cortexes  
plants (botany)

**Corti organ**  
GS anatomy  
. . . . . ear  
. . . . . labyrinth  
. . . . . cochlea  
. . . . . **Corti organ**

**corticosteroids**  
GS organic compounds  
. . . . . lipids  
. . . . . steroids  
. . . . . **corticosteroids**  
. . . . . aldosterone  
. . . . . hydroxycorticosteroid  
. . . . . cortisone  
. . . . . glucocorticoids  
secretions  
. . . . . endocrine secretions  
. . . . . hormones  
. . . . . **corticosteroids**  
. . . . . aldosterone  
. . . . . hydroxycorticosteroid  
. . . . . cortisone  
. . . . . glucocorticoids  
RT adrenal metabolism

**cortisone**  
GS drugs  
. . . . . **cortisone**  
organic compounds  
. . . . . lipids  
. . . . . steroids  
. . . . . corticosteroids  
. . . . . hydroxycorticosteroid  
. . . . . **cortisone**  
secretions  
. . . . . endocrine secretions  
. . . . . hormones  
. . . . . corticosteroids  
. . . . . hydroxycorticosteroid  
. . . . . **cortisone**  
RT adrenal metabolism  
carbohydrate metabolism

*corundum*  
USE **aluminum oxides**

**Corvus missile**  
GS missiles  
. . . . . **Corvus missile**  
RT liquid propellant rocket engines

**COS-B satellite**  
GS artificial satellites  
. . . . . ESA satellites  
. . . . . **COS-B satellite**  
ESA spacecraft  
. . . . . ESA satellites  
. . . . . **COS-B satellite**  
RT Europa 2 launch vehicle  
European space programs  
gamma ray sources (astronomy)

**cosine series**  
GS analysis (mathematics)  
. . . . . calculus  
. . . . . series (mathematics)  
. . . . . **cosine series**  
. . . . . real variables  
. . . . . differential equations  
. . . . . **cosine series**  
. . . . . periodic functions  
. . . . . trigonometric functions  
. . . . . **cosine series**  
. . . . . series (mathematics)  
. . . . . **cosine series**  
functions (mathematics)  
. . . . . transcendental functions  
. . . . . periodic functions  
. . . . . trigonometric functions  
. . . . . **cosine series**

RT wavelet analysis

**Cosmic Background Explorer satellite**  
DEF A NASA satellite launched on November 18, 1989 on a Delta I expendable launch vehicle. It is designed to measure background radiation in order to confirm or deny the big bang theory. Used for COBE.  
UF **COBE**  
GS artificial satellites  
. . . . . scientific satellites  
. . . . . Explorer satellites  
. . . . . **Cosmic Background Explorer satellite**  
RT background radiation  
radiation spectra  
spaceborne astronomy

**cosmic dust**  
DEF Finely divided solid matter with particle sizes smaller than a micrometeorite, thus with diameters much smaller than a millimeter, moving in interplanetary space.  
GS extraterrestrial matter  
. . . . . interstellar matter  
. . . . . **cosmic dust**  
. . . . . interplanetary dust  
. . . . . meteoroid dust clouds  
. . . . . zodiacal dust  
particles  
. . . . . dust  
. . . . . **cosmic dust**  
. . . . . interplanetary dust  
. . . . . meteoroid dust clouds  
. . . . . zodiacal dust  
RT infrared cirrus (astronomy)  
intergalactic media  
meteoroids  
micrometeorites  
micrometeoroids  
molecular clouds  
organic solids  
polycyclic aromatic hydrocarbons  
reflection nebulae  
space debris  
terrestrial dust belt  
Venus fly trap rocket vehicle

*cosmic gamma ray bursts*  
USE **gamma ray bursts**

**cosmic gases**  
GS extraterrestrial matter  
. . . . . **cosmic gases**  
. . . . . interplanetary gas  
. . . . . interstellar gas  
gases  
. . . . . rarefied gases  
. . . . . **cosmic gases**  
. . . . . interplanetary gas  
. . . . . interstellar gas  
RT cooling flows (astrophysics)  
degenerate matter  
electron gas  
intergalactic media  
ionized gases  
neutral gases  
Sunyaev-Zeldovich effect

**cosmic microwave background radiation**  
(added July 2000)  
UF **CMBR (astronomy)**  
GS background radiation  
. . . . . **cosmic microwave background radiation**  
electromagnetic radiation  
. . . . . radio waves  
. . . . . extraterrestrial radio waves  
. . . . . **cosmic microwave background radiation**  
. . . . . short wave radiation  
. . . . . microwaves  
. . . . . **cosmic microwave background radiation**  
extraterrestrial radiation  
. . . . . extraterrestrial radio waves  
. . . . . **cosmic microwave background radiation**  
RT cosmology  
Microwave Anisotropy Probe

radio astronomy  
relic radiation  
Sunyaev-Zeldovich effect

**cosmic noise**  
DEF Interference caused by cosmic radio waves.  
GS electromagnetic interference  
. . . . . radio frequency interference  
. . . . . electromagnetic noise  
. . . . . **cosmic noise**  
RT Alouette project  
background noise  
background radiation  
centimeter waves  
electromagnetic noise measurement  
galactic radiation  
galactic radio waves  
interstellar radiation  
microwave emission  
microwaves  
noise storms  
solar radiation  
solar radio emission

**cosmic plasma**  
GS extraterrestrial matter  
. . . . . **cosmic plasma**  
particles  
. . . . . charged particles  
. . . . . energetic particles  
. . . . . plasmas (physics)  
. . . . . **cosmic plasma**  
. . . . . corpuscular radiation  
. . . . . energetic particles  
. . . . . plasmas (physics)  
. . . . . **cosmic plasma**  
RT intergalactic media  
interplanetary gas  
plasma clouds  
plasmopause  
relativistic plasmas  
solar wind  
stellar winds  
strongly coupled plasmas

*cosmic radiation*  
USE **cosmic rays**

*cosmic radio waves*  
USE **extraterrestrial radio waves**

**cosmic ray albedo**  
GS albedo  
. . . . . **cosmic ray albedo**  
RT absorptance  
 $\infty$  absorption  
atmospheric attenuation  
Earth albedo  
lunar albedo  
primary cosmic rays  
reflectance  
secondary cosmic rays

**cosmic ray showers**  
UF *air showers*  
*Auger showers*  
*Moliere formula*  
GS ionizing radiation  
. . . . . cosmic rays  
. . . . . **cosmic ray showers**  
RT Auger effect  
 $\infty$  cascades  
electron photon cascades  
secondary cosmic rays  
 $\infty$  showers

**cosmic rays**  
DEF The aggregate of extremely high energy subatomic particles which travel the solar system and bombard the earth from all directions. Cosmic ray primaries seem to be mostly protons, hydrogen nuclei, but also contain heavier nuclei. On colliding with atmospheric particles they produce many different kinds of lower energy secondary cosmic radiation. Used for cosmic radiation.  
UF *cosmic radiation*  
GS ionizing radiation  
. . . . . **cosmic rays**

- . . cosmic ray showers
- . . galactic cosmic rays
- . . gamma ray bursts
- . . primary cosmic rays
- . . . solar cosmic rays
- . . secondary cosmic rays
- RT aerospace environments
- albedo
- Alpha Magnetic Spectrometer
- alpha particles
- big bang cosmology
- Cerenkov radiation
- corpuscular radiation
- deuterons
- electromagnetic radiation
- electron acceleration
- electrons
- extraterrestrial radiation
- Fermi Gamma-ray Space Telescope
- Forbush decreases
- galactic radiation
- gamma ray telescopes
- gamma rays
- heliosphere
- interstellar radiation
- ion density (concentration)
- mesons
- neutrons
- nuclear particles
- nuclei (nuclear physics)
- particle tracks
- photons
- protons
- ∞ radiation
- radiation belts
- radiative transfer
- scintillating fibers
- single event upsets
- solar radiation
- stellar radiation
- VLF emission recorders
- x rays

**cosmic x rays**

- GS electromagnetic radiation
- . x rays
- . . **cosmic x rays**
- ionizing radiation
- . x rays
- . . **cosmic x rays**
- RT extraterrestrial radiation
- galactic radiation
- gamma ray astronomy
- gamma ray bursts
- gamma rays
- x ray astronomy
- x ray binaries
- x ray sources

*cosmions*  
 (added November 1999)  
 USE **weakly interacting massive particles**

**cosmochemistry**  
 DEF The branch of chemistry that deals with the chemical composition and changes in the universe.  
 RT ∞ chemistry  
 cosmology  
 extraterrestrial matter  
 geochemistry  
 interstellar chemistry  
 isotope ratios  
 laboratory astrophysics  
 meteoritic composition

*cosmogony*  
 USE **cosmology**

**cosmology**

- UF *cosmogony*
- GS **cosmology**
- . big bang cosmology
- . Hubble diagram
- . missing mass (astrophysics)
- RT astronomical models
- astrophysics
- cosmic microwave background radiation

- cosmochemistry
- dark energy
- dark matter
- event horizon
- existence
- galactic evolution
- grand unified theory
- gravitinos
- Hubble constant
- large-scale structure of the universe
- local group (astronomy)
- mass distribution
- naked singularities
- nuclear astrophysics
- planetary evolution
- Population III stars
- protoplanets
- red shift
- star distribution
- star formation
- stellar evolution
- stellar mass accretion
- string theory
- supergravity
- supersymmetry
- Tully-Fisher relation
- universe
- white holes (astronomy)

**cosmonauts**

- GS personnel
- . flying personnel
- . . **cosmonauts**
- RT ∞ astronautics
- astronauts
- crew experiment stations
- crew observation stations
- crew workstations
- crews
- pilots (personnel)
- Russian Space Program
- spacecrews

∞ **cosmos**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Cosmos satellites
- universe

**Cosmos 2 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 2 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 2 satellite**

**Cosmos 3 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 3 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 3 satellite**

**Cosmos 5 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 5 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 5 satellite**

**Cosmos 6 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 6 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 6 satellite**

**Cosmos 14 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 14 satellite**

- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 14 satellite**

**Cosmos 44 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 44 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 44 satellite**

**Cosmos 54 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 54 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 54 satellite**

**Cosmos 71 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 71 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 71 satellite**

**Cosmos 110 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 110 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 110 satellite**

**Cosmos 137 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 137 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 137 satellite**

**Cosmos 144 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 144 satellite**
- . meteorological satellites
- . . **Cosmos 144 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 144 satellite**

**Cosmos 149 satellite**

- UF *Space Arrow satellite*
- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 149 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 149 satellite**

**Cosmos 166 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 166 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 166 satellite**

**Cosmos 186 satellite**

- GS artificial satellites
- . geophysical satellites
- . . Cosmos satellites
- . . . **Cosmos 186 satellite**
- . Soviet satellites
- . . Cosmos satellites
- . . . **Cosmos 186 satellite**

**Cosmos 188 satellite**

- GS artificial satellites

## Cosmos 206 satellite

- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 188 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 188 satellite**

### Cosmos 206 satellite

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 206 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 206 satellite**

### Cosmos 213 satellite

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 213 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 213 satellite**

### Cosmos 224 satellite

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 224 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 224 satellite**

### Cosmos 225 satellite

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 225 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 225 satellite**

### Cosmos 381 satellite

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 381 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 381 satellite**

### Cosmos 782 satellite

DEF One in a series of satellites launched by the USSR reportedly for geophysical observations.

- GS artificial satellites
- . Soviet satellites
- .. **Cosmos 782 satellite**

RT international cooperation

### Cosmos 936 satellite

DEF One in a series of satellites launched by the USSR reportedly for geophysical observations.

- GS artificial satellites
- . Soviet satellites
- .. **Cosmos 936 satellite**

RT international cooperation

### Cosmos 954 satellite

DEF A Russian ocean surveillance satellite which reentered over Canada spreading radioactive debris.

- GS artificial satellites
- . geophysical satellites
- .. Cosmos satellites
- ... **Cosmos 954 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 954 satellite**

RT uncontrolled reentry (spacecraft)

### Cosmos 1129 satellite

DEF Soviet VOSTOK biological spacecraft launched on September 25, 1979 carrying experiments from several nations. NASA contributed 13 experiments.

- GS artificial satellites
- . geophysical satellites

- .. Cosmos satellites
- ... **Cosmos 1129 satellite**
- . Soviet satellites
- .. Cosmos satellites
- ... **Cosmos 1129 satellite**

RT international cooperation

### Cosmos satellites

- GS artificial satellites
- . geophysical satellites
- .. **Cosmos satellites**
- ... Cosmos 2 satellite
- ... Cosmos 3 satellite
- ... Cosmos 5 satellite
- ... Cosmos 6 satellite
- ... Cosmos 14 satellite
- ... Cosmos 44 satellite
- ... Cosmos 54 satellite
- ... Cosmos 71 satellite
- ... Cosmos 110 satellite
- ... Cosmos 137 satellite
- ... Cosmos 144 satellite
- ... Cosmos 149 satellite
- ... Cosmos 166 satellite
- ... Cosmos 186 satellite
- ... Cosmos 188 satellite
- ... Cosmos 206 satellite
- ... Cosmos 213 satellite
- ... Cosmos 224 satellite
- ... Cosmos 225 satellite
- ... Cosmos 381 satellite
- ... Cosmos 954 satellite
- ... Cosmos 1129 satellite
- ... Intercosmos satellites
- . Soviet satellites
- .. **Cosmos satellites**
- ... Cosmos 2 satellite
- ... Cosmos 3 satellite
- ... Cosmos 5 satellite
- ... Cosmos 6 satellite
- ... Cosmos 14 satellite
- ... Cosmos 44 satellite
- ... Cosmos 54 satellite
- ... Cosmos 71 satellite
- ... Cosmos 110 satellite
- ... Cosmos 137 satellite
- ... Cosmos 144 satellite
- ... Cosmos 149 satellite
- ... Cosmos 166 satellite
- ... Cosmos 186 satellite
- ... Cosmos 188 satellite
- ... Cosmos 206 satellite
- ... Cosmos 213 satellite
- ... Cosmos 224 satellite
- ... Cosmos 225 satellite
- ... Cosmos 381 satellite
- ... Cosmos 954 satellite
- ... Cosmos 1129 satellite
- ... Intercosmos satellites

RT ∞ cosmos

### COSPAR (committee)

USE **Committee on Space Research**

### COSPAS

DEF The USSR satellite of the COSPAS-SarSat project which is a satellite-aided project for the search and rescue of distressed vehicles, administered by USSR, US, French, and Canadian agencies.

- GS artificial satellites
- .. **COSPAS**
- RT reconnaissance
- rescue operations
- SarSat
- searching

### Cosserat surfaces

- RT flat surfaces
- ∞ surface geometry
- surface properties
- ∞ surfaces

### cost analysis

- UF *cost benefit analysis*
- RT ∞ analyzing
- budgeting
- comparison
- costs
- design to cost

- economic analysis
- feasibility
- feasibility analysis
- financial management
- life cycle costs
- management
- management analysis
- management planning
- optical transfer function
- production costs
- proposals
- value engineering
- wage surveys

### cost benefit analysis

(added April 2000)

- USE **cost analysis**
- cost effectiveness**

### cost effectiveness

- UF *cost benefit analysis*
- GS effectiveness
- . **cost effectiveness**
- RT allocations
- budgeting
- commercial off-the-shelf products
- life cycle costs

### cost estimates

- GS estimates
- . **cost estimates**
- RT aircraft production costs
- appropriations
- budgeting
- costs
- economic analysis
- economy
- ∞ estimators
- federal budgets
- financial management
- management
- production costs
- value engineering
- wage surveys

### cost incentives

- RT efficiency
- incentive techniques
- management
- value engineering

### cost reduction

- RT commonality
- efficiency
- incentive techniques
- launch costs
- management
- management methods
- management planning
- rapid prototyping
- small satellite technology
- value engineering
- wage surveys

### Costa Rica

- GS nations
- . **Costa Rica**
- RT Central America

### costs

- GS **costs**
- . freight costs
- . launch costs
- . life cycle costs
- . low cost
- . operating costs
- . production costs
- .. aircraft production costs
- RT accounting
- aircraft production
- commerce
- cost analysis
- cost estimates
- damage assessment
- design to cost
- economic analysis
- economic factors
- economic impact
- economics
- efficiency

- estimating  
evaluation  
feasibility  
financial management  
gross national product  
revenue  
task complexity  
tasks  
value
- Cote d'Ivoire**  
(added September 1993)  
UF *Ivory Coast*  
GS nations  
. **Cote d'Ivoire**  
RT Africa
- COTS products*  
(added March 2001)  
USE **commercial off-the-shelf products**
- cotton**  
GS farm crops  
. **cotton**  
plants (botany)  
. **cotton**  
RT boll weevils  
bollworms  
clothing  
cordage  
cotton fibers  
Earth resources  
fabrics  
fibers  
textiles  
yarns
- cotton fibers**  
GS clothing  
. **cotton fibers**  
fibers  
. **cotton fibers**  
textiles  
. **cotton fibers**  
RT cotton  
crepe  
organic materials
- couches**  
RT beds  
cushions  
harnesses  
seats
- Couette flow**  
GS fluid flow  
. steady flow  
. . **Couette flow**  
. 2 dimensional flow  
. . **Couette flow**  
. viscous flow  
. . **Couette flow**  
RT annular flow  
axisymmetric flow  
Brinkman number  
Hartmann flow  
internal flow  
rotating cylinders
- Cougar aircraft*  
USE **F-9 aircraft**
- cough**  
GS reflexes  
. respiratory reflexes  
. . **cough**  
signs and symptoms  
. **cough**  
RT expellants
- coulees*  
USE **canyons**
- Coulomb collisions**  
DEF The collisions of sets of two particles both of which are charged.  
GS collisions  
. **Coulomb collisions**
- RT charged particles
- Coulomb potential**  
GS potential energy  
. electric potential  
. . **Coulomb potential**  
RT charged particles  
coulometry  
electric field strength  
electric fields  
 $\infty$  potential
- coulometers**  
DEF Electrolytic cells or electronic devices arranged to measure the quantity of electricity by the chemical action produced in accordance with Faraday's law.  
GS measuring instruments  
. **coulometers**  
RT ammeters  
chemical analysis  
coulometry  
electrical measurement  
electrochemistry  
electrodeposition  
electrolysis  
titration  
voltmeters
- coulometry**  
GS electrical measurement  
. **coulometry**  
electrochemistry  
. electrolysis  
. . **coulometry**  
RT Coulomb potential  
coulometers
- countdown**  
DEF A step-by-step process that culminates in a climactic event, each step being performed in accordance with a schedule marked by a count in inverse numerical order; specifically, this process is used in leading up to the launch of a large of complicated rocket vehicle, or in leading up to a captive test, a readiness firing, a mock firing or other firing test.  
GS preflight operations  
. **countdown**  
schedules  
. **countdown**  
RT checkout  
crew procedures (preflight)  
launching  
liftoff (launching)  
prelaunch problems  
prelaunch tests  
space vehicle checkout program  
spacecraft launching  
windows (intervals)
- counter rotation**  
DEF Movement of sets of bodies or fluids around a common axis where movement in own rotational direction is opposed by movement in the opposite direction.  
GS gyration  
. rotation  
. . **counter rotation**  
RT boundary value problems  
counterflow  
counter-rotating wheels  
rotating disks  
rotating fluids
- counterbalances**  
RT aircraft stability  
ballast (mass)  
dynamic stability  
mass distribution  
spacecraft stability  
static stability
- counterflow**  
GS fluid flow  
. **counterflow**  
RT axial flow  
counter rotation  
heat exchangers  
heat transfer
- trapped vortices  
turbulent diffusion  
turbulent flow  
vortices
- counterinsurgency aircraft*  
USE **COIN aircraft**
- countermeasures**  
GS **countermeasures**  
. ballistic missile decoys  
. electronic countermeasures  
. . antiradar coatings  
. . chaff  
. jamming  
. optical countermeasures  
. reentry decoys  
. stealth technology  
RT antiradiation missiles  
Blue Goose missile  
decoys  
protection  
quail missile  
radar absorbers  
target masking  
torpedoes
- counter-rotating wheels**  
UF *inertia wheels*  
GS wheels  
. **counter-rotating wheels**  
RT counter rotation  
flywheels  
gears  
mechanical drives  
reaction wheels
- counters**  
UF *dekatrons*  
*gas discharge counters*  
*pulse recorders*  
*quantizer*  
GS measuring instruments  
. **counters**  
. . radiation counters  
. . . Cerenkov counters  
. . . electron counters  
. . . Geiger counters  
. . . neutron counters  
. . . neutron spectrometers  
. . . particle telescopes  
. . . proportional counters  
. . . quantum counters  
. . . scintillation counters  
. . . spark chambers  
RT accumulators (computers)  
computer components  
counting  
counting circuits  
data recorders  
ionization chambers  
monitors  
recording instruments
- countersinking**  
RT grinding (material removal)  
metal cutting
- counting**  
RT counters  
data acquisition  
enumeration  
estimating  
 $\infty$  measurement  
 $\infty$  numbers  
observation  
repetition  
sampling
- counting circuits**  
GS circuits  
. **counting circuits**  
. . scalars  
RT anticoincidence detectors  
counters  
logic circuits
- counting rate computers**  
GS data processing equipment  
. computers

## coupled modes

. . counting rate computers

### coupled modes

DEF Modes of vibration that are not independent, but which influence one mode to the other. Used for mode coupling.

UF *mode coupling*  
GS modes

. **coupled modes**

RT chemical bonds  
couples  
couplings  
crosslinking  
laser arrays  
magnetosphere-ionosphere coupling  
polymerization  
strongly coupled plasmas  
uncoupled modes

### couplers

SN (EXCLUDES MECHANICAL DEVICE)

GS **couplers**  
. antenna couplers  
. . diplexers  
. . directional couplers  
. coupling circuits  
RT antenna components  
coupling  
couplings  
impedance matching  
yokes

### couples

RT antenna couplers  
coupled modes  
coupling circuits  
cross coupling  
diplexers  
optical coupling  
spin-spin coupling  
uncoupled modes  
yokes

### coupling

SN (FOR MECHANICAL DEVICES, USE COUPLINGS)

GS **coupling**  
. acoustic coupling  
. cross coupling  
. electromagnetic coupling  
. . microwave coupling  
. . optical coupling  
. gyroscopic coupling  
. magnetosphere-ionosphere coupling  
. spin-spin coupling  
. thermodynamic coupling  
RT antenna couplers  
Clebsch-Gordan coefficients  
couplers  
couplings  
decoupling  
directional couplers  
linkages  
mechanical drives  
Racah coefficient  
velocity coupling  
wave interaction

### coupling circuits

GS circuits  
. **coupling circuits**  
couplers  
. **coupling circuits**  
RT antenna couplers  
couples  
cross coupling  
energy transfer  
impedance matching  
microwave coupling  
RC circuits  
RL circuits  
transformers

### coupling coefficients

GS coefficients  
. **coupling coefficients**  
RT form factors  
magnetic induction

transfer functions

### couplings

DEF Devices or contrivances for joining adjacent ends or parts of anything. Devices permitting transfer of energy from one electrical circuit to another, or from one mechanical device to another.

RT anchors (fasteners)  
bolts  
clips  
closures  
connectors  
coupled modes  
couplers  
coupling  
directional couplers  
fasteners  
fittings  
∞ joining  
joints (junctions)  
linkages  
mechanical drives  
pins  
rivets  
screws  
sleeves  
splines  
trailers  
unions (connectors)

*Courier aircraft*

USE **U-10 aircraft**

### Courier satellite

GS artificial satellites  
. **Courier satellite**  
RT Advent Project

*courses*

USE **paths**

### covalence

RT chemical bonds  
covalent bonds

### covalent bonds

GS chemical bonds  
. **covalent bonds**  
RT covalence

### covariance

GS statistical analysis  
. variance (statistics)  
. . multivariate statistical analysis  
. . . **covariance**  
RT correlation  
experiment design  
factor analysis  
orthogonality  
quality control  
regression analysis  
significance  
variability

### coveralls

GS clothing  
. **coveralls**  
RT flight clothing  
protective clothing

### coverings

RT camouflage  
∞ caps  
∞ casing  
closures  
coatings  
electrostatic bonding  
enclosures  
∞ envelopes  
guards (shields)  
housings  
jackets  
masking  
netting (materials/structures)  
preserving  
sealing  
shells (structural forms)  
shrouds

spherical caps

*coves*

USE **bays (topographic features)**

*Cowell method*

USE **numerical integration**

### cowlings

GS housings  
. **cowlings**  
RT air intakes  
fairings  
nacelles  
pods (external stores)  
protuberances  
shells (structural forms)

### CP violation

(added April 2002)

DEF Violation of the combined conservation laws associated with charge conjugation (C) and space inversion (P, parity) by the weak nuclear force. A symmetry violation thought to be responsible for the excess of matter over antimatter in the Universe.

GS symmetry  
. broken symmetry

. . **CP violation**

RT conservation laws  
parity  
particle decay  
standard model (particle physics)  
weak interactions (field theory)

*CPL (heat transfer)*

(added September 2003)

USE **capillary pumped loops**

### Crab nebula

GS celestial bodies  
. nebulae  
. . **Crab nebula**  
RT Orion nebula  
supernovae  
Taurus constellation

### crabs

GS animals  
. invertebrates  
. . arthropods  
. . . **crabs**

### crack arrest

RT crack initiation  
crack propagation  
crack tips  
cracking (fracturing)

### crack bridging

(added March 1995)

DEF The occurrence of unbroken material grains or reinforcing elements extending across the surfaces of a crack. A common occurrence in fiber composites and some ceramic materials, it contributes to improved crack growth resistance.

UF *fiber bridging*  
*grain bridging*

RT ceramic matrix composites  
crack opening displacement  
crack propagation  
fiber composites  
fracture mechanics  
metal matrix composites

### crack closure

DEF Phenomenon which occurs when the cyclic plasticity of a material gives rise to the development of residual plastic deformations in the vicinity of a crack tip, causing the fatigue crack to close at positive load.

RT brittleness  
cracking (fracturing)  
cracks  
Elber equation  
fatigue (materials)  
fractography  
fracture mechanics  
fracture strength

fracturing  
Griffith crack  
metal fatigue  
microcracks  
stress corrosion cracking  
surface cracks

*crack formation*

USE **crack initiation**

**crack geometry**

DEF The shape and size of partial fractures or flaws in materials.

GS geometry  
. **crack geometry**  
RT cavities  
crack tips  
cracks  
fatigue (materials)  
fractography  
microcracks  
short cracks  
surface cracks  
voids

**crack initiation**

UF *crack formation*  
RT brittleness  
crack arrest  
crack tips  
cracks  
critical loading  
fracture mechanics  
fracture strength  
J integral  
metal fatigue  
metal surfaces  
microcracks  
short cracks  
stress concentration  
stress corrosion cracking  
stress intensity factors  
surface cracks  
surface defects  
toughness

**crack opening displacement**

(*added September 1988*)  
DEF The displacement at the mouth of a crack in a material. Used for COD (cracks).

UF *COD (cracks)*  
GS displacement  
. **crack opening displacement**  
RT crack bridging  
crack propagation  
cracking (fracturing)  
cracks  
fracture mechanics  
fracture strength  
fractures (materials)  
fracturing  
gaps  
notch tests  
notches  
voids

**crack propagation**

GS propagation (extension)  
. **crack propagation**  
RT acoustic emission  
bend tests  
brittleness  
Coffin-Manson law  
crack arrest  
crack bridging  
crack opening displacement  
crack tips  
cracking (fracturing)  
cracks  
fatigue (materials)  
fractography  
fracture mechanics  
fracture strength  
fracturing  
Griffith crack  
J integral  
metal fatigue  
micromechanics  
plane strain  
 $\infty$  propagation

residual strength  
 $\infty$  resistance  
Segre characteristic  
short cracks  
strain distribution  
stress corrosion cracking  
stress distribution  
stress intensity factors  
surface cracks

**crack tips**

DEF The boundaries between cracked and uncracked material.

GS fractures (materials)  
. cracks  
. . **crack tips**  
tips  
. **crack tips**  
RT crack arrest  
crack geometry  
crack initiation  
crack propagation

**cracking (chemical engineering)**

DEF A process used to reduce the molecular weight of hydrocarbons by breaking molecular bonds by thermal, catalytic, or hydrocracking methods.

GS chemical reactions  
. **cracking (chemical engineering)**  
. . hydrocracking  
. . pyrolysis  
decomposition  
. **cracking (chemical engineering)**  
. . hydrocracking  
. . pyrolysis  
RT ammonolysis  
catalysis  
catalytic activity  
chemical engineering  
coal gasification  
electrolysis  
hydrocarbons  
hydrogenolysis  
hydrolysis  
nitrolysis  
organic chemistry  
photolysis  
thermal dissociation

**cracking (fracturing)**

GS fracturing  
. **cracking (fracturing)**  
. . stress corrosion cracking  
RT brittle materials  
brittleness  
crack arrest  
crack closure  
crack opening displacement  
crack propagation  
cracks  
destruction  
edge cracks  
failure  
fatigue (materials)  
J integral  
kinking  
rupturing  
stress concentration  
stress corrosion  
stress intensity factors  
structural failure  
structural strain  
temperature inversions

**cracks**

UF *crevices*  
GS fractures (materials)  
. **cracks**  
. . crack tips  
. . edge cracks  
. . microcracks  
. . short cracks  
. . surface cracks  
RT cavities  
crack closure  
crack geometry  
crack initiation  
crack opening displacement  
crack propagation

cracking (fracturing)  
defects  
Elber equation  
failure modes  
fatigue (materials)  
interstices  
leakage  
openings  
stresses  
temperature inversions  
ultrasonic spectroscopy

*CRAF mission*

USE **Comet Rendezvous Asteroid Flyby Mission**

*craft*

USE **vehicles**

**Cramer-Rao bounds**

(*added June 1997*)

GS analysis (mathematics)  
. real variables  
. . extremum values  
. . . minima  
. . . . **Cramer-Rao bounds**  
RT Fisher information  
maximum likelihood estimates  
variance (statistics)

**cramps**

RT epilepsy  
muscular function  
seizures

**cranes**

SN (EXCLUDES BIRDS)  
GS handling equipment  
. **cranes**  
. . gantry cranes  
RT booms (equipment)  
conveyors  
 $\infty$  lifts  
logistics  
materials handling  
towers  
winches

**cranium**

GS anatomy  
. head (anatomy)  
. . skull  
. . . **cranium**  
. . . . intracranial cavity  
. . . . musculoskeletal system  
. . . . bones  
. . . . skull  
. . . . . **cranium**  
. . . . . intracranial cavity  
RT intercranial circulation  
mastoids

*cranked wings*

USE **swept wings**

**Crank-Nicholson method**

DEF A method for solving parabolic partial differential equations, whose main feature is an implicit method which avoids the need for using very small time steps.

RT boundary value problems  
differential equations  
finite difference theory  
finite element method  
numerical analysis  
problem solving

*cranks*

USE **eccentrics**

**crash injuries**

GS injuries  
. **crash injuries**  
RT accidents  
burns (injuries)  
hazards  
whiplash injuries

**crash landing**

GS crashes  
. **crash landing**



## crashes

. . ditching (landing)  
RT aircraft accidents  
aircraft hazards  
aircraft safety  
aircraft spin  
arresting gear  
crashworthiness  
emergency landing  
flight hazards  
glide landings  
hard landing  
horizontal spacecraft landing  
lunar landing  
pilot error  
planetary landing  
skid landings  
soft landing  
spacecraft landing  
water landing

**crashes**  
GS **crashes**  
. crash landing  
. ditching (landing)  
RT accidents  
air bag restraint devices  
aircraft accidents  
aircraft hazards  
aircraft safety  
collisions  
crashworthiness  
encounters  
flight hazards  
flight safety  
highways  
midair collisions  
pilot error  
runway incursions  
safety  
wreckage

**crashworthiness**  
DEF The ability of a vehicle to withstand a crash.  
RT aircraft accidents  
aircraft landing  
aircraft safety  
crash landing  
crashes  
flight safety  
impact resistance

**cratering**  
GS **cratering**  
. projectile cratering  
RT craters  
ejecta  
impact damage  
Mars craters  
meteorite craters  
meteoritic damage  
nuclear explosions

**craters**  
UF *maars*  
GS **craters**  
. lunar craters  
. . Ptolemaeus Crater  
. . Tycho crater  
. meteorite craters  
. planetary craters  
. . Mars craters  
RT asteroid collisions  
calderas  
cometary collisions  
cones (volcanoes)  
cratering  
ejecta  
impact damage  
satellite surfaces

**cratons**  
RT continents  
Earth crust  
Earth surface  
ocean bottom

**crawler tractors**  
GS surface vehicles  
. motor vehicles

. . tractors  
. . . **crawler tractors**  
RT electric motor vehicles  
ground support equipment  
handling equipment  
lunar surface vehicles  
manned lunar surface vehicles  
tracked vehicles  
∞ transport vehicles  
∞ vehicles

**Cray computers**  
DEF Supercomputers built by Cray Research Inc. that require the supporting services of another front-end general purpose computer for operation. They incorporate very fast scalar and vector hardware, are used primarily for the simulation of physical phenomena, and are programmed in FORTRAN.  
GS data processing equipment  
. computers  
. . supercomputers  
. . . **Cray computers**

**crayons**  
RT ∞ markers  
temperature measurement

*crazing*  
USE **surface cracks**

**creatine**  
GS crystals  
. **creatine**  
RT juices

**creatinine**  
RT diseases  
urine

*creation*  
USE **creativity**

**creativity**  
UF *creation*  
RT arts  
education  
morale

**creep analysis**  
RT ∞ analyzing  
stress analysis  
stress relaxation  
structural analysis

**creep buckling**  
GS buckling  
. **creep buckling**

**creep diagrams**  
GS diagrams  
. **creep diagrams**  
RT stress relaxation  
stress-strain-time relations

**creep properties**  
GS mechanical properties  
. **creep properties**  
. . creep rupture strength  
. . shear creep  
. . steady state creep  
. . tensile creep  
RT anelasticity  
deformation  
dimensional stability  
ductility  
fatigue (materials)  
∞ flow  
plastic deformation  
plastic flow  
∞ properties  
residual stress  
shear flow  
shear properties  
static deformation  
stress relaxation  
stresses  
structural failure  
superplasticity

temperature inversions

*creep resistance*  
USE **creep strength**

**creep rupture strength**  
UF *stress rupture strength*  
GS mechanical properties  
. creep properties  
. . **creep rupture strength**  
RT fracture strength  
J integral  
∞ strength

**creep strength**  
DEF The constant nominal stress that will cause a specified quantity of creep in a given time at constant temperature. Used for creep resistance.  
UF *creep resistance*  
GS mechanical properties  
. **creep strength**  
RT load carrying capacity  
∞ resistance  
∞ strength

**creep tests**  
RT compression tests  
fatigue tests  
load tests  
plastic deformation  
static tests  
∞ tests

**crepe**  
GS fabrics  
. **crepe**  
RT cotton fibers  
silk

**cresols**  
GS hydroxyl compounds  
. alcohols  
. . phenols  
. . . **cresols**

*crestatrons*  
USE **traveling wave tubes**

*crests*  
USE **waves**

**Cretaceous Period**  
(added June 1989)  
GS Mesozoic Era  
. **Cretaceous Period**  
RT Cretaceous-Tertiary boundary  
geochronology  
paleontology  
Tertiary Period

**Cretaceous-Tertiary boundary**  
(added June 1989)  
UF *K-T boundary*  
RT Cenozoic Era  
cometary collisions  
Cretaceous Period  
extinction  
geochronology  
Mesozoic Era  
paleobiology  
paleontology  
Tertiary Period

**crevasses**  
GS **crevasses**  
. glaciers  
RT Earth movements  
geological faults  
recesses  
seamounts

*crevices*  
USE **cracks**

**Crew Equipment Translation Aid (ISS)**  
(added December 2002)  
DEF A human powered cart used by astronauts to conduct extravehicular-activity (EVA) maintenance on the International Space Station (ISS).

- UF *CETA cart (ISS)*  
 GS carts  
 . **Crew Equipment Translation Aid (ISS)**  
 RT astronaut maneuvering equipment  
 extravehicular activity  
 extravehicular mobility units  
 International Space Station  
 orbital assembly
- crew experiment stations**  
 GS stations  
 . workstations  
 . . crew workstations  
 . . . **crew experiment stations**  
 RT astronauts  
 compartments  
 cosmonauts  
 crews  
 personnel  
 spacecraft cabins  
 spacecrews
- Crew Exploration Vehicle**  
*(added July 2005)*  
 UF *Orion crew vehicle*  
 GS lunar spacecraft  
 . **Crew Exploration Vehicle**  
 manned spacecraft  
 . **Crew Exploration Vehicle**  
 RT Ares 1 launch vehicle  
 Ares 1 upper stage  
 Constellation program  
 long duration space flight  
 lunar exploration  
 manned Mars missions  
 manned space flight  
 Mars exploration
- crew observation stations**  
 GS stations  
 . workstations  
 . . crew workstations  
 . . . **crew observation stations**  
 RT astronauts  
 compartments  
 cosmonauts  
 crews  
 personnel  
 spacecraft cabins  
 spacecrews
- crew procedures (inflight)**  
 DEF Operations performed by crews aboard aircraft or spacecraft during flight. Includes flight operations as well as spaceborne experiment procedures.  
 GS flight operations  
 . **crew procedures (inflight)**  
 procedures  
 . **crew procedures (inflight)**  
 RT display devices  
 flight crews  
 in-flight monitoring  
 spacecrews  
 tasks  
 ∞ tests
- crew procedures (preflight)**  
 DEF Operations performed by crews aboard aircraft or spacecraft and by ground support crews before flight or launching.  
 GS procedures  
 . **crew procedures (preflight)**  
 RT countdown  
 display devices  
 flight crews  
 flight operations  
 ground handling  
 ground tests  
 in-flight monitoring  
 onboard equipment  
 preflight operations  
 prelaunch tests  
 spacecraft control  
 spacecrews  
 tasks
- ∞ tests
- crew size**  
 DEF The number of people in a crew.  
 RT flight crews
- crew stations*  
 USE **crew workstations**
- crew workstations**  
 UF *crew stations*  
 GS stations  
 . workstations  
 . . **crew workstations**  
 . . . crew experiment stations  
 . . . crew observation stations  
 RT astronauts  
 compartments  
 cosmonauts  
 crews  
 helmet mounted displays  
 personnel  
 spacecraft cabins  
 spacecrews
- crews**  
 GS personnel  
 . **crews**  
 . . flight crews  
 . . . spacecrews  
 RT astronauts  
 cosmonauts  
 crew experiment stations  
 crew observation stations  
 crew workstations  
 flight nurses  
 pilots (personnel)
- crickets**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **crickets**
- crime**  
 GS **crime**  
 . air piracy  
 . terrorism  
 RT law (jurisprudence)  
 police  
 regulations  
 security  
 social factors  
 surveillance  
 violence
- crimping*  
 USE **folding**
- criteria**  
 DEF The minimum standards or limits on which judgments may be based.  
 GS **criteria**  
 . structural design criteria  
 RT evaluation  
 figure of merit  
 ∞ measures  
 standards
- critical current**  
*(added December 1999)*  
 DEF A current value in a superconductive material, at a particular constant temperature and in the absence of a magnetic field, below which the material is superconducting and above which the material behaves normally.  
 GS electric current  
 . **critical current**  
 RT critical temperature  
 current density  
 superconductivity  
 superconductors (materials)
- critical experiments**  
 RT experimentation  
 nuclear fission  
 nuclear reactions
- critical flicker fusion**  
 UF *flicker fusion frequency*
- GS perception  
 . sensory perception  
 . . visual perception  
 . . . **critical flicker fusion**  
 RT afterimages  
 flicker
- critical flow**  
 GS fluid flow  
 . **critical flow**  
 RT flow characteristics  
 gas flow  
 laminar flow  
 liquid flow  
 multiphase flow  
 orifice flow  
 pipe flow  
 pressure gradients  
 Ringleb flow  
 single-phase flow  
 steady flow  
 steam flow  
 subcritical flow  
 supercritical flow  
 turbulent flow  
 unsteady flow
- critical frequencies**  
 DEF The limiting frequencies below which magnetoionic wave components are reflected and above which they penetrate through, an ionized medium (plasma) at vertical incidence.  
 GS frequencies  
 . **critical frequencies**  
 RT light (visible radiation)  
 resonant frequencies
- critical loading**  
 SN (LIMITED TO FORCE LOADS)  
 UF *critical stress*  
 GS loads (forces)  
 . **critical loading**  
 stresses  
 . **critical loading**  
 RT aerodynamic loads  
 crack initiation  
 dynamic loads  
 load carrying capacity  
 proportional limit  
 shallow shells  
 static loads
- critical Mach number*  
 USE **critical velocity**  
**Mach number**
- critical mass**  
 DEF The amount of concentrated fissionable material that can just support a self-sustaining fission reaction.  
 GS mass  
 . **critical mass**  
 RT nuclear fission  
 nuclear fuel burnup  
 nuclear reactions  
 plasma core reactors  
 subcritical mass
- critical path method**  
 GS network analysis  
 . **critical path method**  
 RT ∞ control  
 dynamic programming  
 estimating  
 GERT  
 management methods  
 ∞ methodology  
 mission planning  
 operations research  
 ∞ paths  
 PERT  
 planning  
 program trend line analysis  
 programming (scheduling)  
 project management  
 research  
 sequencing  
 sneak circuit analysis

## critical point

systems engineering

### critical point

DEF The thermodynamic state in which liquid and gas phases of a substance coexist in equilibrium at the highest possible temperature. At higher temperature than the critical no liquid phase can exist.

GS thermodynamic properties  
. thermophysical properties

. . . **critical point**  
RT Mayer problem

### critical pressure

DEF In rocketry, the pressure in the nozzle throat for which the isentropic weight flow rate is maximum. The pressure of a gas at the critical point, which is the highest pressure under which a liquid can exist in equilibrium with its vapor.

GS pressure  
. **critical pressure**  
thermodynamic properties  
. thermophysical properties

. . . **critical pressure**  
RT degenerate matter  
high pressure  
liquid phases  
supercritical pressures  
vapor phases

*critical Reynolds number*

USE **Reynolds number**

*critical speed*

USE **critical velocity**

*critical stress*

USE **critical loading**

### critical temperature

DEF The temperature above which a substance cannot exist in the liquid state regardless of the pressure. As applied to reactor overheat or afterheat, the temperature at which the least resistant component of the reactor core begins to melt down. As applied to materials, the temperature at which a change in phase takes place causing an appreciable change in the properties of the material.

GS temperature  
. **critical temperature**  
thermodynamic properties  
. thermophysical properties

. . . **critical temperature**  
RT critical current  
cryogenic temperature  
heat treatment  
high temperature superconductors  
metallic hydrogen  
noncondensable gases  
phase diagrams  
phase transformations

### critical velocity

DEF In rocketry, the speed of sound at the conditions prevailing at the nozzle throat. Used for critical Mach number, critical Reynolds number, and critical speed.

UF *critical Mach number*  
*critical speed*

GS rates (per time)  
. **critical velocity**  
velocity

. . . **critical velocity**  
RT exhaust velocity  
resonant frequencies  
Reynolds number  
tip speed

### Croatia

(added October 1994)

GS nations  
. **Croatia**  
RT Bosnia and Herzegovina  
Europe  
Yugoslavia

### Crocco method

RT axisymmetric flow  
boundary layers

compressible flow  
compressible fluids  
entropy  
inviscid flow  
∞ methodology  
shock wave propagation  
steady flow  
vorticity

### Crocco-Lee theory

RT boundary layer separation  
continuity equation  
gas flow  
inviscid flow  
mass flow  
multiphase flow  
reattached flow  
separated flow  
∞ theories

### Croloy

GS alloys  
. iron alloys  
. . . steels  
. . . **Croloy**

### crop calendars

DEF Schedules for the maturation and harvesting of seasonal crops.

GS calendars  
. **crop calendars**

RT ∞ crops  
farm crops  
growth  
scheduling  
seasons

### crop dusting

DEF The application of fungicides or insecticides in powder form to a crop, usually from a low flying aircraft.

GS spraying  
. **crop dusting**  
RT aerosols  
agricultural aircraft  
agriculture  
dispersions  
farm crops  
pesticides  
powder (particles)

### crop growth

GS growth  
. vegetation growth  
. . . **crop growth**  
RT agriculture  
alfalfa  
barley  
blight  
citrus trees  
corn  
∞ crops  
Earth resources  
farm crops  
farmlands  
germination  
grasslands  
Large Area Crop Inventory  
Experiment  
oats  
orchards  
photosynthesis  
photosynthetically active radiation  
plant diseases  
plant stress  
plants (botany)  
sugar beets  
sugar cane  
thermal resources  
vineyards  
wheat

### crop identification

GS identifying  
. **crop identification**  
RT agriculture  
∞ crops  
Earth resources  
evaluation  
farmlands

ground truth  
imaging techniques  
leaf area index  
multispectral photography  
plant diseases  
recognition  
remote sensors  
∞ sensors  
sorghum  
spectral signatures  
SPOT (French satellite)  
sunflowers  
timber identification  
vegetative index

### crop inventories

DEF Numerical estimates of vegetable, fruit, and other commercial farm products based on the analysis of photography or imagery from aircraft or satellites made during periodic passes during the growth cycle.

GS inventories  
. **crop inventories**  
RT agriculture  
AgRISTARS project  
farm crops  
farmlands  
Large Area Crop Inventory  
Experiment  
leaf area index  
remote sensors  
vegetative index

*Crop Inventories by Remote Sensing*

USE **AgRISTARS project**

### crop vigor

RT agriculture  
alfalfa  
barley  
blight  
citrus trees  
farm crops  
farmlands  
genetically modified plants  
irrigation  
normalized difference vegetation  
index  
oats  
orchards  
phototropism  
plant diseases  
plant stress  
plants (botany)  
sugar beets  
sugar cane  
thermal resources  
vegetation growth  
viability  
vineyards  
wheat

*croplands*

USE **farmlands**

∞ **crops**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT agriculture  
alfalfa  
barley  
biomass energy production  
citrus trees  
corn  
crop calendars  
crop growth  
crop identification  
farm crops  
farmlands  
frost damage  
Large Area Crop Inventory  
Experiment  
orchards  
planting  
sorghum  
sunflowers  
tomatoes  
vineyards

- wheat
- cross correlation**
  - GS correlation
  - RT autocorrelation
  - data correlation
- cross coupling**
  - GS coupling
  - RT communication theory
  - couples
  - coupling circuits
  - microwave coupling
  - optical coupling
  - radio frequency interference
- cross faults*
- USE **geological faults**
- cross flow**
  - DEF A flow going across another flow, as a spanwise flow over a wing.
  - GS fluid flow
  - RT aerodynamic characteristics
  - ∞ flow
  - flow characteristics
  - flow geometry
  - spanwise blowing
  - water tunnel tests
- cross polarization**
  - DEF The component of the electric field vector normal to the desired polarization component.
  - GS polarization (waves)
  - RT optical coupling
  - optical properties
  - polarized electromagnetic radiation
  - polarons
  - rotation
- cross relaxation**
  - RT masers
  - ∞ relaxation
  - rutile
  - spin-spin coupling
- ∞ **cross sections**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF Measures of the effectiveness of particular processes expressed either as areas (geometric cross sections) which would produce the observed results, or as ratios.
  - RT absorption cross sections
  - airfoil profiles
  - area
  - atomic collisions
  - collision parameters
  - distribution (property)
  - drawings
  - geometry
  - gradients
  - ionization cross sections
  - mean free path
  - neutron cross sections
  - planforms
  - radar cross sections
  - scattering cross sections
  - shapes
  - stopping power
  - surveys
  - two dimensional bodies
- crossbedding (geology)**
  - GS geology
  - RT landforms
  - rocks
  - strata
  - stratification
  - stratigraphy
- crossed field amplifiers**
  - GS amplifiers
  - microwave amplifiers
- ∞ **crossed field amplifiers**
  - microwave equipment
  - microwave amplifiers
- RT **crossed field amplifiers**
  - electron tubes
  - magnetrons
  - traveling wave tubes
- crossed field guns**
  - RT electron guns
  - ∞ guns
  - plasma control
  - plasma guns
  - plasma jets
- crossed fields**
  - RT electric fields
  - field theory (physics)
  - magnetic fields
  - magnetrons
  - plasma control
  - waveguides
- crossings**
  - GS crossings
  - chiasm
  - RT bridges (structures)
  - crossovers
  - intersections
  - pipelines
  - ramps (structures)
- crosslinking**
  - GS crosslinking
  - vulcanizing
  - RT addition resins
  - coupled modes
  - curing
  - ∞ joining
  - netting (materials/structures)
  - phenolic epoxy resins
- crossovers**
  - RT bridges (structures)
  - crossings
  - intersections
- crosstalk**
  - DEF Electrical disturbances in a communication channel as a result of coupling with other communication channels.
  - GS electromagnetic interference
  - ∞ **crosstalk**
  - ionospheric cross modulation
  - RT communicating
  - electromagnetic compatibility
  - ∞ interference
  - telephony
  - wave diffraction
- crowding**
  - RT ∞ concentration
  - ∞ saturation
- CRRES (satellite)**
  - (added April 1993)
  - UF Combined Release and Radiation Effects Sat
  - GS artificial satellites
  - scientific satellites
  - ∞ **CRRES (satellite)**
  - chemical clouds
  - RT chemical release modules
  - Earth ionosphere
  - Earth magnetosphere
  - extraterrestrial radiation
  - orbital space tests
  - radiation effects
  - space plasmas
  - spaceborne experiments
- crucibles**
  - RT ∞ containers
  - heating equipment
- cruciform wings**
  - GS airfoils
  - wings
  - ∞ **cruciform wings**
  - RT fixed wings
- low aspect ratio wings
- crude oil**
  - UF petroleum
  - GS fuels
  - chemical fuels
  - ∞ hydrocarbon fuels
  - ∞ fossil fuels
  - ∞ **crude oil**
  - geophysical fluids
  - ∞ **crude oil**
  - oils
  - ∞ **crude oil**
  - resources
  - Earth resources
  - ∞ fossil fuels
  - ∞ **crude oil**
  - RT carbonaceous materials
  - deposits
  - energy policy
  - fuel production
  - offshore energy sources
  - oil exploration
  - oil fields
  - petroleum products
  - reserves
  - underwater resources
  - waxes
- cruise missiles**
  - DEF Guided missiles, the major portion of whose flight path to its target is conducted at approximately constant velocity - depends on the dynamic reaction of air for lift, and upon propulsive forces to balance drag.
  - GS missiles
  - surface to surface missiles
  - ∞ **cruise missiles**
  - ∞ Navaho missile
  - ∞ Tomahawk missiles
  - RT antiship missiles
  - terrain following
- cruising flight**
  - RT coasting flight
  - ∞ flight
  - horizontal flight
- Crusader aircraft*
- USE **F-8 aircraft**
- crushers**
  - RT comminution
  - crushing
  - disintegration
  - grinding mills
  - impactors
- crushing**
  - GS comminution
  - ∞ **crushing**
  - RT crushers
  - disintegration
  - grinding (comminution)
- crustal dynamics*
- USE **Earth crust geodynamics**
- crustal fractures**
  - GS fracturing
  - ∞ **crustal fractures**
  - RT Earth crust
  - Earth movements
  - Earth surface
  - earthquake resistance
  - earthquakes
  - geodynamics
  - geological faults
  - microseisms
  - P waves
  - S waves
  - San Andreas Fault
  - seismic waves
  - seismology
  - shatter cones
  - shock loads
  - shock waves
  - soil mechanics

## crusts

surface waves

### crusts

- GS **crusts**
  - . lunar crust
  - . planetary crusts
  - . . Earth crust
- RT lunar mantle
- planetary mantles

### cryochemistry

- DEF The study of chemical phenomena in very low temperature environment.
- GS physical chemistry
  - . **cryochemistry**
- RT ∞ chemistry
  - cryogenic equipment
  - cryogenics
  - low temperature physics

### cryocycle principle

- RT cryopumping
- spacecraft power supplies

### cryodeposits

- GS deposits
  - . **cryodeposits**
- RT coatings
- ∞ cryogenic storage
- cryogenics

### cryogenic computer storage

- GS computer components
  - . computer storage devices
  - . . **cryogenic computer storage**
- RT ∞ cryogenic storage
- cryotrons
- ∞ equipment
- superconductors (materials)

### cryogenic cooling

- DEF Use of cryogenic fluids to reach temperatures near absolute zero.
- GS cooling
  - . **cryogenic cooling**
- RT capillary pumped loops
- coolers
- cryogenics
- freezing
- heat transfer
- refrigerating

### cryogenic equipment

- UF *Dewar systems*
- RT cryochemistry
- cryogenics
- ∞ equipment
- gravitational wave antennas
- refrigerating
- refrigerating machinery
- solid cryogenics

### cryogenic fluid storage

- RT cold surfaces
- ∞ cryogenic storage
- cryogenic tanks
- evaporative cooling
- fluid management
- fuel tanks
- multilayer insulation
- space storage
- ∞ storage
- storage tanks
- thermal insulation

### cryogenic fluids

- GS liquids
  - . **cryogenic fluids**
  - . . Fermi liquids
  - . . FLOX
  - . . liquid helium
  - . . . liquid helium 2
  - . . liquid hydrogen
  - . . liquid nitrogen
  - . . liquid oxygen
- RT cryogenic tanks
- cryogenic temperature
- cryogenics
- cryopumping
- fluid management

- ∞ fluids
- rocket oxidizers
- solid cryogen cooling
- solidified gases

### cryogenic gyroscopes

- GS gyroscopes
  - . **cryogenic gyroscopes**
- RT high temperature superconductors

### cryogenic magnets

- GS magnets
  - . **cryogenic magnets**
- RT high temperature superconductors
- superconducting magnets

### cryogenic rocket propellants

- DEF Rocket fuels, oxidizers, or propulsion fluids which are liquid only at very low temperatures.
- GS propellants
  - . rocket propellants
  - . . liquid rocket propellants
  - . . . **cryogenic rocket propellants**
- RT cryogenics
- endothermic fuels
- fluid management
- gaseous rocket propellants
- gelled rocket propellants
- high energy fuels
- high energy propellants
- hybrid propellants
- hydrogen fuels
- hypergolic rocket propellants
- liquefied gases
- liquid hydrogen
- liquid oxygen
- RL-10 engines
- slush
- space storage
- storable propellants

### ∞ cryogenic storage

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT cryodeposits
- cryogenic computer storage
- cryogenic fluid storage

### cryogenic tanks

- (added August 2003)
- DEF Containers or other structures designed to hold cryogenic materials.
- UF *cryotanks*
- GS tanks (containers)
  - . **cryogenic tanks**
- RT cryogenic fluid storage
- cryogenic fluids
- space storage
- storage tanks

### cryogenic temperature

- UF *ultralow temperature*
- GS temperature
  - . low temperature
  - . . **cryogenic temperature**
- RT absolute zero
- cold traps
- critical temperature
- cryogenic fluids
- cryogenics
- Curie temperature
- solidified gases
- space temperature

### cryogenic wind tunnels

- DEF Wind tunnels employing a cryogenic environment and utilizing independent control over Mach number, Reynolds number, aeroelastic effects, and model-tunnel interactions.
- GS test facilities
  - . wind tunnels
  - . . **cryogenic wind tunnels**
- RT flight simulators
- test chambers

### cryogenics

- DEF The study of the methods of producing very low temperatures. The study of the behav-

ior of materials and processes at cryogenic temperatures.

- RT absolute zero
- cold traps
- cooling
- cryochemistry
- cryodeposits
- cryogenic cooling
- cryogenic equipment
- cryogenic fluids
- cryogenic rocket propellants
- cryogenic temperature
- cryopumping
- cryosar
- cryostats
- cryotrons
- Fermi liquids
- high temperature superconductors
- Joule-Thomson effect
- liquefied gases
- low temperature
- low temperature physics
- refrigerating
- solid cryogen cooling
- solid cryogenics
- solid nitrogen
- solidified gases
- superconducting power transmission
- superconductivity
- thermoelectric cooling
- thermomagnetic cooling

### cryolite

- GS aluminum compounds
  - . **cryolite**
  - halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . **cryolite**
  - . . fluoro compounds
  - . . . **cryolite**
  - . halides
  - . . fluorides
  - . . . **cryolite**
  - minerals
  - . **cryolite**
  - sodium compounds
  - . **cryolite**
- RT aluminum

### cryopumping

- DEF The process of removing gas from a system by condensing it on a surface maintained at very low temperatures.
- RT cryocycle principle
- cryogenic fluids
- cryogenics
- ∞ pumping
- vacuum pumps

### cryosar

- GS electronic equipment
  - . diodes
  - . . semiconductor diodes
  - . . . avalanche diodes
  - . . . . **cryosar**
  - . solid state devices
  - . . semiconductor devices
  - . . . avalanche diodes
  - . . . . **cryosar**
  - rectifiers
  - . avalanche diodes
  - . . **cryosar**
- RT Barritt diodes
- computer storage devices
- cryogenics

### cryosorption

USE **sorption**

### ∞ cryospheres

- (added June 1996)
- SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))
- RT Earth cryosphere
- planetary cryospheres
- planetary environments

### cryostats

- GS control equipment

. regulators  
 . . . **cryostats**  
 RT controllers  
 cryogenics  
 electric switches  
 high temperature tests  
 liquid helium  
 liquid helium 2  
 low temperature tests  
 temperature control  
 thermostats

*cryotanks*  
 (added August 2003)  
 USE **cryogenic tanks**

**cryotrapping**  
 GS trapping  
 . **cryotrapping**  
 RT cold traps

**cryotrons**  
 DEF Devices based upon the principle that superconductivity established at temperatures near absolute zero is destroyed by the application of a magnetic field.  
 GS electronic equipment  
 . solid state devices  
 . . **cryotrons**  
 switches  
 . electric switches  
 . . **cryotrons**  
 RT cryogenic computer storage  
 cryogenics  
 superconductivity  
 superconductors (materials)

**cryptography**  
 DEF The science of preparing messages in a form which cannot be read by those not privy to the secrets of the form.  
 GS **cryptography**  
 . quantum cryptography  
 RT ∞ codes  
 coding  
 computer information security  
 decoding  
 information theory  
 message processing  
 steganography

**crystal defects**  
 DEF Departure from the regular arrangement of atoms in the ideal crystal lattice.  
 UF *lattice imperfections*  
*stacking faults*  
 GS defects  
 . **crystal defects**  
 . . crystal dislocations  
 . . . edge dislocations  
 . . . screw dislocations  
 . . point defects  
 . . . vacancies (crystal defects)  
 . . . . Frenkel defects  
 . . . . antisite defects  
 RT crystallography  
 embedded atom method  
 holes (electron deficiencies)  
 impurities  
 interstitials  
 lattice vibrations  
 mechanical twinning  
 order-disorder transformations  
 pinning  
 polygonization  
 stacking fault energy  
 stacks  
 surface defects  
 trapping  
 twinning

**crystal dislocations**  
 DEF Types of lattice imperfections whose existence in metals is postulated in order to account for the phenomenon of crystal growth and of slip, particularly for the low value of shear stress required to initiate slip.  
 GS defects  
 . crystal defects  
 . . **crystal dislocations**

. . . edge dislocations  
 . . . screw dislocations  
 dislocations (materials)  
 . **crystal dislocations**  
 . . edge dislocations  
 . . screw dislocations  
 antiphase boundaries  
 fatigue (materials)  
 grain boundaries  
 pinning  
 point defects  
 Portevin-le Chatelier effect  
 superlattices  
 superplasticity  
 surface defects

RT

*crystal field splitting*  
 USE **crystal field theory**

**crystal field theory**  
 (added January 1993)  
 UF *crystal field splitting*  
*crystal fields*  
 GS field theory (physics)  
 . **crystal field theory**  
 RT crystal lattices  
 electric fields  
 metal ions

*crystal fields*  
 USE **crystal field theory**

**crystal filters**  
 GS electromagnetic wave filters  
 . bandpass filters  
 . . **crystal filters**  
 . electric filters  
 . . **crystal filters**  
 RT bandstop filters  
 ∞ filters  
 intermediate frequency amplifiers  
 radio equipment  
 radio filters  
 tunable filters

**crystal growth**  
 GS growth  
 . **crystal growth**  
 . . Czochralski method  
 . . directional solidification (crystals)  
 . . epitaxy  
 . . . atomic layer epitaxy  
 . . . electroepitaxy  
 . . . liquid phase epitaxy  
 . . . molecular beam epitaxy  
 . . . vapor phase epitaxy  
 . . hydrothermal crystal growth  
 . . protein crystal growth  
 . . traveling solvent method  
 . . Verneuil process  
 RT Aitken nuclei  
 Bravais crystals  
 Bridgman method  
 buoyancy-driven flow  
 containerless melts  
 crystal morphology  
 crystallization  
 crystallography  
 crystals  
 doped crystals  
 float zones  
 inoculation  
 laser deposition  
 mechanical twinning  
 melts (crystal growth)  
 metalorganic chemical vapor  
 deposition  
 ∞ microgravity applications  
 nanostructure growth  
 netting (materials/structures)  
 nucleation  
 polygonization  
 pulsed laser deposition  
 rapid quenching (metallurgy)  
 space processing  
 twinning  
 vapor deposition

**crystal lattices**  
 DEF Three-dimensional, recurring patterns

in which the atoms of crystals are arranged.  
 GS **crystal lattices**  
 . close packed lattices  
 . cubic lattices  
 . . body centered cubic lattices  
 . . face centered cubic lattices  
 . superlattices  
 RT antiphase boundaries  
 atomic structure  
 Bravais crystals  
 Brillouin zones  
 chemical bonds  
 coordination number  
 crystal field theory  
 crystal morphology  
 crystallography  
 crystals  
 doping (materials)  
 epitaxy  
 geometry  
 graphoepitaxy  
 hexagonal cells  
 ionic crystals  
 Ising model  
 isomorphism  
 Kossel pattern  
 lattice energy  
 lattice parameters  
 lattice vibrations  
 ∞ lattices  
 Laue method  
 Laves phases  
 metal crystals  
 metallography  
 molecular chains  
 molecular structure  
 Mossbauer effect  
 order-disorder transformations  
 particle in cell technique  
 Patterson map  
 polymorphism  
 rapid quenching (metallurgy)  
 single crystals  
 synthetic metals  
 ultrapure metals

**crystal morphology**  
 (added October 2002)  
 DEF Characterization of a crystal by the shape and relative angular position of its faces.  
 GS morphology  
 . **crystal morphology**  
 RT crystal growth  
 crystal lattices  
 crystal structure  
 crystal surfaces  
 crystallography  
 crystals  
 shapes

**crystal optics**  
 RT aberration  
 acousto-optics  
 Bragg cells  
 diffraction  
 doped crystals  
 fiber optics  
 geometrical optics  
 ∞ optics  
 phase matching  
 photorefractivity  
 physical optics

**crystal oscillators**  
 GS crystals  
 . **crystal oscillators**  
 . . piezoelectric crystals  
 oscillators  
 . **crystal oscillators**  
 . . piezoelectric crystals  
 RT electrical properties  
 frequency control  
 frequency stability  
 oscillations  
 piezoelectricity

**crystal rectifiers**  
 UF *silicon rectifiers*  
 GS electronic equipment  
 . diodes

## crystal structure

- . . **crystal rectifiers**
- . solid state devices
- . . **crystal rectifiers**
- rectifiers
- . **crystal rectifiers**
- RT current converters (AC to DC)
- semiconductor devices

**crystal structure**

- SN (AGGLOMERATIONS OF CRYSTALS--EXCLUDES CRYSTAL LATTICES)
- GS **crystal structure**
- . Widmanstätten structure
- RT Abrikosov theory
- allotropy
- anisotropy
- antiphase boundaries
- Bravais crystals
- clathrates
- coordination number
- crystal morphology
- crystallinity
- crystallites
- crystals
- doped crystals
- enantiomers
- epitaxy
- ferroelasticity
- graphoepitaxy
- interstitials
- isomorphism
- isotropy
- Laves phases
- liquid phase epitaxy
- mechanical twinning
- metal crystals
- microstructure
- molecular dynamics
- nanocrystals
- nanostructure (characteristics)
- order-disorder transformations
- packing density
- Patterson map
- phonons
- polycrystals
- polymorphism
- rapid quenching (metallurgy)
- spherulites
- ∞ structures
- superlattices
- twinning
- vapor phase epitaxy

**crystal surfaces**

- GS solid surfaces
- . **crystal surfaces**
- RT atomic force microscopy
- crystal morphology
- metal surfaces
- surface layers
- ∞ surfaces

**crystallinity**

- RT amorphous materials
- crystal structure

**crystallites**

- GS crystals
- . **crystallites**
- . . spherulites
- RT crystal structure
- microcrystals
- minerals
- rosette shapes

**crystallization**

- UF *devitrification*
- GS **crystallization**
- . directional solidification (crystals)
- . melt spinning
- . recrystallization
- RT agglomeration
- concentrating
- containerless melts
- crystal growth
- demineralizing
- freezing
- inoculation
- liquidus
- materials recovery

- melts (crystal growth)
- modulation
- nucleation
- Ostwald ripening
- phase stability (materials)
- phase transformations
- precipitation (chemistry)
- purification
- refining
- ∞ separation
- settling
- solid state
- solidification
- sublimation
- submarine hydrothermal vents
- supercooling
- supersaturation
- zone melting

**crystallography**

- RT Bragg angle
- crystal defects
- crystal growth
- crystal lattices
- crystal morphology
- crystals
- Debye-Scherrer method
- directivity
- isotropy
- lamella (metallurgy)
- lattice parameters
- Laue method
- metallography
- ∞ metallurgy
- microbeams
- microstructure
- mineralogy
- neutron diffraction
- order-disorder transformations
- ∞ orientation
- radiography
- ∞ solid state physics
- x ray analysis
- x ray diffraction

**crystals**

- GS **crystals**
- . bicrystals
- . boules
- . Bravais crystals
- . creatine
- . crystal oscillators
- . . piezoelectric crystals
- . crystallites
- . . spherulites
- . dendritic crystals
- . doped crystals
- . ionic crystals
- . liquid crystals
- . metal crystals
- . microcrystals
- . mixed crystals
- . nanocrystals
- . polycrystals
- . quartz crystals
- . single crystals
- . whiskers (crystals)
- RT anisotropy
- body centered cubic lattices
- clathrates
- containerless melts
- crystal growth
- crystal lattices
- crystal morphology
- crystal structure
- crystallography
- electroepitaxy
- face centered cubic lattices
- ∞ grains
- isotropy
- packing density
- phase matching
- ruby

- spherules

CSM

USE **command service modules**

CT-114 aircraft

USE **CL-41 aircraft**

CTD

USE **charge transfer devices**

**Cuba**

- GS landforms
- . islands
- . . West Indies
- . . . **Cuba**
- nationalities
- . **Cuba**
- RT Caribbean region
- Caribbean Sea

**cubane**

- GS organic compounds
- . hydrocarbons
- . . **cubane**

**cubes (mathematics)**

- GS geometry
- . Euclidean geometry
- . . polyhedrons
- . . . **cubes (mathematics)**
- RT blocks

**cubic equations**

- GS algebra
- . nonlinear equations
- . . **cubic equations**
- analysis (mathematics)
- . real variables
- . . nonlinear equations
- . . . **cubic equations**
- field theory (algebra)
- . **cubic equations**
- RT ∞ equations
- polynomials

**cubic lattices**

- GS crystal lattices
- . **cubic lattices**
- . . body centered cubic lattices
- . . face centered cubic lattices
- RT Laves phases

**cues**

- GS **cues**
- . zeitgebers
- RT auditory signals
- visual signals

*cuestas*

USE **ridges**

**cuffs**

- RT clothing
- seals (stoppers)

**cultivation**

- GS **cultivation**
- . plowing
- ammonia
- ammonium nitrates
- ashes
- culture media
- culture techniques
- fertilizers
- planting
- silviculture
- soils
- tissues (biology)

**cultural resources**

- DEF Archaeological and historical sites.
- RT archaeology
- human beings

**culture (social sciences)**

- RT American Indians
- anthropology
- artifacts
- Eskimos
- ethnic factors

governments  
 minorities  
 politics  
 race factors  
 races (anthropology)  
 regimes  
 social factors  
 sociology

#### **culture media**

(added August 2004)

DEF Any liquid or solid preparation made specifically for the growth, storage, or transport of microorganisms or other types of cells. The variety of media that exists allow for the culturing of specific microorganisms and cell types, such as differential media, selective media, test media, and defined media.

GS culture techniques  
 . **culture media**

RT cell culturing  
 cells (biology)  
 clone cells  
 cloning (biology)  
 cultivation  
 cultured cells  
 microbiology  
 organ culturing  
 tissue culturing  
 tissue engineering

#### **culture techniques**

GS **culture techniques**

. cell culturing  
 . culture media  
 . organ culturing  
 . tissue culturing

RT Chlorella  
 clone cells  
 cloning (biology)  
 cultivation  
 cultured cells  
 in vitro methods and tests  
 in vivo methods and tests  
 microbiology  
 stem cells  
 tissue engineering

#### **cultured cells**

(added August 2004)

DEF Cells propagated in vitro in special media conducive to their growth. Cultured cells are used to study developmental, morphologic, metabolic, physiologic, and genetic processes, among others.

UF *cell lines*  
 GS cells (biology)  
 . **cultured cells**  
 . . clone cells

RT biotechnology  
 cell culturing  
 cloning (biology)  
 culture media  
 culture techniques  
 in vitro methods and tests  
 microbiology  
 organ culturing  
 tissue culturing

#### **cumulative damage**

GS damage  
 . **cumulative damage**

RT component reliability  
 defects  
 degradation  
 durability  
 failure  
 operational hazards  
 reliability  
 structural reliability  
 wear tests

#### **cumulonimbus clouds**

DEF A cumuliform cloud type: heavy and dense, with considerable vertical extent in the form of massive towers. This form frequently exhibits tops in the shape of an anvil or massive plume. It is frequently accompanied by lightning, thunder, and sometimes hail; occasionally producing a tornado or a waterspout.

GS clouds (meteorology)  
 . convection clouds  
 . . **cumulonimbus clouds**  
 . . . anvil clouds  
 RT cumulus clouds  
 nimbostratus clouds  
 precipitation (meteorology)  
 thunderstorms  
 tornadoes

#### **cumulus clouds**

DEF Clouds in the form of individual detached domes or towers which are usually dense and well defined. These clouds develop vertically in the form of rising mounds. The sunlit parts are mostly brilliantly white; their bases are relatively dark and nearly horizontal.

GS clouds (meteorology)  
 . convection clouds  
 . . **cumulus clouds**  
 . . . anvil clouds

RT cumulonimbus clouds  
 stratocumulus clouds

#### **Cupola Module**

(added May 2008)

DEF A permanent observation and control module for the International Space Station developed by the European Space Agency. The module's windows allow line-of-sight monitoring of outside activities, including spacewalks, docking operations and exterior equipment surveys.

GS modules  
 . space station modules  
 . . **Cupola Module**

RT European Space Agency  
 International Space Station  
 spacecraft modules

#### **∞ cupolas**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT domes (structural forms)  
 furnaces  
 gun turrets

#### **cuprates**

(added April 1999)

GS copper compounds  
 . **cuprates**  
 RT BSCCO superconductors  
 copper oxides  
 YBCO superconductors

#### **curare**

GS poisons  
 . **curare**  
 RT alkaloids  
 anticholinergics  
 ∞ poisoning  
 toxicology

#### **cures**

RT diseases  
 drugs  
 first aid  
 healing  
 therapy

#### **Curie temperature**

DEF The temperature in a ferromagnetic material above which the material becomes substantially nonmagnetic.

GS magnetic properties  
 . **Curie temperature**  
 temperature

RT cryogenic temperature  
 diamagnetism  
 electrets  
 ferroelectricity  
 ferromagnetism

#### **Curie-Weiss law**

RT ferromagnetism  
 magnetic permeability  
 magnetic properties

paramagnetism

#### **curing**

RT alfalfa  
 autoclaving  
 citrus trees  
 corn  
 crosslinking  
 degradation  
 drying  
 farm crops  
 glass transition temperature  
 oats  
 orchards  
 preserving  
 resin transfer molding  
 ∞ setting  
 vulcanizing  
 weathering

#### **curium**

GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . **curium**  
 . . . . curium isotopes  
 . . . . . curium 242  
 . . . . . curium 244  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements  
 . . . . . **curium**  
 . . . . . . curium isotopes  
 . . . . . . . curium 242  
 . . . . . . . curium 244  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . **curium**  
 . . . . curium isotopes  
 . . . . . curium 242  
 . . . . . curium 244

#### **curium 242**

GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . curium  
 . . . . curium isotopes  
 . . . . . **curium 242**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements  
 . . . . . curium  
 . . . . . . curium isotopes  
 . . . . . . . **curium 242**  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . curium  
 . . . . curium isotopes  
 . . . . . **curium 242**

#### **curium 244**

GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . curium  
 . . . . curium isotopes  
 . . . . . **curium 244**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements  
 . . . . . curium  
 . . . . . . curium isotopes  
 . . . . . . . **curium 244**  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . curium  
 . . . . curium isotopes  
 . . . . . **curium 244**

#### **curium compounds**

GS actinide series compounds  
 . **curium compounds**  
 RT ∞ chemical compounds



## curium isotopes

∞ Group 3B compounds

### curium isotopes

GS chemical elements  
  . actinide series  
  . . . transuranium elements  
  . . . . curium  
  . . . . . **curium isotopes**  
  . . . . . . curium 242  
  . . . . . . curium 244  
  . . . . . nuclides  
  . . . . . isotopes  
  . . . . . radioactive isotopes  
  . . . . . transuranium elements  
  . . . . . . curium  
  . . . . . . . **curium isotopes**  
  . . . . . . . . curium 242  
  . . . . . . . . curium 244  
  metals  
  . actinide series  
  . . transuranium elements  
  . . . curium  
  . . . . **curium isotopes**  
  . . . . . curium 242  
  . . . . . curium 244

### curl (materials)

RT dimensional stability  
  folding  
∞ materials  
  textures

### curl (vectors)

DEF A vector operation upon a vector field which represents the rotation of the field, related to the circulation of the field at each point.

GS analysis (mathematics)  
  . calculus  
  . . vector analysis  
  . . . **curl (vectors)**  
  . . . . vorticity  
  . . . . . real variables  
  . . . . . vector analysis  
  . . . . . . **curl (vectors)**  
  . . . . . . . vorticity  
  geometry  
  . vector analysis  
  . . **curl (vectors)**  
  . . . vorticity

### current algebra

GS algebra  
  . **current algebra**  
RT ∞ mathematics  
  nuclear physics  
  vector currents

### current amplifiers

GS amplifiers  
  . **current amplifiers**  
  . . photomultiplier tubes  
  . . . frequency modulation  
    photomultipliers  
RT transistor amplifiers  
  voltage amplifiers

### current converters (AC to DC)

RT alternating current  
∞ converters  
  crystal rectifiers  
  direct current  
  electric current  
  inverted converters (DC to AC)  
  rectifiers  
  silicon controlled rectifiers  
  thyratrons

### current density

GS rates (per time)  
  . flux density  
  . . **current density**  
RT critical current  
  electric current  
  electrolysis  
  electroplating  
  pinning

### current distribution

GS distribution (property)  
  . **current distribution**

RT charge distribution  
  electron distribution  
∞ hole distribution  
  hole distribution (electronics)  
  ion distribution  
  magnetic annular arc  
  neutral currents

### current regulators

UF *current stabilizers*  
GS control equipment  
  . regulators  
  . . **current regulators**  
RT circuit protection  
  controllers  
  electric current  
∞ electric equipment  
  electric switches  
  electronic control  
  limiter circuits  
  power factor controllers  
  power supply circuits  
  switching circuits  
  transmission loss  
  voltage regulators

### current sheets

RT antennas  
  electric current  
  magnetic flux  
  magnetic islands  
∞ sheets

### current stabilizers

USE **current regulators**

### ∞ currents

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air currents  
  air flow  
  beam currents  
  circulation  
  coastal currents  
  electric current  
  external surface currents  
  fluid flow  
  ocean currents  
  water currents

### currents (oceanography)

USE **water currents**

### curtains

RT ∞ barriers  
  dividers  
  doors  
  entrances  
  openings  
∞ partitions  
  partitions (structures)  
∞ screens  
  separators  
  walls  
  windows (apertures)

### Curtiss C-46 aircraft

USE **C-46 aircraft**

### Curtiss-Wright aircraft

GS **Curtiss-Wright aircraft**  
  . C-46 aircraft  
  . X-19 aircraft  
RT ∞ aircraft

### curvature

GS geometry  
  . **curvature**  
RT camber  
∞ curves  
  curves (geometry)  
  differential geometry  
  flexing  
∞ profiles  
  shapes  
  zero force curves

### curve fitting

RT data compression  
  data smoothing

forecasting  
  least squares method  
  minimax technique  
  saddle points  
  statistical distributions  
  statistical tests  
  time series analysis

### curved beams

GS structural members  
  . beams (supports)  
  . . **curved beams**  
RT camber  
  I beams

### curved panels

GS panels  
  . **curved panels**  
RT contours  
  shapes  
  wing panels

### curved surfaces

USE **contours**  
  **shapes**  
  **surfaces**

### ∞ curves

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT curvature  
  graphs (charts)  
  learning curves  
  light curve  
  toroids  
  trajectories  
  zero force curves

### curves (geometry)

GS geometry  
  . **curves (geometry)**  
  . . catenaries  
  . . cycloids  
  . . epicycloids  
  . . S curves  
  . . . Gompertz curves  
RT analytic geometry  
∞ arcs  
  chords (geometry)  
  circles (geometry)  
  curvature  
  cusps (mathematics)  
  differential geometry  
  Euclidean geometry  
  geodesic lines  
∞ helices  
  homotopy theory  
  inflection points  
  line shape  
  manifolds (mathematics)  
  menisci  
  segments  
∞ spirals

### curvilinear coordinates

USE **spherical coordinates**

### Cushioncraft ground effect machine

GS ground effect machines  
  . **Cushioncraft ground effect machine**  
RT hovering  
  vertical takeoff aircraft

### cushions

RT air cushion landing systems  
  bumpers  
  couches  
  ground effect (aerodynamics)  
  hydraulic equipment  
∞ pad  
  pneumatic equipment  
  seats  
  shock absorbers  
  vibration isolators

### ∞ cusps

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cusps (landforms)

- cusps (mathematics)  
double cusps  
polar cusps
- cusps (landforms)**  
GS landforms  
. **cusps (landforms)**  
RT beaches  
coasts  
∞ cusps  
topography
- cusps (mathematics)**  
GS geometry  
. **cusps (mathematics)**  
. . double cusps  
RT curves (geometry)  
∞ cusps  
epicycloids  
maxima  
minima
- custom integrated circuits*  
USE **application specific integrated circuits**
- cutaneous perception*  
USE **touch**
- ∞ **cut-off**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF An act or instance of shutting something off; specifically, in rocketry, an act or instance of shutting off the propellant flow in a rocket, or stopping the combustion of the propellant.  
RT burnout  
engine failure  
machining
- cut-outs*  
USE **openings**
- cutters**  
SN (EXCLUDES SHIPS)  
GS **cutters**  
. blades (cutters)  
. . razor blades  
. drill bits  
. drills  
. saws  
. shears  
RT cutting  
dies  
laser cutting  
machine tools  
scrapers  
taps  
tools
- cutting**  
GS **cutting**  
. blanking (cutting)  
. laser cutting  
. metal cutting  
. milling (machining)  
. planing  
. scarfing  
. shearing  
. slicing  
. spark machining  
RT abrasion  
chipping  
comminution  
cutters  
drilling  
flaking  
forming techniques  
fracturing  
grinding (material removal)  
grooving  
machining  
micromachining  
peeling  
perforating  
piercing  
∞ separation  
shredding  
splitting
- torches
- CV-2 aircraft*  
USE **DHC 4 aircraft**
- CV-7 aircraft*  
USE **DHC 5 aircraft**
- CV-340 aircraft**  
UF *Convair 340 aircraft*  
GS commercial aircraft  
. **CV-340 aircraft**  
General Dynamics aircraft  
. **CV-340 aircraft**  
monoplanes  
. **CV-340 aircraft**  
passenger aircraft  
. **CV-340 aircraft**  
RT ∞ aircraft
- CV-440 aircraft**  
UF *Convair 440 aircraft*  
*Metropolitan aircraft*  
GS commercial aircraft  
. **CV-440 aircraft**  
General Dynamics aircraft  
. **CV-440 aircraft**  
monoplanes  
. **CV-440 aircraft**  
passenger aircraft  
. **CV-440 aircraft**  
RT ∞ aircraft
- CV-880 aircraft**  
UF *Convair 880 aircraft*  
GS commercial aircraft  
. **CV-880 aircraft**  
General Dynamics aircraft  
. **CV-880 aircraft**  
jet aircraft  
. **CV-880 aircraft**  
monoplanes  
. **CV-880 aircraft**  
passenger aircraft  
. **CV-880 aircraft**  
transport aircraft  
. **CV-880 aircraft**  
RT ∞ aircraft
- CV-990 aircraft**  
UF *Convair 990 aircraft*  
GS commercial aircraft  
. **CV-990 aircraft**  
General Dynamics aircraft  
. **CV-990 aircraft**  
jet aircraft  
. turbofan aircraft  
. . **CV-990 aircraft**  
monoplanes  
. **CV-990 aircraft**  
passenger aircraft  
. **CV-990 aircraft**  
RT ∞ aircraft
- CVD (deposition)*  
USE **vapor deposition**
- CVI (fabrication)*  
USE **chemical vapor infiltration**
- CVM (solid state)*  
(added July 1997)  
USE **cluster variation method**
- CW radar*  
USE **continuous wave radar**
- cyanamides**  
GS nitrogen compounds  
. amides  
. . **cyanamides**  
. cyano compounds  
. . **cyanamides**
- cyanates**  
RT esters
- urethanes
- cyanide emission*  
USE **CN emission**
- cyanides**  
GS **cyanides**  
. acetonitrile  
. cyanogen  
. iron cyanides  
. malononitrile  
. succinonitrile  
RT cyano compounds  
cyanoacetylene  
nitrogen compounds
- cyano compounds**  
GS nitrogen compounds  
. **cyano compounds**  
. . cyanamides  
. . cyanoacetylene  
. . isocyanates  
. . . diisocyanates  
. . . fulminates  
RT ∞ chemical compounds  
cyanides  
nitriles
- cyanoacetylene**  
GS nitrogen compounds  
. cyano compounds  
. . **cyanoacetylene**  
organic compounds  
. hydrocarbons  
. . **cyanoacetylene**  
RT acetylene  
cyanides
- cyanocobalamin**  
UF *vitamin B 12*  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **cyanocobalamin**  
vitamins  
. **cyanocobalamin**
- cyanogen**  
GS cyanides  
. **cyanogen**
- Cyanophyta*  
USE **blue green algae**
- cyanosis**  
GS diseases  
. **cyanosis**  
RT blood circulation  
heart function
- cyanurates**  
GS esters  
. **cyanurates**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . azines  
. . . . **cyanurates**  
pyrazines  
. azines  
. . **cyanurates**
- cyanuric acid**  
GS acids  
. **cyanuric acid**  
hydroxyl compounds  
. alcohols  
. . triols  
. . . **cyanuric acid**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . azines  
. . . . **cyanuric acid**  
pyrazines  
. azines

. . cyanuric acid

Cyber 74 computer  
USE **CDC Cyber 74 computer**

**cybernetics**

DEF The study of methods of control and communication which are common to living organisms and machines.

RT adaptive control  
automata theory

- ∞ automation
- biomimetics
- bionics
- communication theory
- computers
- ∞ control
- control systems design
- controllers
- depersonalization
- feedback
- human factors engineering
- information theory
- machine learning
- man machine systems
- management
- model reference adaptive control
- neural nets
- psychology
- ∞ systems
- systems engineering

**cycles**

DEF The complete sequences of values of a periodic quantity that occur during a period. Used for cycling and periodic processes.

UF *cycling*  
*periodic processes*

- GS **cycles**
- . activity cycles (biology)
  - . carbon cycle
  - . hydrological cycle
  - . solar cycles
  - . . sunspot cycle
  - . stress cycles
  - . thermodynamic cycles
  - . . Brayton cycle
  - . . Carnot cycle
  - . . Otto cycle
  - . . Rankine cycle
  - . . Stirling cycle
  - . photoperiod
  - . work-rest cycle

- RT alternations
- amplitudes
  - annual variations
  - cyclic loads
  - diurnal variations
  - fatigue (materials)
  - frequency distribution
  - harmonics
  - intermittency
  - long term effects
  - periodic variations
  - ∞ phases
  - reciprocation
  - rhythm (biology)
  - starting
  - superharmonics

**cyclic accelerators**

- GS particle accelerators
- . **cyclic accelerators**
  - . . betatrons
  - . . synchrocyclotrons
  - . . synchrotrons
  - . . . bevatron
  - . . . storage rings (particle accelerators)

RT ∞ accelerators

*cyclic adenosine monophosphate*

USE **cyclic AMP**

**cyclic AMP**

DEF A nucleotide which is implicated as an intracellular messenger in a wide variety of cellular processes. Prototypically it acts as a molecular transducer of nonsteroid signals from outside the cell to relevant cellular enzymes by a

series of reactions. Used for cyclic adenosine monophosphate.

UF *cyclic adenosine monophosphate*

- GS organic compounds
- . coenzymes
  - . . **cyclic AMP**
  - . . cyclic compounds
  - . . heterocyclic compounds
  - . . . adenosines
  - . . . **cyclic AMP**
  - . . nucleotides
  - . . adenosines
  - . . . **cyclic AMP**
  - . . phosphorus compounds
  - . . phosphates
  - . . **cyclic AMP**
- RT adenosine monophosphate
- adrenergics
  - alkynes
  - amino acids
  - cholinergics
  - guanines
  - pharmacology

**cyclic compounds**

DEF In organic chemistry, compounds containing a ring of atoms.

- GS organic compounds
- . **cyclic compounds**
  - . . cyclic hydrocarbons
  - . . . anthracene
  - . . . benzene
  - . . . chlorobenzenes
  - . . . colchicine
  - . . . cyclobutane
  - . . . cyclohexane
  - . . . cyclopropane
  - . . . durene
  - . . . indene
  - . . . menthol
  - . . . naphthalene
  - . . . naphthenes
  - . . . polycyclic aromatic hydrocarbons
  - . . . heterocyclic compounds
  - . . . acriflavine
  - . . . adenosines
  - . . . . adenosine diphosphate
  - . . . . adenosine monophosphate
  - . . . . adenosine triphosphate
  - . . . . cyclic AMP
  - . . . alkaloids
  - . . . atropine
  - . . . . betaines
  - . . . . caffeine
  - . . . . colchicine
  - . . . . ergotamine
  - . . . . hyoscine
  - . . . . lysergine
  - . . . . morphine
  - . . . . nicotinamide
  - . . . . nicotine
  - . . . . pilocarpine
  - . . . . reserpine
  - . . . . strychnine
  - . . . . tropanyl compounds
  - . . . anisole
  - . . . ascorbic acid
  - . . . azines
  - . . . . cyanurates
  - . . . . cyanuric acid
  - . . . . meclizine
  - . . . . methylene blue
  - . . . . phenothiazines
  - . . . azoles
  - . . . . acetazolamide
  - . . . . oxazole
  - . . . . pyrroles
  - . . . . . carbazoles
  - . . . azulene
  - . . . bioflavonoids
  - . . . biotin
  - . . . carnitine
  - . . . cyanocobalamin
  - . . . cytidylic acid
  - . . . dimenhydrinate
  - . . . endrin
  - . . . ethylene oxide
  - . . . folic acid
  - . . . furans

- . . . . tetrahydrofuran
- . . . . guanethidine
- . . . . HMX
- . . . . nicotinic acid
- . . . . phthalocyanin
- . . . . phylloquinone
- . . . . piperidine
- . . . . promethazine
- . . . . purines
- . . . . . adenines
- . . . . . xanthines
- . . . . . . caffeine
- . . . . . . guanines
- . . . . . . uric acid
- . . . . pyridines
- . . . . pyridoxine
- . . . . pyrimidines
- . . . . . alloxan
- . . . . . thymidine
- . . . . . thymine
- . . . . . uracil
- . . . . . indoles
- . . . . . RDX
- . . . . . retinene
- . . . . . riboflavin
- . . . . . tetracyclines
- . . . . . tetrazoles
- . . . . . thiamine
- . . . . . thiazine (trademark)
- . . . . . thiophenes
- . . . . . tocopherol
- . . . . . trimethadione
- . . . . . tryptamines
- . . . . . . tryptophan
- . . . . . . . melatonin
- . . . . . . . serotonin
- . . . . . imidazoles
- . . . . . rhodamine

RT ∞ chemical compounds  
cycloaddition  
organic chemistry

**cyclic hydrocarbons**

- GS organic compounds
- . cyclic compounds
  - . . **cyclic hydrocarbons**
  - . . . anthracene
  - . . . benzene
  - . . . chlorobenzenes
  - . . . colchicine
  - . . . cyclobutane
  - . . . cyclohexane
  - . . . cyclopropane
  - . . . durene
  - . . . indene
  - . . . menthol
  - . . . naphthalene
  - . . . naphthenes
  - . . . polycyclic aromatic hydrocarbons
  - . hydrocarbons
  - . . **cyclic hydrocarbons**
  - . . . anthracene
  - . . . benzene
  - . . . chlorobenzenes
  - . . . colchicine
  - . . . cyclobutane
  - . . . cyclohexane
  - . . . cyclopropane
  - . . . durene
  - . . . indene
  - . . . menthol
  - . . . naphthalene
  - . . . naphthenes
  - . . . polycyclic aromatic hydrocarbons
- RT alkynes

**cyclic loads**

- SN (LIMITED TO FORCE LOADS)
- GS loads (forces)
- . dynamic loads
  - . . **cyclic loads**
- RT cycles
- Eiber equation
  - inelastic stress
  - S-N diagrams
  - stress cycles
  - structural design criteria
  - transient loads
  - variable amplitude loading
  - vibration

- vibratory loads
- cycling*  
USE **cycles**
- cycloaddition**  
(added June 1998)  
DEF Pericyclic chemical reaction in which unsaturated molecules combine to form a cyclic compound under the influence of heat or light.  
GS chemical reactions  
  . **cycloaddition**  
  . Diels-Alder reactions  
RT cyclic compounds  
photochemical reactions  
polymerization  
synthesis (chemistry)
- cyclobutane**  
GS organic compounds  
  . cyclic compounds  
  . . cyclic hydrocarbons  
  . . . **cyclobutane**  
  . hydrocarbons  
  . . cyclic hydrocarbons  
  . . . **cyclobutane**
- cyclogenesis**  
RT arc clouds  
atmospheric circulation  
atmospheric pressure  
cyclones  
hurricanes  
low pressure  
storms (meteorology)
- cyclohexane**  
GS organic compounds  
  . cyclic compounds  
  . . cyclic hydrocarbons  
  . . . **cyclohexane**  
  . hydrocarbons  
  . . cyclic hydrocarbons  
  . . . **cyclohexane**  
RT benzene  
hexenes  
hydrogenation
- cycloids**  
GS geometry  
  . curves (geometry)  
  . . **cycloids**  
  . Euclidean geometry  
  . . analytic geometry  
  . . . **cycloids**
- cyclones**  
SN (METEOROLOGICAL--EXCLUDES EQUIPMENT)  
DEF Areas of low pressure with a closed circulation that rotate counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.  
GS storms  
  . storms (meteorology)  
  . . **cyclones**  
  . . . hurricanes  
  . . . . Anna hurricane  
  . . . typhoons  
RT anticyclones  
atmospheric pressure  
baroclinic waves  
cyclogenesis  
ground wind  
low pressure  
meteorology  
precipitation (meteorology)  
storm damage  
synoptic meteorology  
tornadoes  
tropical storms  
wind (meteorology)
- cyclones (equipment)*  
USE **centrifuges**
- cyclopropane**  
GS drugs  
  . anesthetics  
  . . **cyclopropane**  
  . organic compounds
- . cyclic compounds  
  . . cyclic hydrocarbons  
  . . . **cyclopropane**  
  . hydrocarbons  
  . . cyclic hydrocarbons  
  . . . **cyclopropane**  
RT propane
- Cyclops plasma accelerator**  
GS plasma accelerators  
  . **Cyclops plasma accelerator**  
RT ∞ accelerators  
plasmas (physics)
- cyclotetramethylene tetranitramine*  
USE **HMX**
- cyclotrimethylene trinitramine*  
USE **RDX**
- cyclotron frequency**  
DEF Frequency at which a charged particle orbits in a uniform magnetic field. It depends on the charge to mass ratio of the particle times the magnetic field. While the frequency is independent of the particle energy, Larmor orbit increases with energy.  
GS frequencies  
  . **cyclotron frequency**  
RT charged particles  
Larmor precession
- cyclotron radiation**  
DEF The electromagnetic radiation emitted by charged particles as they orbit in a magnetic field. The radiation arises from the centripetal acceleration of the particle as it moves in a circular orbit.  
GS electromagnetic radiation  
  . nonthermal radiation  
  . . **cyclotron radiation**  
  . . . ion cyclotron radiation  
RT charged particles  
Larmor precession  
Larmor radius  
∞ radiation
- cyclotron resonance**  
DEF Energy transfer to charged particles in a magnetic field from an alternating-current electric field whose frequency is equal to the cyclotron frequency.  
GS resonance  
  . **cyclotron resonance**  
  . . electron cyclotron resonance  
RT charged particles  
diamagnetism  
energy transfer  
Fermi surfaces  
ion cyclotron radiation  
plasma resonance
- cyclotron resonance devices**  
DEF Microwave amplifiers based on the interaction between electromagnetic waves and transverse electron streams moving along helical trajectories. Used for gyrotrons.  
UF *gyrotrons*  
GS amplifiers  
  . microwave amplifiers  
  . . **cyclotron resonance devices**  
  . electron tubes  
  . vacuum tubes  
  . . microwave tubes  
  . . . **cyclotron resonance devices**  
  . microwave equipment  
  . . microwave amplifiers  
  . . **cyclotron resonance devices**  
  . microwave tubes  
  . . **cyclotron resonance devices**  
RT cavity resonators  
∞ devices  
diffraction radiation  
electron cyclotron resonance  
klystrons  
millimeter waves  
power amplifiers
- traveling wave tubes
- cyclotrons**  
UF *calutrons*  
GS particle accelerators  
  . **cyclotrons**  
  . . geocyclotrons  
  . . microtrons  
  . . Oak Ridge isochronous cyclotron  
  . . omegatrons  
  . . synchrocyclotrons  
RT synchrotrons
- Cygnus constellation**  
GS constellations  
  . **Cygnus constellation**  
RT celestial bodies  
celestial sphere  
stars
- ∞ **cylinders**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT analytic geometry  
circular cylinders  
concentric cylinders  
cylindrical bodies  
cylindrical chambers  
cylindrical shells  
∞ drums  
drums (containers)  
elastic cylinders  
elliptical cylinders  
hemisphere cylinder bodies  
monocoque structures  
orthotropic cylinders  
oscillating cylinders  
plasma cylinders  
rotating cylinders  
viscoelastic cylinders
- cylindrical afterbodies*  
USE **afterbodies**  
**cylindrical bodies**
- cylindrical antennas**  
GS antennas  
  . **cylindrical antennas**  
RT antenna radiation patterns  
radio equipment
- cylindrical bodies**  
UF *cylindrical afterbodies*  
*cylindroids*  
GS symmetrical bodies  
  . bodies of revolution  
  . . **cylindrical bodies**  
  . . . rotating cylinders  
RT afterbodies  
Airy function  
centerbodies  
circular cylinders  
∞ cylinders  
cylindrical coordinates  
elastic cylinders  
elliptical cylinders  
forebodies  
fuselages  
hemisphere cylinder bodies  
orthotropic cylinders  
oscillating cylinders  
plasma cylinders  
plastic bodies  
rollers  
viscoelastic cylinders
- cylindrical chambers**  
RT brakes (for arresting motion)  
∞ chambers  
∞ cylinders
- cylindrical coordinates**  
GS coordinates  
  . **cylindrical coordinates**  
RT astronomical coordinates  
Cartesian coordinates  
cylindrical bodies
- cylindrical plasmas**  
DEF Magnetic self-attraction of parallel

## cylindrical shells

electric currents causing constriction of a conducting plasma through which a large current is flowing.

- GS particles
  - . charged particles
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **cylindrical plasmas**
  - . corpuscular radiation
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **cylindrical plasmas**
  - plasma cylinders
  - . **cylindrical plasmas**
- RT pinch effect

### cylindrical shells

- GS shells (structural forms)
  - . **cylindrical shells**
- RT circular cylinders
- circular shells
- circular tubes
- concentric cylinders
- ∞ cylinders
  - elastic cylinders
  - elliptical cylinders
  - metal shells
  - orthotropic cylinders
  - orthotropic shells
  - oscillating cylinders
  - plasma cylinders
  - plastic shells
  - reinforced shells
  - rotating cylinders
  - thin walled shells
  - viscoelastic cylinders

### cylindrical tanks

- GS tanks (containers)
  - . **cylindrical tanks**
- RT fuel tanks
- propellant tanks
- storage tanks

### cylindrical waves

- DEF Waves in which the wave fronts are coaxial cylinders.
- RT axisymmetric flow
- elastic waves
- electromagnetic radiation
- plane waves
- spherical waves
- ∞ waves

### cylindroids

- USE **cylindrical bodies**

### Cyprus

- GS landforms
  - . islands
  - . . **Cyprus**
- nations
  - . **Cyprus**
- RT Greece
- Mediterranean Sea

### Cyrillid meteoroids

- GS celestial bodies
  - . meteoroid showers
  - . . **Cyrillid meteoroids**
  - . meteoroids
  - . . bolides
  - . . . **Cyrillid meteoroids**
- RT natural satellites
- tektites

### cysteamine

- GS drugs
  - . antiradiation drugs
  - . . **cysteamine**
- organic compounds
  - . amines
  - . . **cysteamine**

- RT amino acids
- proteins
- radiation protection

### cysteine

- GS acids
  - . amino acids
  - . . **cysteine**
- drugs
  - . **cysteine**
- organic compounds
  - . amino acids
  - . . **cysteine**
- sulfur compounds
  - . thiols
  - . . **cysteine**
- RT proteins

### cystic fibrosis

- GS diseases
  - . fibrosis
  - . . **cystic fibrosis**
- RT tissues (biology)

### cysts

- GS **cysts**
  - . mucocoeles
- RT neoplasms
- tissues (biology)
- tumors

### cytidylic acid

- GS acids
  - . **cytidylic acid**
- organic compounds
  - . cyclic compounds
  - . . heterocyclic compounds
  - . . . **cytidylic acid**

### cytochromes

- GS biopolymers
  - . proteins
  - . . enzymes
  - . . . **cytochromes**
- organic compounds
  - . proteins
  - . . enzymes
  - . . . **cytochromes**
- pigments
  - . **cytochromes**
- RT cyto genesis
- skin (anatomy)

### cytogenesis

- GS **cytogenesis**
  - . cell division
  - . differentiation (biology)
  - . hematopoiesis
  - . mitosis
  - . osteogenesis
- RT ∞ biology
- cells (biology)
- cytochromes
- cytology
- cytoplasm
- ∞ differentiation
  - genetics
  - heredity
  - osteoblasts
  - physiology

### cytology

- UF *cell physiology*
- RT animal models
- apoptosis
- biochemistry
- biological diversity
- ∞ biology
  - blood cell count
  - cell membranes (biology)
  - cells (biology)
  - chromatin
  - chromosomes

- clone cells
- cytogenesis
- cytometry
- eukaryotes
- in vitro methods and tests
- in vivo methods and tests
- lysosomes
- mitochondria
- mitosis
- monocytes
- necrosis
- nuclei (cytology)
- organelles
- plasmolysis
- plastids
- prokaryotes
- sarcoplasmic reticulum
- stem cells
- tissue engineering

### cytometry

- (added February 1990)
- UF *cytophotometry*
- RT cells (biology)
- cytology
- microscopy

### cytophotometry

- USE **cytometry**

### cytoplasm

- RT calmodulin
- cells (biology)
- chloroplasts
- cytogenesis
- endoplasmic reticulum
- eosinophils
- fibroblasts
- mitosis
- neutrophils
- nuclei (cytology)
- organelles
- plastids
- ribosomes
- sarcoplasmic reticulum

### Czech Republic

- (added December 1995)
- GS nations
  - . **Czech Republic**
- RT Czechoslovakia
- Europe
- Slovakia

### Czechoslovakia

- GS nations
  - . **Czechoslovakia**
- RT Central Europe
- Czech Republic
- Czechoslovakian space program
- Czechoslovakian spacecraft
- Europe
- Slovakia

### Czechoslovakian space program

- (added March 1989)
- GS programs
  - . space programs
  - . . European space programs
  - . . . **Czechoslovakian space program**
- RT Czechoslovakia

### Czechoslovakian spacecraft

- DEF Spacecraft of Czechoslovakia.
- RT Czechoslovakia
- ∞ spacecraft

### Czoehrsalski method

- GS growth
  - . crystal growth
  - . . **Czoehrsalski method**
- RT ∞ methodology
- Verneuil process

# D

*D layer*  
USE **D region**

**D lines**  
GS spectra  
  . radiation spectra  
  . . . electromagnetic spectra  
  . . . line spectra  
  . . . . **D lines**  
RT absorption spectra  
  emission spectra  
  H lines  
  solar spectra

**D region**  
SN (ALTITUDE RANGE BETWEEN APPROXIMATELY 50 AND 90 KM)  
UF *D layer*  
GS Earth atmosphere  
  . upper atmosphere  
  . . Earth ionosphere  
  . . . lower ionosphere  
  . . . . **D region**  
  regions  
  . **D region**  
RT Earth-ionosphere waveguide

**D-1 satellite**  
GS artificial satellites  
  . French satellites  
  . . **D-1 satellite**

**D-2 satellites**  
UF *D-2B satellite*  
  *Polaire satellite*  
  *Tournesole satellite*  
GS artificial satellites  
  . French satellites  
  . . **D-2 satellites**  
  . meteorological satellites  
  . . **D-2 satellites**

*D-2B satellite*  
USE **D-2 satellites**

**D-558 aircraft**  
UF *Douglas D-558 aircraft*  
  *Skyrocket aircraft*  
  *Skystreak aircraft*  
GS jet aircraft  
  . **D-558 aircraft**  
  McDonnell Douglas aircraft  
  . Douglas aircraft  
  . . **D-558 aircraft**  
  monoplanes  
  . **D-558 aircraft**  
  research vehicles  
  . research aircraft  
  . . **D-558 aircraft**  
  supersonic aircraft  
  . **D-558 aircraft**  
RT ∞ aircraft

**Dacron (trademark)**  
GS fabrics  
  . **Dacron (trademark)**  
  fibers  
  . synthetic fibers  
  . . **Dacron (trademark)**  
RT polyester resins  
  reinforcing fibers

*Dactyl*  
USE **natural satellites**

*DAD Explorer*  
USE **Dual Air Density Explorer**

*DAEMO (data analysis)*  
USE **data processing**  
  **data reduction**  
  **data transmission**

*Dahomey*  
USE **Benin**

*Dakota aircraft*  
USE **C-47 aircraft**

**Dalton law**  
DEF The empirical generalization that for

many so-called perfect gases, a mixture of these gases will have a pressure equal to the sum of the partial pressures that each of the gases would have as a sole component with the same volume and temperature, provided there is no chemical interaction.  
RT gas composition  
  gas dynamics  
  gas-gas interactions  
  ideal gas  
  partial pressure  
  vapor pressure

**DAMA**  
USE **demand assignment multiple access**

**damage**  
GS **damage**  
  . cumulative damage  
  . earthquake damage  
  . fire damage  
  . flood damage  
  . frost damage  
  . impact damage  
  . . meteoritic damage  
  . . rain impact damage  
  . proton damage  
  . radiation damage  
  . . laser damage  
  . storm damage  
RT burnthrough (failure)  
  corrosion  
  damage assessment  
  decay  
  decomposition  
  defects  
  deformation  
  degradation  
  destruction  
  deterioration  
  discoloration  
  disintegration  
  durability  
  fatigue (biology)  
  fatigue (materials)  
  fractures (materials)  
  hot corrosion  
  immobilization  
  impairment  
  injuries  
  lethality  
  losses  
  radiation effects  
  sabotage  
  space weathering  
  warpage  
  wear  
  weathering

**damage assessment**  
DEF Estimate of injury or loss to components, subsystems, or entire systems, as well as the cost of repairs or replacement to restore serviceability.  
GS assessments  
  . **damage assessment**  
RT casts  
  costs  
  damage  
  estimates  
  maintenance  
  recoverability  
  replacing  
  spare parts  
  structural health monitoring  
  value

*damage threshold*  
USE **yield point**

**Damkohler number**  
RT activation energy  
  combustion physics  
  diffusion flames  
  flame propagation  
∞ numbers

reaction kinetics

**DAMP program**  
USE **Downrange Antimissile Measurement Program**

∞ **dampers**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT blankets (fission reactors)  
  dampers (valves)  
  nutaton dampers  
  oscillation dampers  
  vibration isolators

**dampers (valves)**  
GS valves  
  . butterfly valves  
  . . **dampers (valves)**  
RT automatic control valves  
∞ dampers  
  gas valves  
  vibration isolators

**damping**  
DEF The suppression of oscillations or disturbances; the dissipation of energy with time. Used for damping factor, damping in pitch, damping in roll, damping in yaw, elastic stability, and jet damping.  
UF *damping factor*  
  *damping in pitch*  
  *damping in roll*  
  *damping in yaw*  
  *elastic stability*  
  *jet damping*  
GS **damping**  
  . elastic damping  
  . . viscoelastic damping  
  . Landau damping  
  . vibration damping  
  . viscous damping  
  . . viscoelastic damping  
  . magnetic damping  
RT ∞ absorption  
  attenuation  
  baffles  
  deceleration  
  dissipation  
  dynamic characteristics  
  dynamic response  
  dynamic stability  
  energy absorption  
  gyroscope fluids  
  gyroscopic pendulums  
  gyroscopic stability  
  hysteresis  
  impedance  
  insulation  
  internal friction  
  mechanical impedance  
  mufflers  
  negative feedback  
  oscillations  
∞ reduction  
∞ resistance  
∞ resonant frequencies  
  resonant vibration  
  retarding  
  roll  
  sea keeping  
  shock absorbers  
  silencers  
  stability derivatives  
  stopping  
  subharmonic generators  
  suppressors  
  time constant  
  transfer functions  
  transient oscillations  
  transient response  
  vibration isolators

## damping tests

wave interaction

*damping factor*

USE **damping**

*damping in pitch*

USE **damping pitch (inclination)**

*damping in roll*

USE **damping**

*damping in yaw*

USE **damping yaw**

### damping tests

- GS vibration tests
  - . **damping tests**
  - . . stroking tests
- RT resonance testing
- stability tests
- ∞ tests
- vibration measurement

*dampness*

USE **moisture content**

### dams

- RT ∞ barrages
- ∞ barriers
- flood control
- hydroelectricity
- reservoirs
- wharves

*danger*

USE **hazards**

### Danish space program

(added August 1990)

- GS programs
  - . space programs
  - . . European space programs
  - . . . **Danish space program**
- RT Denmark

### dark adaptation

DEF The process by which the iris and retina of the eye adjust to allow maximum vision in dim illumination, following exposure of the eye to a relatively brighter illumination.

- GS adaptation
  - . retinal adaptation
  - . . **dark adaptation**
- RT darkness
- night vision
- pupillometry
- vision
- visual pigments

### dark current

(added October 1997)

- UF *electrode dark current*
- GS electric current
  - . **dark current**
- RT low currents
- photocathodes
- photodiodes
- photoelectric cells
- phototubes
- signal to noise ratios

### dark energy

(added February 2004)

DEF A hypothetical form of energy that permeates all of space and is believed to be responsible for accelerating the expansion of the Universe.

- RT astrophysics
- cosmology
- dark matter
- ∞ energy
- gravitation theory
- universe

### dark matter

- GS extraterrestrial matter
  - . interstellar matter
  - . . **dark matter**
  - matter (physics)

### . dark matter

- RT Alpha Magnetic Spectrometer
- baryons
- cooling flows (astrophysics)
- cosmology
- dark energy
- galactic evolution
- galactic halos
- intergalactic media
- large-scale structure of the universe
- massive compact halo objects
- missing mass (astrophysics)
- neutrinos
- Population III stars
- universe
- weakly interacting massive particles

### darkening

- GS **darkening**
  - . limb darkening
- RT darkness
- ∞ illumination
- night
- visibility

### darkness

- RT color
- dark adaptation
- darkening
- diurnal variations
- illuminating
- ∞ illumination
- light (visible radiation)
- night
- night flights (aircraft)
- optical properties
- shadows
- zeitgebers

### darkrooms

- GS rooms
  - . **darkrooms**
- RT photographic processing
- photographic processing equipment
- photography

*Darkstar unmanned aerial vehicle*

(added August 1998)

USE **pilotless aircraft reconnaissance aircraft**

*Dart turboprop engines*

USE **turboprop engines**

*Dash helicopter*

USE **QH-50 helicopter**

### Dassault aircraft

- GS **Dassault aircraft**
  - . Mirage aircraft
  - . . Mirage 3 aircraft
  - . Mystere 20 aircraft
  - . Mystere 50 aircraft
- RT ∞ aircraft

*Dassault Mirage 3 aircraft*

USE **Mirage 3 aircraft**

*Dassault Mystere 20 aircraft*

USE **Mystere 20 aircraft**

*Dassault Mystere 50 aircraft*

USE **Mystere 50 aircraft**

### DAST program

SN (DRONES FOR AERODYNAMIC AND STRUCTURAL TESTING)

DEF A NASA program which uses the Firebee 2 target drone aircraft as a test bed for getting flight data on research wings. The drone is launched from the wing of a B52 and recovered by parachute. The program's purpose is the study of flight loads and load control. Used for drones for aerodynamic and struct test.

UF *Drones for Aerodynamic and Structural Test*

- GS programs
  - . NASA programs
  - . . **DAST program**
- RT aeroelasticity
- aircraft control

aircraft design

drone aircraft

flight tests

flutter

remotely piloted vehicles

vibration damping

### ∞ data

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

- RT analog data
- audio data
- binary data
- biomedical data
- censored data (mathematics)
- channels (data transmission)
- control data (computers)
- data acquisition
- data base management systems
- data bases
- data collection platforms
- data compression
- data conversion routines
- data converters
- data correlation
- data links
- data management
- data processing
- data processing equipment
- data processing terminals
- data recorders
- data recording
- data reduction
- data retrieval
- data sampling
- data smoothing
- data storage
- data systems
- data transmission
- datum (elevation)
- digital data
- end-to-end data systems
- information
- interservice data exchange program
- ∞ measurement
- metadata
- ocean data acquisitions systems
- onboard data processing
- optical data processing
- optical data storage materials
- optical memory (data storage)
- printers (data processing)
- radar data
- records
- site data processors
- Space Flight Tracking and Data Network
- statistical analysis
- statistical tests
- ∞ statistics
- tables (data)
- video data
- voice data processing
- weather data recorders
- world data centers

### data acquisition

- GS acquisition
  - . **data acquisition**
- RT Advanced Range Instrumentation Aircraft
- Alouette project
- analog to digital converters
- automatic weather stations
- counting
- ∞ data
- Deep Space Instrumentation Facility
- detection
- Earth observations (from space)
- end-to-end data systems
- forms (paper)
- Global Tracking Network
- ground stations
- infrared radiometers
- meteorological research aircraft
- needs (data system)
- news media
- observation
- ocean data acquisitions systems

optical data processing  
 optical scanners  
 remote sensors  
 ∞ sensors  
 Space Flight Tracking and Data Network  
 STDN (network)  
 surveys  
 tables (data)  
 tracking networks

*data adaptive evaluator/monitor*

USE **data processing**  
**data reduction**  
**data transmission**

*data analysis*

USE **data processing**  
**data reduction**

**data base management systems**

DEF Software products that control data structures containing interrelated data stored so as to optimize accessibility and control, minimize redundancy, and offer multiple views of the data to various applications programs.

RT ∞ data  
 data bases  
 data management  
 information management  
 management information systems  
 relational data bases  
 ∞ systems

**data bases**

GS **data bases**  
 . knowledge bases (artificial intelligence)  
 . numerical data bases  
 . relational data bases

RT ∞ bases  
 CD-ROM  
 ∞ data  
 data base management systems  
 data structures  
 metadata  
 software engineering

*data busses*

USE **channels (data transmission)**

**data collection platforms**

RT Argos system  
 automatic weather stations  
 ∞ data  
 ground stations  
 instrument packages  
 integrated global ocean station systems  
 ∞ platforms  
 remote sensors

*data compaction*

USE **data compression**

**data compression**

DEF Any technique used to reduce the amount of storage required to store data.

UF *data compaction*  
 GS **data compression**  
 . video compression

RT curve fitting  
 ∞ data  
 decoding  
 discrete cosine transform  
 Fourier analysis  
 telecommunication  
 telemetry  
 vector quantization

**data conversion routines**

GS **data conversion routines**  
 . subroutines

RT algorithms  
 compilers  
 computer programs  
 ∞ conversion  
 ∞ data

∞ routines

**data converters**

GS **data converters**  
 . analog to digital converters  
 . binary to decimal converters  
 . decimal to binary converters  
 . digital to analog converters

RT analog circuits  
 analog data  
 computers  
 conversion tables  
 ∞ converters  
 ∞ data  
 decoders  
 digital data  
 transducers  
 video data

**data correlation**

GS correlation  
 . **data correlation**  
 data processing  
 . **data correlation**  
 RT angular correlation  
 autocorrelation  
 cross correlation  
 ∞ data  
 statistical analysis  
 statistical correlation  
 teleconnections (meteorology)  
 temperature ratio

**data flow analysis**

RT computer programs  
 computer systems programs  
 data simulation  
 data transfer (computers)  
 flow charts  
 network analysis  
 sequential control

*data fusion*

USE **multisensor fusion**

*data handling systems*

USE **data systems**

**data integration**

DEF Taking data from multiple sources and merging the data into a single data file.

RT data management  
 data simulation  
 multisensor fusion

**data links**

DEF Communications channels or circuits used to transmit data from a sensor to a computer; a readout device or a storage device.

GS telecommunication  
 . **data links**  
 RT channels (data transmission)  
 communication networks

∞ data  
 decommutators  
 discrete address beacon system  
 frequency reuse

∞ links  
 networks  
 protocol (computers)  
 radio receivers  
 radio relay systems  
 remote consoles  
 site data processors  
 telemetry  
 VSAT (network)  
 wireless communication

**data management**

GS management  
 . **data management**  
 RT ∞ data  
 data base management systems  
 data integration  
 data simulation  
 frames (data processing)  
 information resources management  
 metadata  
 on-line systems  
 records management

relational data bases  
 surveys  
 tables (data)  
 virtual memory systems

**data mining**

(added April 2000)

DEF The extraction of patterns from large data sets in order to discover previously unknown and potentially useful information.

UF *knowledge discovery*  
*knowledge extraction*

GS data processing  
 . **data mining**  
 information analysis

RT . **data mining**  
 cluster analysis  
 data retrieval  
 machine learning  
 trend analysis

**data processing**

SN (LIMITED TO MECHANICAL OR ELECTRONIC MANIPULATION OF DATA)

DEF Application of procedures, mechanical, electrical, computational, or other whereby data are changed from one form to another. Used for automatic data processing, DAEMO (data analysis), data adaptive evaluator/monitor, and data analysis.

UF *automatic data processing*  
*DAEMO (data analysis)*  
*data adaptive evaluator/monitor*  
*data analysis*

GS **data processing**

. associative processing (computers)  
 . batch processing  
 . censored data (mathematics)  
 . Central Electronic Management System  
 . concurrent processing  
 . data correlation  
 . data reduction  
 . . data smoothing  
 . data retrieval  
 . data storage  
 . data transfer (computers)  
 . distributed processing  
 . . grid computing (computer networks)

. Karhunen-Loeve expansion  
 . multiprocessing (computers)  
 . onboard data processing  
 . optical data processing  
 . parallel processing (computers)  
 . pipelining (computers)  
 . scene analysis  
 . signal analysis  
 . . cepstral analysis  
 . signal processing  
 . . space-time adaptive processing  
 . vector processing (computers)  
 . voice data processing  
 . . cepstral analysis  
 . data mining

RT access time  
 adjoints  
 airborne/spaceborne computers  
 analog data  
 Atmospheric & Oceanographic Inform Sys

∞ automation  
 binary data  
 binary to decimal converters  
 bubble memory devices  
 channels (data transmission)  
 computation  
 computer information security  
 computer programs  
 computer systems programs  
 computers

∞ data  
 data products  
 data structures  
 decimal to binary converters  
 digital computers  
 digital data  
 editing  
 editing routines (computers)  
 end-to-end data systems



## data processing equipment

- fixed point arithmetic
- floating point arithmetic
- frames (data processing)
- image processing
- information resources management
- information retrieval
- information theory
- interrogation
- language programming
- mechanization
- microprocessors
- natural language (computers)
- needs (data system)
- on-line systems
- peripheral equipment (computers)
- preprocessing
- ∞ processing
- protocol (computers)
- RCA computers
- records
- response time (computers)
- site data processors
- symbols
- systems engineering
- tables (data)
- tabulation processes
- telecommunication
- word processing

### data processing equipment

DEF Machines for handling information in a sequence of reasonable operations. Used for data processors.

UF *data processors*

#### GS data processing equipment

- . computers
  - . analog computers
  - . . . EAI 680 computer
  - . . . Honeywell 600/6000 computer
  - . . . SIGMA 5 computer
  - . . . Univac 1100 series computers
    - . . . . Univac 1105 computer
    - . . . . Univac 1106 computer
    - . . . . Univac 1107 computer
    - . . . . Univac 1108 computer
    - . . . . Univac 1110 computer
  - . . CDC computers
    - . . . CDC 160-A computer
    - . . . CDC 1604 computer
    - . . . CDC 3100 computer
    - . . . CDC 3200 computer
    - . . . CDC 3600 computer
    - . . . CDC 3800 computer
    - . . . CDC 6000 series computers
      - . . . . CDC 6400 computer
      - . . . . CDC 6600 computer
      - . . . . CDC 6700 computer
    - . . . CDC 7000 series computers
      - . . . . CDC 7600 computer
    - . . . CDC 8090 computer
    - . . . CDC Cyber 170 series computers
      - . . . . CDC Cyber 175 computer
      - . . . . CDC Cyber 74 computer
      - . . . . CDC Cyber 174 computer
      - . . . . CDC Cyber 203 computer
      - . . . . CDC Cyber 205 computer
      - . . . . CDC Star 100 computer
  - . . counting rate computers
  - . . DDP computers
    - . . . DDP 516 computer
  - . . digital computers
    - . . . CDC 160-A computer
    - . . . CDC 1604 computer
    - . . . CDC 3100 computer
    - . . . CDC 3200 computer
    - . . . CDC 3600 computer
    - . . . CDC 3800 computer
    - . . . CDC 6000 series computers
      - . . . . CDC 6400 computer
      - . . . . CDC 6600 computer
      - . . . . CDC 6700 computer
    - . . . CDC 7000 series computers
      - . . . . CDC 7600 computer
    - . . . CDC 8090 computer
    - . . . CDC Cyber 170 series computers
      - . . . . CDC Cyber 175 computer
      - . . . . CDC Cyber 74 computer
      - . . . . CDC Cyber 174 computer
      - . . . . CDC Cyber 203 computer

- . . . CDC Cyber 205 computer
- . . . CDC Star 100 computer
- . . . EAI 680 computer
- . . . EAI 8400 computer
- . . . EAI 8900 computer
- . . . EMR 6050 computer
- . . . Ferranti Mercury computer
- . . . GE computers
  - . . . . GE 625 computer
  - . . . . GE 635 computer
- . . . Hewlett-Packard computers
- . . . Honeywell computers
  - . . . . DDP 516 computer
  - . . . . Honeywell 600/6000 computer
  - . . . . Honeywell ADEPT computer
  - . . . . Honeywell DDP 116 computer
- . . . IBM 360 computer
- . . . IBM 370 computer
- . . . IBM 650 computer
- . . . IBM 704 computer
- . . . IBM 709 computer
- . . . IBM 1130 computer
- . . . IBM 1401 computer
- . . . IBM 1410 computer
- . . . IBM 1620 computer
- . . . IBM 2250 computer
- . . . IBM 7030 computer
- . . . IBM 7040 computer
- . . . IBM 7044 computer
- . . . IBM 7070 computer
- . . . IBM 7074 computer
- . . . IBM 7090 computer
- . . . IBM 7094 computer
- . . . ICL computers
- . . . Illiac computers
  - . . . . Illiac 3 computer
  - . . . . Illiac 4 computer
- . . . microcomputers
  - . . . . personal computers
    - . . . . . IBM personal computers
    - . . . . . Macintosh personal computers
  - . . . . minicomputers
    - . . . . . Nova computers
    - . . . . . Modcomp II computer
    - . . . . . Modcomp IV computer
  - . . . . parallel computers
    - . . . . . massively parallel processors
      - . . . . . . Connection Machine
    - . . . . . MIMD (computers)
    - . . . . . SIMD (computers)
  - . . . . PDP 15 computer
  - . . . . PDP computers
    - . . . . . PDP 7 computer
    - . . . . . PDP 8 computer
    - . . . . . PDP 9 computer
    - . . . . . PDP 10 computer
    - . . . . . PDP 11 computer
    - . . . . . PDP 11/20 computer
    - . . . . . PDP 11/40 computer
    - . . . . . PDP 11/45 computer
    - . . . . . PDP 11/50 computer
    - . . . . . PDP 11/70 computer
    - . . . . . PDP 12 computer
  - . . . . Philco 2000 computer
  - . . . . Raytheon computers
  - . . . . RCA spectra 70 computer
  - . . . . SDS 900 series computers
  - . . . . SDS 930 computer
  - . . . . SDS 9300 computer
  - . . . . SEL computers
  - . . . . sequential computers
  - . . . . SIGMA 5 computer
  - . . . . SIGMA computers
    - . . . . . SIGMA 9 computer
  - . . . . Solomon computers
    - . . . . . Univac 1100 series computers
      - . . . . . . Univac 1105 computer
      - . . . . . . Univac 1106 computer
      - . . . . . . Univac 1107 computer
      - . . . . . . Univac 1108 computer
      - . . . . . . Univac 1110 computer
    - . . . . . . Univac 80 computer
    - . . . . . . Univac 418 computer
    - . . . . . . Univac 490 computer
    - . . . . . . Univac 494 computer
    - . . . . . . Univac Larc computer
  - . . . . VAX computers
  - . . . . VAX-11 series computers

- . . . . VAX-11/780 computer
- . . embedded computer systems
- . . . airborne/spaceborne computers
- . . hybrid computers
- . . hypercube multiprocessors
- . . IBM computers
  - . . . IBM 360 computer
  - . . . IBM 370 computer
  - . . . IBM 650 computer
  - . . . IBM 704 computer
  - . . . IBM 709 computer
  - . . . IBM 1130 computer
  - . . . IBM 1401 computer
  - . . . IBM 1410 computer
  - . . . IBM 1620 computer
  - . . . IBM 2250 computer
  - . . . IBM 7030 computer
  - . . . IBM 7040 computer
  - . . . IBM 7044 computer
  - . . . IBM 7070 computer
  - . . . IBM 7074 computer
  - . . . IBM 7090 computer
  - . . . IBM 7094 computer
- . . IBM personal computers
- . . MINOS computer
- . . optical computers
- . . Pegasus computer
- . . RCA computers
  - . . . RCA spectra 70 computer
  - . . . RCA-110 computers
  - . . . Siemens 2002 computer
- . . site data processors
- . . supercomputers
  - . . . Connection Machine
  - . . . Cray computers
  - . . . transputers
  - . . . Univac computers
    - . . . . Univac 1100 series computers
      - . . . . . Univac 1105 computer
      - . . . . . Univac 1106 computer
      - . . . . . Univac 1107 computer
      - . . . . . Univac 1108 computer
      - . . . . . Univac 1110 computer
    - . . . . Univac 80 computer
    - . . . . Univac 418 computer
    - . . . . Univac 490 computer
    - . . . . Univac 494 computer
    - . . . . Univac 1230 computer
    - . . . . Univac Larc computer
  - . . . quantum computers
  - . . data processing terminals
    - . . . VSAT (network)
  - . . microprocessors
    - . . . Intel 8080 microprocessor
  - . . peripheral equipment (computers)
  - . . printers (data processing)
  - . . remote consoles
- RT batch processing
- computer compatible tapes
- computer systems simulation
- control units (computers)
- ∞ data
- digital radar systems
- ∞ equipment
- interfaces
- multiprocessing (computers)
- optical data processing
- pipelining (computers)
- printers
- simulation

### data processing terminals

- GS data processing equipment
  - . **data processing terminals**
    - . . VSAT (network)
- RT computer graphics
  - consoles
- ∞ data
  - human-computer interface
  - man machine systems
  - remote consoles
- ∞ terminals

*data processors*

USE **data processing equipment**

### data products

(added June 2005)

DEF Processed data from the same source,

normally compiled into a set according to shared characteristics.

- GS products
  - . **data products**
- RT Aqua spacecraft
  - Aura spacecraft
  - CERES (experiment)
  - data processing
  - Earth Observing System (EOS)
  - image processing
  - Landsat satellites
  - MISR (radiometry)
  - MODIS (radiometry)
  - remote sensing
  - remote sensors
  - satellite imagery
  - satellite-borne instruments
  - space commercialization
  - Surface Meteorology and Solar Energy project
  - Surface Radiation Budget project
  - technology utilization
  - Terra spacecraft
  - thematic mapping

*data readout systems*

- USE **data systems**
- display devices**

**data recorders**

- GS **data recorders**
  - . flight recorders
  - . . flight load recorders
  - . weather data recorders
- RT bubble memory devices
  - bubble technique
  - counters
- ∞ data
  - display devices
  - monitors
  - punched cards
- ∞ recorders
  - recording instruments
  - tape recorders
  - video disks

**data recording**

- GS recording
  - . **data recording**
- RT bubble memory devices
  - ∞ data
    - magnetic recording
    - magnetic storage
    - optical data storage materials
    - photographic recording
    - punched cards
    - punched tapes
    - recording heads
    - records
    - tables (data)
    - tabulation processes
    - video disks

**data reduction**

DEF Transformation of observed values into useful, ordered, or simplified information. Used for DAEMO (data analysis), data adaptive evaluator/monitor, data analysis, and TARE (data reduction).

- UF *DAEMO (data analysis)*
  - data adaptive evaluator/monitor*
  - data analysis*
  - TARE (data reduction)*
- GS data processing
  - . **data reduction**
  - . . data smoothing
- RT computation
  - ∞ data
    - editing
    - preprocessing
  - ∞ reduction
    - tables (data)

**data retrieval**

- GS data processing
  - . **data retrieval**
  - retrieval
    - . **data retrieval**
- RT ∞ data
  - data mining

- data transfer (computers)
- documentation
- information management
- information retrieval
- interservice data exchange program
- libraries
- management information systems
- microfilms
- relational data bases
- search profiles
- tables (data)
- telemetry
- world data centers

**data sampling**

- GS sampling
  - . **data sampling**
- RT computer systems performance
  - ∞ data
    - quality control
    - sampled data systems
    - telecommunication
    - time series analysis

**data simulation**

DEF The use of statistical or physical models to produce synthetic data for testing purposes.

- GS simulation
  - . **data simulation**
- RT data flow analysis
  - data integration
  - data management

**data smoothing**

DEF The mathematical process of fitting a smooth curve to dispersed data points.

- GS data processing
  - . data reduction
  - . . **data smoothing**
  - recording
    - . **data smoothing**
    - smoothing
    - . **data smoothing**
- RT curve fitting
  - ∞ data

**data storage**

- GS data processing
  - . **data storage**
- RT bubble memory devices
  - buffer storage
  - cards
  - core storage
  - ∞ data
    - data transfer (computers)
    - document storage
    - flip-flops
    - holography
    - information management
    - interservice data exchange program
    - magnetic storage
    - management information systems
    - microfilms
    - microphotographs
    - optical data storage materials
    - optical disks
    - punched cards
    - selective dissemination of information
  - ∞ storage
    - video disks
    - virtual memory systems
    - white light holography
    - world data centers

**data structures**

DEF The organization of computer memory used to represent information in a computer program or database.

- RT computer programming
  - data bases
  - data processing
  - knowledge based systems
  - structured programming

**data systems**

- UF *data handling systems*
  - data readout systems*
- GS **data systems**
  - . air data systems

- . needs (data system)
- RT Atmospheric & Oceanographic Inform Sys
  - control data (computers)
- ∞ data
  - data transfer (computers)
  - digital systems
  - Earth Resources Information System
  - end-to-end data systems
  - geographic information systems
  - management information systems
  - ∞ systems

**data transfer (computers)**

DEF The technique used by the hardware manufacturer to transmit data from computer to storage device or from storage device to computer, usually under specialized program control.

- GS data processing
  - . **data transfer (computers)**
- RT asynchronous transfer mode
  - computer programs
  - data flow analysis
  - data retrieval
  - data storage
  - data systems
  - data transmission
  - input/output routines
  - interoperability

**data transmission**

- UF *DAEMO (data analysis)*
  - data adaptive evaluator/monitor*
  - information transmission*
- GS transmission
  - . signal transmission
  - . . **data transmission**
  - . . . automatic picture transmission
  - . . . multiple access
    - . . . . Aloha system
    - . . . . carrier sense multiple access
    - . . . . code division multiple access
    - . . . . demand assignment multiple access
    - . . . . frequency division multiple access
    - . . . . time division multiple access
  - . . . packet transmission
    - . . . . Aloha system
    - . . . single channel per carrier transmission
- RT access control
  - Argos system
  - asynchronous transfer mode
  - audio data
  - automatic repeat request
  - carrier to noise ratios
  - channels (data transmission)
  - code division multiplexing
  - coding
  - communication theory
  - concatenated codes
  - ∞ data
    - data transfer (computers)
    - Deep Space Instrumentation Facility
    - electronic mail
    - FM/PM (modulation)
    - frequency division multiplexing
    - information theory
    - intersymbolic interference
    - laser applications
    - local area networks
    - modems
    - multiplexing
    - packet switching
    - packets (communication)
    - protocol (computers)
    - pulse communication
    - radio telemetry
    - radio transmission
    - reading
    - redundancy encoding
    - satellite transmission
    - ship to shore communication
    - TDR satellites
    - telecommunication
    - telemetry
    - transmission efficiency

## datum (elevation)

transmission rate (communications)  
video data  
VSAT (network)  
wireless communication

*data visualization*  
USE **scientific visualization**

*dating*  
USE **chronology**  
**time measurement**

**datum (elevation)**  
RT clearances  
contours  
∞ data  
elevation angle  
hypsography  
leveling  
maps  
surveys

**dawn chorus**  
UF *chorus (dawn phenomenon)*  
*chorus phenomenon*  
GS atmospheric radiation  
. **dawn chorus**  
electromagnetic interference  
. radio frequency interference  
. . . electromagnetic noise  
. . . . atmospheric  
. . . . ionospheric  
. . . . . **dawn chorus**  
RT auroras  
magnetic storms  
whistlers

**dawsonite**  
DEF A mineral consisting of aluminum sodium carbonate.  
GS minerals  
. **dawsonite**  
RT aluminum  
sodium  
sodium carbonates

**dayglow**  
GS atmospheric radiation  
. sky radiation  
. . **dayglow**  
electromagnetic radiation  
. light (visible radiation)  
. . sky radiation  
. . . **dayglow**  
RT glare  
light sources  
sky  
solar radiation  
twilight glow  
ultraviolet radiation

**daytime**  
RT diurnal variations  
evening  
morning  
night  
noon  
sky brightness

**DBR lasers**  
(added November 1991)  
UF *distributed Bragg reflector lasers*  
GS electronic equipment  
. solid state devices  
. . solid state lasers  
. . . **DBR lasers**  
stimulated emission devices  
. lasers  
. . solid state lasers  
. . . **DBR lasers**  
RT Bragg angle  
Bragg reflectors  
distributed feedback lasers  
semiconductor lasers

tunable lasers

*DBS (satellites)*  
USE **direct broadcast satellites**

**DC 3 aircraft**  
UF *Douglas DC-3 aircraft*  
GS commercial aircraft  
. **DC 3 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **DC 3 aircraft**  
monoplanes  
. **DC 3 aircraft**  
transport aircraft  
. cargo aircraft  
. . **DC 3 aircraft**  
RT ∞ aircraft

**DC 7 aircraft**  
UF *Douglas DC-7 aircraft*  
GS commercial aircraft  
. **DC 7 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **DC 7 aircraft**  
monoplanes  
. **DC 7 aircraft**  
transport aircraft  
. cargo aircraft  
. . **DC 7 aircraft**  
RT ∞ aircraft  
passenger aircraft

**DC 8 aircraft**  
UF *Douglas DC-8 aircraft*  
GS commercial aircraft  
. **DC 8 aircraft**  
jet aircraft  
. turbofan aircraft  
. . **DC 8 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **DC 8 aircraft**  
monoplanes  
. **DC 8 aircraft**  
passenger aircraft  
. **DC 8 aircraft**  
transport aircraft  
. **DC 8 aircraft**  
RT ∞ aircraft

**DC 9 aircraft**  
UF *Douglas DC-9 aircraft*  
GS commercial aircraft  
. **DC 9 aircraft**  
jet aircraft  
. **DC 9 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **DC 9 aircraft**  
transport aircraft  
. **DC 9 aircraft**  
RT ∞ aircraft  
MD 80 aircraft

**DC 10 aircraft**  
GS commercial aircraft  
. **DC 10 aircraft**  
jet aircraft  
. **DC 10 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **DC 10 aircraft**  
McDonnell aircraft  
. . **DC 10 aircraft**  
passenger aircraft  
. **DC 10 aircraft**  
transport aircraft  
. **DC 10 aircraft**  
RT ∞ aircraft  
turbofan engines

*DC 11 aircraft*  
USE **MD 11 aircraft**

*DC (current)*  
USE **direct current**

**DC generators**  
(added July 1991)

UF *direct current generators*  
GS electric generators  
. direct power generators  
. . **DC generators**  
. . . homopolar generators  
RT ∞ generators  
rotating generators

*DCT (mathematics)*  
USE **discrete cosine transform**

**DDP 516 computer**  
GS data processing equipment  
. computers  
. . DDP computers  
. . . **DDP 516 computer**  
. . digital computers  
. . . Honeywell computers  
. . . . **DDP 516 computer**

**DDP computers**  
GS data processing equipment  
. computers  
. . **DDP computers**  
. . . DDP 516 computer  
RT digital computers

**DDT**  
UF *dichlorodiphenyltrichloroethane*  
GS halogen compounds  
. chlorine compounds  
. . **DDT**  
poisons  
. pesticides  
. . insecticides  
. . . **DDT**

**de Broglie wavelengths**  
GS wavelengths  
. **de Broglie wavelengths**  
RT elementary particles  
mass  
momentum  
Plancks constant  
quantum theory  
velocity  
Wentzel-Kramer-Brillouin method

**de Havilland aircraft**  
GS **de Havilland aircraft**  
. Comet 4 aircraft  
. DH 112 aircraft  
. DH 115 aircraft  
. DH 121 aircraft  
. DH 125 aircraft  
. DHC 2 aircraft  
. DHC 4 aircraft  
. DHC 5 aircraft  
RT ∞ aircraft

*de Havilland DH 106 aircraft*  
USE **Comet 4 aircraft**

*de Havilland DH 112 aircraft*  
USE **DH 112 aircraft**

*de Havilland DH 115 aircraft*  
USE **DH 115 aircraft**

*de Havilland DH 121 aircraft*  
USE **DH 121 aircraft**

*de Havilland DH 125 aircraft*  
USE **DH 125 aircraft**

*de Havilland DHC 4 aircraft*  
USE **DHC 4 aircraft**

*de Havilland DHC 5 aircraft*  
USE **DHC 5 aircraft**

*de Havilland Venom aircraft*  
USE **DH 112 aircraft**

*de Laval nozzles*  
USE **convergent-divergent nozzles**

*deacclimatization*  
USE **acclimatization**

**deactivation**  
UF *inactivation*

RT activation  
passivity  
polarization (charge separation)  
polarization (spin alignment)  
sabotage  
shutdowns

**dead reckoning**  
DEF In navigation, determination of position by advancing a previous known position for courses and distances.  
GS navigation  
. **dead reckoning**  
RT air navigation  
digital navigation  
Doppler navigation  
inertial navigation  
polar navigation  
radar navigation  
radio navigation  
surface navigation

*deadweight*  
USE **static loads**

*deafness*  
USE **auditory defects**

**death**  
RT apoptosis  
casualties  
expiration  
injuries  
life span  
mortality  
necrosis

**Death Valley (CA)**  
GS landforms  
. **Death Valley (CA)**  
valleys  
. **Death Valley (CA)**  
RT arid lands  
California  
desertification  
deserts  
river basins

*Debonair aircraft*  
USE **C-33 aircraft**

**debonding (materials)**  
(added July 1992)  
SN (LIMITED TO THE SEPARATION OF BONDED MATERIALS; NOT TO BE USED FOR THE BREAKUP OF ATOMIC/MOLECULAR BONDS)  
RT anodic stripping  
bonding  
delaminating  
fiber composites  
fiber pushout  
laminates  
matrix materials  
peeling  
reinforcing fibers  
∞ separation

**debris**  
GS **debris**  
. space debris  
RT ejecta  
environment effects  
fragments  
glacial drift  
pollution  
∞ radioactive debris  
scrap  
wastes

*debugging*  
USE **checkout**

**Debye length**  
DEF A theoretical length which describes the maximum separation at which a given electron will be influenced by the electric field of a given positive ion.  
GS distance  
. **Debye length**

RT plasmas (physics)

*Debye temperature*  
USE **specific heat**

**Debye-Huckel theory**  
RT dissociation  
electrolytes  
plasma potentials  
∞ theories

**Debye-Scherrer method**  
RT crystallography  
diffraction  
∞ methodology

**decametric waves**  
GS electromagnetic radiation  
. radio waves  
. . **decametric waves**  
RT coronal holes  
high frequencies  
very high frequencies

**decarbonation**  
GS chemical reactions  
. **decarbonation**  
RT carbonization

**decarboxylation**  
GS chemical reactions  
. **decarboxylation**  
RT carboxylation

**decarburation**  
RT carbon  
carburiizing  
heating  
metal working

**decay**  
DEF Decrease of a radioactive substance because of nuclear emission of alpha or beta particles, positrons, or gamma rays.  
GS **decay**  
. particle decay  
. . neutron decay  
. plasma decay  
. radioactive decay  
. . alpha decay  
. . neutron emission  
. spacecraft glow  
. weak energy interactions  
. . weak interactions (field theory)  
RT beta particles  
biodegradability  
biodegradation  
damage  
degradation  
deterioration  
disintegration  
emission  
gamma rays  
half life  
hot atoms  
nuclear fission  
radiative lifetime

**decay rates**  
GS rates (per time)  
. **decay rates**  
. . electron decay rate

**Decca navigation**  
DEF A long range, ambiguous, two dimensional navigation system using continuous wave transmission to provide hyperbolic lines of position through the radio frequency phase comparison techniques from four transmitters.  
GS navigation  
. radio navigation  
. . hyperbolic navigation  
. . . **Decca navigation**  
RT distance measuring equipment  
loran  
loran C  
loran D  
navigation aids  
Shoran  
solar compasses

surface navigation

**deceleration**  
DEF The act or process of moving, or cause to move, with decreasing speed.  
GS rates (per time)  
. acceleration (physics)  
. . **deceleration**  
. . . spin reduction  
RT angular acceleration  
braking  
damping  
impact  
impact acceleration  
landing loads  
physiological acceleration  
∞ reduction  
retarding  
retrofiring  
retrothrust  
stopping  
tapering  
thrust reversal

*decelerators*  
USE **brakes (for arresting motion)**

**deception**  
RT air defense  
chaff  
electronic countermeasures  
electronic warfare  
optical countermeasures  
simulation

**deciduous trees**  
GS plants (botany)  
. trees (plants)  
. . **deciduous trees**  
RT conifers  
Earth resources  
foliage  
forests  
leaves  
timber identification

**decimal to binary converters**  
GS data converters  
. **decimal to binary converters**  
RT binary data  
binary to decimal converters  
computer components  
data processing

**decimals**  
RT digits  
number theory  
∞ numbers

**decimeter waves**  
GS electromagnetic radiation  
. radio waves  
. . short wave radiation  
. . . microwaves  
. . . . **decimeter waves**  
RT millimeter waves  
planetary radiation  
solar radio emission  
ultrahigh frequencies

*decision aids*  
(added October 1997)  
USE **decision support systems**

*decision elements*  
USE **logical elements**

**decision making**  
RT cognition  
command and control  
contract management  
contract negotiation  
decision support systems  
decisions  
economy  
judgments  
management  
management methods  
management planning  
problem solving

## decision support systems

risk assessment  
risk management  
Starsite program  
systems engineering  
tradeoffs

### decision support systems

(added October 1997)

UF *decision aids*

GS information systems  
. **decision support systems**  
support systems  
. **decision support systems**

RT artificial intelligence  
computer techniques  
decision making  
expert systems  
knowledge based systems  
pilot support systems  
problem solving  
situational awareness

### decision theory

GS **decision theory**  
. statistical decision theory

RT dynamic programming  
expectation  
game theory  
information theory  
martingales  
mathematical models  
operations research  
probability theory  
recommendations  
risk  
scheduling  
statistical analysis  
stochastic processes  
strategy  
∞ synthesis  
systems engineering  
∞ theories

### decisions

RT ∞ commands  
contract management  
decision making  
judgments  
logic circuits  
management  
procurement policy  
project planning  
selection

### decks (floors)

USE **floors**

### declination

DEF Angular distance north or south of the celestial equator; the arc of an hour circle between the celestial equator and a point on the celestial sphere, measured northward or southward from the celestial equator through 90 degrees, and labeled N or S to indicate the direction of measurement.

RT mapping  
navigation

### decoders

DEF Devices for translating electrical signals into predetermined functions. In computer operations, networks or devices in which one of two or more possible outputs results from a prescribed combination of inputs.

GS **decoders**  
. Viterbi decoders  
RT BCH codes  
coders  
data converters  
decoding  
demodulators  
Reed-Solomon codes  
∞ translators

### decoding

GS coding  
. **decoding**  
RT BCH codes  
concatenated codes  
cryptography

data compression  
decoders  
demodulation  
dictionaries  
∞ interpretation  
translating  
Viterbi decoders

### decommissioning

DEF Disposal or deactivation of equipment or sites whose usefulness has diminished to a point where it is no longer required for its original purpose.

RT radioactive wastes  
underground storage

### decommutators

DEF Equipment for separation, demodulation, or demultiplexing commutated signals.

GS commutators  
. **decommutators**  
RT data links  
demodulators  
differential pulse code modulation  
electric motors  
∞ generators  
pulse code modulation  
telemetry

### decomposition

GS **decomposition**  
. ammonolysis  
. cracking (chemical engineering)  
. . hydrocracking  
. . pyrolysis  
. glycolysis  
. hydrogenolysis  
. . hydrocracking  
. nitrolysis  
. photodecomposition  
. photodissociation  
. photolysis  
. propellant decomposition  
. radiolysis  
. thermal decomposition  
. . pyrolysis  
RT ablation  
biodegradability  
biodegradation  
charring  
damage  
degradation  
deterioration  
disintegration  
dissociation  
electrolysis  
laterites  
overvoltage  
storage stability  
thermal dissociation

### decompression

USE **pressure reduction**

### decompression sickness

DEF A disorder experienced by deep sea divers and aviators caused by reduced atmospheric pressure and evolved gas bubbles in the body, marked by pain in the extremities, pain in the chest (chokes), occasionally leading to severe central nervous system symptoms and neurocirculatory collapse. Used for bends (physiology).

UF *bends (physiology)*  
GS sicknesses  
. **decompression sickness**  
RT aeroembolism  
altitude sickness  
barotrauma  
diving (underwater)

### deconditioning

GS behavior  
. **deconditioning**  
RT learning  
reflexes

### decongestants

GS drugs  
. **decongestants**

RT antihistaminics

### decontamination

GS **decontamination**  
. spacecraft sterilization  
RT air purification  
antiseptics  
carbon dioxide concentration  
carbon dioxide removal  
cleaning  
contaminants  
contamination  
dewaxing  
disposal  
dissipation  
elimination  
environmental cleanup  
ethylene oxide  
exhausting  
extensions  
∞ food  
planetary protection  
pollution  
purging  
purification  
purity  
∞ reduction  
∞ separation  
spacecraft contamination  
sterilization  
sterilization effects  
washing

### decoupling

GS **decoupling**  
. spin decoupling  
RT coupling  
disconnect devices  
gravitinos  
releasing

### decoys

GS **decoys**  
. ballistic missile decoys  
. Blue Goose missile  
. quail missile  
. reentry decoys  
RT countermeasures  
dummies

### decrementing

USE **reduction**

### deduction

RT derivation  
inference

### deep drawing

RT bulging  
cold drawing  
cold working  
explosive forming  
magnetic forming  
metal working  
stretching

### Deep Impact Mission

(added July 2005)

DEF Flyby mission designed to observe the collision of a solid impactor with comet Tempel 1. The mission consists of a flyby spacecraft, which releases a guided impactor. The flyby spacecraft is equipped with two telescopes, the High Resolution Instrument, and the Medium Resolution Instrument, for imaging and spectroscopy of the collision and its effects.

GS space missions  
. flyby missions  
. . **Deep Impact Mission**  
RT cometary collisions  
comets  
hypervelocity impact  
hypervelocity projectiles  
projectile cratering  
space probes  
Tempel 1 comet

### deep scattering layers

RT acoustic scattering  
echo sounding

- ∞ layers
  - oceanography
  - organisms
  - scattering
  - sound waves
  - underwater acoustics
- deep space**
  - GS environments
    - . aerospace environments
    - . . **deep space**
    - . . . interplanetary space
    - . . . interstellar space
    - . extraterrestrial environments
    - . . **deep space**
    - . . . interplanetary space
    - . . . interstellar space
  - RT cislunar space
    - frictionless environments
    - long duration space flight
  - ∞ space
- Deep Space 1 Mission**  
(added October 1998)
  - DEF First of several technology demonstration missions supporting the NASA New Millennium Program. Advanced technologies include an ion propulsion system, solar concentrator arrays, autonomous navigation and control systems, an integrated camera and imaging spectrometer, and several telecommunications and microelectronics devices. The mission plan includes a flyby of Asteroid 1992 KD.
  - UF *DS1 (space mission)*
  - GS space missions
    - . **Deep Space 1 Mission**
  - RT asteroid missions
    - autonomous navigation
    - flyby missions
    - interplanetary spacecraft
    - ion propulsion
    - NASA space programs
    - solar electric propulsion
- Deep Space Instrumentation Facility**
  - UF *DSIF (instrumentation facility)*
  - GS stations
    - . ground stations
    - . . **Deep Space Instrumentation Facility**
    - . tracking stations
    - . . **Deep Space Instrumentation Facility**
  - RT data acquisition
    - data transmission
    - radio control
- Deep Space Network**
  - DEF A communications network managed by the Jet Propulsion Laboratory for command and control of all planetary flights.
  - UF *DSN (space network)*
  - GS networks
    - . communication networks
    - . . **Deep Space Network**
    - . tracking networks
    - . . **Deep Space Network**
  - RT spacecraft tracking
- deep water**
  - GS water
    - . **deep water**
  - RT ocean bottom
    - oceanography
    - oceans
    - seas
    - submarine hydrothermal vents
- deep well injection (wastes)**
  - DEF Storage of liquid wastes, particularly chlorohydrocarbons, by injection into subsurface geologic strata for long term isolation from the environment.
  - GS injection
    - . fluid injection
    - . . liquid injection
    - . . . **deep well injection (wastes)**
- RT waste disposal
- deep-sea hydrothermal vents*  
(added April 2005)
  - USE **submarine hydrothermal vents**
- deepwater terminals**
  - RT artificial harbors
    - cargo ships
    - marine technology
    - marine transportation
    - oceanography
    - offshore docking
    - offshore energy sources
    - offshore platforms
  - ∞ ports
    - ship terminals
    - tanker ships
    - tanker terminals
  - ∞ tankers
    - terminal facilities
    - transportation
- deer**
  - GS animals
    - . vertebrates
    - . . mammals
    - . . . **deer**
    - . . . . caribou
  - RT grazing
    - livestock
- defects**
  - UF *flaws*
  - imperfections*
  - GS **defects**
    - . auditory defects
    - . crystal defects
    - . . crystal dislocations
    - . . . edge dislocations
    - . . . screw dislocations
    - . . point defects
    - . . . vacancies (crystal defects)
    - . . . . Frenkel defects
    - . . . . antisite defects
    - . hyperopia
    - . inclusions
    - . speech defects
    - . surface defects
  - RT castings
    - cavities
    - cracks
    - cumulative damage
    - damage
    - inhomogeneity
    - irregularities
    - leakage
    - pinholes
    - porosity
    - scoring
    - vignetting
    - voids
    - x ray analysis
- Defender project**
  - GS programs
    - . projects
    - . . **Defender project**
- ∞ **defense**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT air defense
    - antimissile defense
    - civil defense
    - Defense Communications Satellite System
    - defense communications system (DCS)
    - defense industry
    - defense program
    - DMSP satellites
    - missile defense
    - physiological defenses
- Defense Communications Satellite System**
  - GS telecommunication
    - . **Defense Communications Satellite System**
- . . Fleet Satellite Communication System
  - RT communication satellites
  - ∞ defense
    - radio relay systems
    - space communication
    - ∞ systems
- defense communications system (DCS)**
  - GS networks
    - . **defense communications system (DCS)**
    - telecommunication
    - . **defense communications system (DCS)**
  - RT communication networks
    - ∞ defense
    - military technology
    - ∞ systems
- defense industry**
  - GS industries
    - . **defense industry**
    - . . weapons industry
  - RT antimissile defense
    - ∞ defense
    - military technology
    - missile defense
- Defense Meteorological Satellite Program*
  - USE **DMSP satellites**
- defense program**
  - GS programs
    - . **defense program**
  - RT air defense
    - antimissile defense
    - armed forces (United States)
    - civil defense
    - ∞ defense
    - DMSP satellites
    - military technology
    - missile defense
    - space transportation system
    - weapons delivery
- definition**
  - RT accuracy
    - delineation
    - descriptions
    - dictionaries
    - ∞ measurement
    - nomenclatures
    - precision
    - resolution
- deflagration**
  - DEF A sudden or rapid burning, as opposed to a detonation or explosion.
  - GS combustion
    - . **deflagration**
  - RT backfire
    - fires
    - flashback
- deflating*
  - USE **inflatable structures**
  - pressure reduction**
- deflection**
  - RT bending
    - bending diagrams
    - camber
    - deformation
    - diffraction
    - dispersing
    - displacement
    - distortion
    - elastic deformation
    - flexing
    - Maxwell-Mohr method
    - reflection
    - refraction
    - scattering
    - structural strain
    - temperature inversions
    - torsion
    - variations
    - wave dispersion

## deflectors

yokes

### deflectors

DEF Plates, baffles, or the like that divert something in its movement or flow.

GS

**deflectors**  
. blast deflectors  
. flame deflectors

RT

attenuators  
baffles  
∞ diffusers  
diverters  
flow deflection  
gust alleviators  
reflectors  
safety devices  
shielding  
spoilers

### defluorination

GS chemical reactions  
. **defluorination**  
RT fluorination  
halogenation

### defocusing

GS focusing  
. **defocusing**  
RT ∞ optics

### defoliant

RT defoliation  
foliage  
forests  
herbicides  
leaves  
plants (botany)  
trees (plants)

### defoliation

RT brush (botany)  
defoliant  
deforestation  
forests  
grasses  
leaves  
plants (botany)  
trees (plants)

### deforestation

RT biological diversity  
biomass burning  
clearings (openings)  
conservation  
defoliation  
environment effects  
forests

### deformable mirrors

(added May 1998)  
GS mirrors  
. **deformable mirrors**  
RT adaptive optics  
light modulation  
phase modulation  
segmented mirrors

### deformation

DEF A change in the shape or size of a solid body.

GS

**deformation**  
. axial strain  
. elastic deformation  
. . elastic bending  
. . elastic buckling  
. nuclear deformation  
. plastic deformation  
. static deformation  
. tensile deformation  
. wave front deformation

RT

bending  
buckling  
camber  
collapse  
corrugating  
creep properties  
damage  
deflection  
deformers  
displacement

distortion  
elongation  
failure  
flexing  
fractures (materials)  
indentation  
kinking  
mechanical properties  
Portevin-le Chatelier effect  
set  
skewness  
stiffness  
strain distribution  
structural failure  
structural strain  
temperature inversions  
topology  
torsion  
twisting  
volumetric strain  
warpage  
wrinkling

### deformers

GS measuring instruments  
. **deformers**  
RT deformation  
dimensional measurement  
extensometers  
mechanical measurement  
strain gages  
stress measurement  
tensometers

### defrosting

RT deicing  
heating  
ice prevention  
melting  
refrigerating  
refrigerators

### degassing

DEF The deliberate removal of gas from a material, usually by application of heat under high vacuum. Used for bakeout.

UF

*bakeout*

GS

**degassing**  
. deoxygenation  
RT absorbers (equipment)  
aeration  
baking  
castings  
deoxidizing  
desorption  
gas evolution  
occlusion  
offgassing  
outgassing  
purging  
scavenging  
∞ separation

### degenerate matter

DEF A state of matter found in white dwarf stars and other ultrahigh-density objects in which the electrons follow Fermi-Dirac statistics, i.e., the matter reaches a density high enough so that the pressure increases more and more rapidly to the point where it becomes independent of the temperature and is a function of the density only, thereby departing from the classical laws of physics.

GS

matter (physics)  
. **degenerate matter**  
RT antimatter  
astrophysics  
black holes (astronomy)  
cosmic gases  
critical pressure  
density (mass/volume)  
extraterrestrial matter  
Fermi-Dirac statistics  
high pressure  
massive stars  
naked singularities  
neutron stars  
nuclear fusion  
∞ physics  
pulsars

rotating matter  
stellar cores  
stellar evolution  
stellar mass  
supermassive stars  
white dwarf stars

### degeneration

RT atrophy  
deterioration  
negative feedback

### degenerative feedback

USE **negative feedback**

### degradation

DEF Gradual deterioration in performance.

GS

**degradation**  
. biodegradation  
. thermal degradation  
. wave degradation

RT

chemical attack  
corrosion  
cumulative damage  
curing  
damage  
decay  
decomposition  
depolymerization  
deterioration  
discoloration  
durability  
embrittlement  
erosion  
hot corrosion  
oxidation  
pitting  
preserving  
rusting  
scale (corrosion)  
sterilization effects  
thermal dissociation  
weathering

### degrees of freedom

DEF A mode of motion, either angular or linear, with respect to a coordinate system, independent of any other mode. A body in motion has six possible degrees of freedom, three linear and three angular.

RT

equipartition theorem  
experiment design  
factor analysis  
null hypothesis  
phase rule  
quality control  
significance  
three dimensional motion  
torquers  
∞ variance

### DEHP

USE **diethyl hydrogen phosphite (DEHP)**

### dehumidification

DEF The reduction, by any process, of the quantity of water vapor within a given space.

GS

drying  
. **dehumidification**  
RT condensing  
cooling systems  
dehydration  
diffusion  
humidity  
refrigerating  
∞ separation  
silica gel

### dehydrated food

RT consumables (spacecrew supplies)  
dehydration  
drying apparatus  
∞ food  
food processing  
freeze drying  
preserving  
space flight feeding

### dehydration

GS drying

. **dehydration**  
 RT columns (process engineering)  
 dehumidification  
 dehydrated food  
 dewatering  
 evaporation  
 freeze drying  
 hydration  
 plasmolysis  
 ∞ separation  
 silica gel  
 thermogravimetry  
 water loss

**dehydrogenases**

(added June 2004)

DEF Class of oxidoreductase enzymes that catalyze the transfer of hydrogen atoms from a substrate to an acceptor other than oxygen.

GS biopolymers  
 . proteins  
 . . enzymes  
 . . . **dehydrogenases**  
 organic compounds  
 . proteins  
 . . enzymes  
 . . . **dehydrogenases**  
 RT oxidase

**dehydrogenation**

GS chemical reactions  
 . **dehydrogenation**  
 RT columns (process engineering)  
 hydroforming  
 hydrogenation  
 hydrogenolysis  
 oxidation  
 reduction (chemistry)

**deicers**

UF *deicing systems*  
 RT aircraft icing  
 airfoils  
 antiicing additives  
 deicing  
 ∞ heaters  
 heating equipment  
 ice prevention

**deicing**

RT aircraft icing  
 airfoils  
 antiicing additives  
 defrosting  
 deicers  
 ∞ heaters  
 heating equipment  
 ice prevention  
 melting

*deicing systems*USE **deicers****Deimos**

DEF A satellite of Mars orbiting at a mean distance of 23,500 kilometers.

GS celestial bodies  
 . natural satellites  
 . . Mars satellites  
 . . . **Deimos**  
 RT Charon  
 Mars (planet)  
 Nozomi Mars Orbiter  
 Phobos

**deionization**

DEF The removal of ions from a solution by ion exchange.

GS chemical reactions  
 . **deionization**  
 RT atomic recombination  
 demineralizing  
 exchanging  
 ion recombination  
 radiative recombination  
 ∞ separation

softening

*dekatrons*USE **counters****delaminating**

RT anodic stripping  
 debonding (materials)  
 interlaminar stress  
 peeling  
 ∞ separation

**Delaware**

GS nations  
 . United States  
 . . **Delaware**  
 RT Delaware River Basin (US)  
 Delmarva Peninsula (DE-MD-VA)

**Delaware Bay (US)**

GS bays (topographic features)  
 . **Delaware Bay (US)**  
 RT Atlantic Ocean  
 gulfs  
 inlets (topography)  
 New Jersey  
 Pennsylvania

**Delaware River Basin (US)**

GS landforms  
 . structural basins  
 . . river basins  
 . . . **Delaware River Basin (US)**  
 RT Delaware  
 New Jersey  
 New York  
 Pennsylvania  
 rivers  
 streams  
 valleys

**delay**

RT dwell  
 ∞ holding  
 lateness  
 stopping  
 time lag  
 ∞ time response  
 transmission rate (communications)

**delay circuits**

GS circuits  
 . **delay circuits**  
 . . phantastrons  
 RT acoustic delay lines  
 circulators (phase shift circuits)  
 comparator circuits  
 phase shift circuits

**delay lines**

GS **delay lines**  
 . acoustic delay lines  
 . delay lines (computer storage)  
 RT ∞ lines  
 time lag

**delay lines (computer storage)**

DEF In electronic computers, devices for producing a time delay of a signal.

GS computer components  
 . computer storage devices  
 . . **delay lines (computer storage)**  
 delay lines  
 . **delay lines (computer storage)**  
 RT shift registers

**deletion**

GS elimination  
 . **deletion**  
 RT disposal  
 removal

*Delfin aircraft*USE **L-29 jet trainer****Delft camera**

GS optical equipment  
 . cameras  
 . . **Delft camera**  
 photographic equipment  
 . cameras

. . **Delft camera****delineation**

RT boundaries  
 definition  
 ∞ profiles

**delivery**

GS **delivery**  
 . payload delivery (STS)  
 . weapons delivery  
 RT air drop operations  
 airdrops  
 cargo  
 circulation  
 hauling  
 materials handling  
 output  
 ∞ receiving  
 transportation  
 trucks

**Delmarva Peninsula (DE-MD-VA)**

GS landforms  
 . peninsulas  
 . . **Delmarva Peninsula (DE-MD-VA)**  
 RT Delaware  
 Maryland  
 Virginia

**Delphi method (forecasting)**

GS management methods  
 . **Delphi method (forecasting)**  
 predictions  
 . forecasting  
 . . technological forecasting  
 . . . **Delphi method (forecasting)**  
 RT estimating  
 ∞ methodology  
 operations research  
 pattern method (forecasting)  
 planning  
 probe method (forecasting)  
 profile method (forecasting)  
 technology assessment

**Delrin (trademark)**

GS plastics  
 . **Delrin (trademark)**  
 RT resins

**Delta 3 launch vehicle**

(added October 1998)

GS launch vehicles  
 . Delta launch vehicle  
 . . **Delta 3 launch vehicle**

**Delta 4 Heavy launch vehicle**

(added September 2005)

DEF Member of the Boeing Delta 4 family of launch vehicles designed to launch heavy payloads (~28,124 pounds) into geosynchronous transfer orbit (GTO) using three common booster cores (CBCs). The first stage CBC is powered by the RS-68 engine; the two second stages are powered by the RL10B-2 engine with two sizes of expanded fuel and oxidizer tanks.

GS launch vehicles  
 . Delta launch vehicle  
 . . **Delta 4 Heavy launch vehicle**  
 . heavy lift launch vehicles  
 . . **Delta 4 Heavy launch vehicle**  
 RT booster rocket engines  
 Delta 4 launch vehicle  
 liquid propellant rocket engines  
 rocket launching  
 spacecraft launching

**Delta 4 launch vehicle**

(added October 1998)

GS launch vehicles  
 . Delta launch vehicle  
 . . **Delta 4 launch vehicle**  
 RT Delta 4 Heavy launch vehicle

**delta antennas**

GS antennas  
 . **delta antennas**  
 RT antenna design  
 resonators



## Delta Clipper

transmission lines

### Delta Clipper

(added September 1994)

- GS launch vehicles
  - . reusable launch vehicles
  - . . single stage to orbit vehicles
  - . . . **Delta Clipper**
- reentry vehicles
  - . recoverable spacecraft
  - . . reusable spacecraft
  - . . . single stage to orbit vehicles
  - . . . . **Delta Clipper**
- RT aerospace planes
  - liquid propellant rocket engines
  - space transportation

*Delta Dagger aircraft*

USE **F-102 aircraft**

*Delta Dart aircraft*

USE **F-106 aircraft**

### delta function

- GS analysis (mathematics)
  - . real variables
  - . . **delta function**
- functions (mathematics)
  - . **delta function**

### Delta launch vehicle

- GS launch vehicles
  - . **Delta launch vehicle**
  - . . Delta 3 launch vehicle
  - . . Delta 4 Heavy launch vehicle
  - . . Delta 4 launch vehicle
- RT Anik 1
- Anik 2
- Anik satellites
- Beacon Explorer A
- ESSA 1 satellite
- ESSA 2 satellite
- ESSA 3 satellite
- ESSA 4 satellite
- ESSA 5 satellite
- ESSA 6 satellite
- ESSA 7 satellite
- ESSA 8 satellite
- ESSA 9 satellite
- Explorer 10 satellite
- Explorer 12 satellite
- Explorer 14 satellite
- Explorer 15 satellite
- Explorer 17 satellite
- Explorer 18 satellite
- Explorer 21 satellite
- Explorer 26 satellite
- Explorer 28 satellite
- Explorer 29 satellite
- Explorer 32 satellite
- Explorer 33 satellite
- Explorer 38 satellite
- Explorer 43 satellite
- Explorer 49 satellite
- Explorer 55 satellite
- International Magnetospheric Explorer
- OSO-1
- OSO-2
- OSO-4
- OSO-C
- outer planets explorers
- Pioneer 6 space probe
- Pioneer 7 space probe
- RCA Satcom satellites
- Space Shuttle upper stage D
- SYNCOM 1 satellite
- SYNCOM 2 satellite
- SYNCOM 3 satellite
- TIROS 2 satellite
- TIROS 3 satellite
- TIROS 4 satellite
- TIROS 5 satellite
- TIROS 6 satellite
- TIROS 7 satellite
- TIROS 8 satellite
- TIROS 9 satellite
- TIROS 10 satellite

### delta modulation

- GS coding

- . signal encoding
  - . . pulse modulation
  - . . . pulse code modulation
  - . . . . **delta modulation**
- modulation
- . pulse modulation
  - . . pulse code modulation
  - . . . **delta modulation**
- RT pulse communication

### delta wings

- DEF Triangularly shaped wings of aircraft.  
Used for triangular wings.
- UF *triangular wings*
  - GS airfoils
    - . wings
    - . . low aspect ratio wings
    - . . . **delta wings**
    - . . swept wings
    - . . . sweptback wings
    - . . . . **delta wings**
- planforms
- . wing planforms
  - . . sweptback wings
  - . . . **delta wings**
- RT arrow wings
- AVRO 707 aircraft
- caret wings
- FD 2 aircraft
- GA-5 aircraft
- variable sweep wings
- VATOL aircraft
- waveriders
- wing rock

### deltas

- GS landforms
  - . **deltas**
  - . . Mississippi Delta (LA)
  - . . Rhone Delta (France)
- RT alluvium
  - fans (landforms)
  - rivers
  - sands
  - soils

### demagnetization

- DEF The reduction of residual magnetism to an acceptable level.
- RT magnetic fields
    - ∞ reduction

### demand (economics)

- GS economics
  - . **demand (economics)**
- RT consumption
  - supplying

### demand assignment multiple access

- DEF A technique of assigning communication resources on an "as needed basis" such as in satellite communications. Used for DAMA.
- UF *DAMA*
  - GS telecommunication
    - . multiple access
    - . . **demand assignment multiple access**
- transmission
- . signal transmission
  - . . data transmission
  - . . . multiple access
  - . . . . **demand assignment multiple access**
- RT channel capacity
- communication networks
- communication satellites
- satellite networks

### demineralizing

- GS **demineralizing**
  - . bone demineralization
- RT crystallization
- deionization
- desalinization
- distillation
- ion exchanging
- osmosis
- purification
- reverse osmosis
- ∞ separation

- softening
- water treatment

*Democratic Peoples Republic of Korea*

USE **North Korea**

### Democratic Republic of Congo

- SN (REPLACED THE TERM "ZAIRE" IN 1997; ALL OLDER RECORDS HAVE BEEN UPDATED WITH THE NEW FORM OF THE TERM)
- UF *Belgian Congo*  
*Congo (Kinshasa)*  
*Zaire*
- GS nations
  - . **Democratic Republic of Congo**
- RT Africa

### demodulation

- RT amplitude modulation
- decoding
- demodulators
  - ∞ detectors
  - frequency modulation
  - heterodyning
  - intermodulation
  - modulation
  - phase modulation
  - pulse modulation
  - remodulation
  - telecommunication

### demodulators

- DEF Electronic devices which operate on an input of a modulated carrier to recover the modulating wave as an output.
- GS **demodulators**
    - . frequency compression
    - demodulators
    - . modems
    - . phase demodulators
    - . phase lock demodulators
  - RT amplitude modulation
  - decoders
  - decommutators
  - demodulation
  - frequency modulation
  - matched filters
  - modulation
  - modulators
  - phase modulation
  - pulse modulation

### demography

- DEF Statistical study of human populations, especially with reference to size, density, distribution, and vital data.
- RT adults
    - census
    - communities
  - ∞ density
  - ∞ distribution
  - human beings
  - inhabitants
  - megalopolises
  - nations
  - sociology
  - ∞ statistics

*demonstration*

USE **proving**

### demultiplexing

- DEF Separation of two or more signals that were previously combined by a compatible multiplexer and transmitted over a single channel.
- GS transmission
    - . **demultiplexing**
  - RT code division multiplexing
  - frequency division multiplexing
  - multiplexing
  - time division multiplexing
  - wavelength division multiplexing

*denaturation (biopolymers)*

USE **biopolymer denaturation**

### dendrimers

- (added October 2000)
- DEF A class of polymeric macromolecules characterized by a regular highly-branched mo-

lecular architecture resembling a spherical starburst, and a synthesis process that permits nearly complete control over critical molecular design parameters, such as size, shape, surface/interior chemistry, flexibility, and topology. Because of these characteristics, dendrimers are seen as important elements in the manufacture of nanoscale materials and devices.

- UF *dendritic polymers*  
*hyperbranched polymers*
- GS molecules
  - . macromolecules
  - . . **dendrimers**
- RT conducting polymers  
dendritic crystals  
nanostructure (characteristics)  
organometallic polymers
- ∞ polymers  
synthetic metals

#### dendrites

(added August 2004)

DEF Extensions of the nerve cell body. They are short and branched and receive stimuli from other neurons.

- GS cells (biology)
  - . neurons
  - . . **dendrites**
- RT nerves  
nervous system

#### dendritic crystals

- GS crystals
  - . **dendritic crystals**
- RT dendrimers  
isotropy  
needles  
whiskers (crystals)

#### dendritic drainage

USE **drainage patterns**

#### dendritic polymers

(added October 2000)

USE **dendrimers**

#### dendrochronology

DEF The use of annual growth rings in plant tissue to determine the age of the plant or tree. Used for tree ring dating.

- UF *tree ring dating*
- RT climatology  
geochronology  
periodic variations  
timberline  
trees (plants)

#### denitrogenation

- GS chemical reactions
  - . **denitrogenation**
- RT nitration

#### Denmark

- GS nations
  - . **Denmark**
- RT Danish space program  
Europe  
Greenland  
Scandinavia

#### dense plasmas

- GS particles
  - . charged particles
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **dense plasmas**
  - . . . . . plasma focus
  - . . . . . strongly coupled plasmas
  - . corpuscular radiation
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **dense plasmas**
  - . . . . . plasma focus
  - . . . . . strongly coupled plasmas
- RT astrophysics  
beta factor  
electron scattering  
high temperature plasmas  
nuclear fusion  
particle collisions

plasma compression  
spheromaks  
stellar structure

#### densification

- GS pressure
  - . **densification**
- RT agglomeration  
chemical vapor infiltration  
compacting  
compressing  
consolidation  
Ludox (trademark)  
pressurizing

#### densimeters

DEF Instruments for measuring the density or specific gravity of liquids, gases, or solids.

- GS measuring instruments
  - . **densimeters**
  - . . ultrasonic densimeters
- RT density (mass/volume)  
density measurement
- ∞ instruments
- ∞ measurement

#### densitometers

DEF Instruments for the measurement of optical density (photographic transmission, photographic reflection, visual transmission, etc.) of a material, generally of a photographic image.

- GS measuring instruments
  - . **densitometers**
  - . . microdensitometers
- RT gamma ray absorptiometry  
gravimeters  
optical equipment  
optical measurement  
optical measuring instruments  
photometers  
photon absorptiometry  
transmissometers

#### ∞ density

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT atmospheric density  
atom concentration  
biomass  
demography  
density (mass/volume)  
density (number/volume)  
flux density  
optical density  
porosity  
Rankine-Hugoniot relation

#### density (mass/volume)

DEF The mass per unit volume of a material at a specified temperature.

- UF *specific gravity*
- GS **density (mass/volume)**
  - . atmospheric density
  - . gas density
  - . space density
- RT absorptance  
absorptivity  
bulk modulus  
buoyancy  
compressibility  
degenerate matter  
densimeters
- ∞ density  
density measurement  
hydrometers  
internal friction  
isopycnic processes  
Lewis numbers  
opacity  
permeability
- ∞ physical properties  
porosity  
pycnometers  
stopping power  
transmissivity  
transmittance  
transparence  
ultrasonic densimeters  
viscosity

void ratio  
weight measurement

#### density (number/volume)

- GS **density (number/volume)**
  - . meteoroid concentration
  - . packing density
  - . particle density (concentration)
  - . . electron density (concentration)
  - . . . carrier density (solid state)
  - . . . electron density profiles
  - . . . ionospheric electron density
  - . . . magnetospheric electron density
  - . . electron distribution
  - . . . electron density profiles
  - . . ion density (concentration)
  - . . . ionospheric ion density
  - . . . magnetospheric ion density
  - . . . magnetospheric proton density
  - . . . proton density (concentration)
  - . . . . magnetospheric proton density
  - . . plasma density
  - . space density
- RT atmospheric density
- ∞ density

#### density (rate/area)

USE **flux density**

#### density distribution

- RT baroclinic waves  
Fokker-Planck equation  
Maxwell-Boltzmann density function  
shock discontinuity  
Taylor instability

#### density functional theory

(added February 2007)

DEF A quantum mechanical method used in physics and chemistry to investigate the electronic structure of many-body systems, in particular molecules and the condensed phases.

- RT atomic structure  
electron density (concentration)  
electron distribution  
electron states  
electronic structure  
ground state  
Hartree approximation  
many body problem  
quantum mechanics
- ∞ theories
- wave functions

#### density measurement

- GS **density measurement**
  - . gamma ray absorptiometry
  - . photon absorptiometry
  - . x ray density measurement
- RT chemical analysis  
densimeters  
density (mass/volume)  
hydrometers
- ∞ measurement  
mechanical measurement  
ultrasonic densimeters  
wind tunnel tests

#### density wave model

- GS models
  - . astronomical models
  - . . **density wave model**
- RT galactic structure  
mass distribution  
spiral galaxies  
wave equations

#### dental calculi

- GS deposits
  - . calculi
  - . . **dental calculi**
- RT lithiasis  
teeth  
tooth diseases

#### dentistry

- GS medical science
  - . **dentistry**
- RT medical equipment  
oral hygiene

## deoxidizing

teeth  
tooth diseases

### deoxidizing

GS chemical reactions  
. reduction (chemistry)  
. . . **deoxidizing**  
RT degassing  
∞ deoxygenation  
deoxygenation  
scavenging

### ∞ deoxygenation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT deoxidizing  
deoxygenation  
sterilization effects

### deoxygenation

GS degassing  
. **deoxygenation**  
RT deoxidizing  
∞ deoxygenation  
∞ reduction  
∞ separation

### deoxyribonucleic acid

DEF The molecule that encodes genetic information - a double-stranded molecule held together by weak bonds between base pairs of nucleotides. Used for DNA.

UF *DNA*  
*recombinant DNA*

GS acids  
. nucleic acids  
. . . **deoxyribonucleic acid**  
. . . complementary DNA  
biopolymers  
. nucleic acids  
. . . **deoxyribonucleic acid**  
. . . complementary DNA  
organic compounds  
. nucleic acids  
. . . **deoxyribonucleic acid**  
. . . complementary DNA  
RT adenosine monophosphate  
apoptosis  
chromatin  
cloning (biology)  
gene expression  
gene therapy  
genes  
genome  
mutagenesis  
plasmids  
polymerase chain reaction  
thymidine  
thymine  
transcription (genetics)

### dependence

UF *dependency*  
GS **dependence**  
. spatial dependencies  
. temperature dependence  
. time dependence  
RT group dynamics  
sociology

### *dependency*

USE **dependence**

### dependent variables

DEF Variables considered as a function of other variables, the latter being called independent.

GS analysis (mathematics)  
. **dependent variables**  
RT complex variables  
independent variables  
observability (systems)  
parameterization  
real variables  
∞ variable

### depersonalization

RT artificial intelligence  
automata theory  
automatic control

∞ automation  
cybernetics  
detachment  
disorders  
man machine systems  
mechanization  
personality  
personnel

### depletion

GS **depletion**  
. ozone depletion  
RT consumption  
depreciation  
dissipation  
elimination  
energy policy  
exhaustion  
exploitation  
life (durability)  
losses  
∞ reduction  
removal  
resources  
utilization

### deployment

RT game theory  
logistics  
military operations  
military technology  
∞ operations  
personnel  
strategy  
tactics

### depolarization

SN (EXCLUDES CONSIDERATION OF OPTICAL DEPOLARIZATION AND PARTICLE SPIN MISALIGNMENT)  
DEF A decrease in the polarization of an electrode at a specified current density. Used for depolarizers.  
UF *depolarizers*  
RT electrolytic polarization  
electrophysiology  
polarization (charge separation)  
∞ reduction  
spike potentials

### *depolarizers*

USE **depolarization**

### depolymerization

GS chemical reactions  
. **depolymerization**  
RT degradation  
deterioration  
polymerization

### deposition

UF *accretion*  
GS **deposition**  
. anodizing  
. electrodeposition  
. . . electroplating  
. electroless deposition  
. laser deposition  
. . . pulsed laser deposition  
. vapor deposition  
. . . metalorganic chemical vapor deposition  
. . . vacuum deposition  
RT accumulations  
coagulation  
coating  
coatings  
deposits  
electroforming  
electron bombardment  
forming techniques  
fouling  
magnetron sputtering  
metal coatings  
plating  
precipitation (chemistry)  
sediments  
∞ separation  
settling  
sputtering

thermophoresis

### deposits

SN (EXCLUDES BANK MINERAL AND GEOLOGICAL DEPOSITS)  
GS **deposits**  
. calculi  
. . . dental calculi  
. cryodeposits  
RT coatings  
corrosion  
crude oil  
deposition  
plating  
sediments  
sludge

### depreciation

RT depletion  
deterioration  
investments  
life (durability)  
wear

### depressants

GS **depressants**  
. central nervous system depressants  
RT anesthesiology

### ∞ depression

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT detachment  
disorders  
emotions  
∞ hollow  
introversion  
lethargy  
low pressure  
neurotic depression  
psychotic depression  
recession  
schizophrenia  
tectonics  
topography

### *depressions (topography)*

USE **structural basins**

### *depressurization*

USE **pressure reduction**

### deprivation

GS **deprivation**  
. sensory deprivation  
. sleep deprivation  
. water deprivation  
RT confining  
isolation  
stress (biology)  
stress (physiology)

### depth

GS dimensions  
. **depth**  
RT distance  
height  
thickness

### depth measurement

RT bathymeters  
core sampling  
distance measuring equipment  
echo sounding  
∞ measurement  
mechanical measurement  
sounding

### *depth perception*

USE **space perception**

### derivation

RT deduction  
∞ induction  
∞ origins  
parameterization

- ∞ sources
- derivation calculus*
- USE **differential calculus**
- dermatitis**
  - GS diseases
    - . infectious diseases
    - . . **dermatitis**
    - . . . contact dermatitis
  - RT bacterial diseases
    - dermatology
    - fungal diseases
    - itching
    - radiation hazards
    - radiation sickness
    - skin (anatomy)
- dermatology**
  - GS medical science
    - . **dermatology**
  - RT contact dermatitis
    - dermatitis
    - skin (anatomy)
- desalinization**
  - RT demineralizing
    - distillation
    - osmosis
    - purification
    - reverse osmosis
    - salinity
    - vaporizing
    - water treatment
- desaturation**
  - RT drying
    - ∞ saturation
- descaling**
  - RT chemical cleaning
    - cleaning
    - metal finishing
    - pickling (metallurgy)
    - scale (corrosion)
  - ∞ separation
    - shot peening
- descent**
  - GS **descent**
    - . parachute descent
  - RT approach
    - ascent
    - flight paths
    - gliding
    - reentry
    - uncontrolled reentry (spacecraft)
- descent propulsion systems**
  - GS propulsion
    - . **descent propulsion systems**
    - propulsion system configurations
    - . **descent propulsion systems**
  - RT spacecraft propulsion
    - ∞ systems
- descent trajectories**
  - GS trajectories
    - . **descent trajectories**
    - . . reentry trajectories
  - RT ascent trajectories
    - atmospheric entry
    - ballistic trajectories
    - coasting flight
    - falling
    - flight mechanics
    - manned reentry
    - midcourse trajectories
    - missile trajectories
    - parabolic flight
    - reentry
    - reentry guidance
    - spacecraft trajectories
    - terminal guidance
- descriptions**
  - RT characterization
    - definition
    - nomenclatures
- representations
- descriptive geometry**
  - GS geometry
    - . Euclidean geometry
    - . . **descriptive geometry**
  - RT analytic geometry
    - engineering drawings
    - layouts
  - ∞ projection
    - projective geometry
    - toruses
- desensitizing**
  - RT corrosion prevention
    - protective coatings
    - rusting
- desert adaptation**
  - GS adaptation
    - . **desert adaptation**
  - RT survival
- desertification**
  - DEF The formation of a desert or the gradual expansion of a desertline into previously usable land, due to man-made or natural causes.
  - RT arid lands
    - barren land
    - Death Valley (CA)
    - desertline
    - deserts
    - drought
    - Earth environment
    - Gobi desert
    - land
    - land use
    - man environment interactions
    - Mojave Desert (CA)
    - oases
    - remote sensing
    - Sahara Desert (Africa)
    - steppes
    - wadis
- desertline**
  - RT arid lands
    - climatology
    - desertification
    - land
    - topography
- deserts**
  - GS land
    - . **deserts**
    - . . Gobi desert
    - . . Libyan desert
    - . . Mojave Desert (CA)
    - . . Sahara Desert (Africa)
  - RT arid lands
    - barren land
    - climatology
    - Coachella Valley (CA)
    - Death Valley (CA)
    - desertification
    - dunes
    - Earth resources
    - Imperial Valley (CA)
    - Kalahari Basin (Africa)
    - oases
    - Palo Verde Valley (CA)
    - playas
    - remote regions
    - Salton Sea (CA)
    - topography
    - wilderness
- desiccants**
  - DEF Chemicals used to absorb moisture.
  - RT absorbents
    - adsorbents
- desiccation*
- USE **drying**
- desiccators**
  - GS separators
    - . drying apparatus
- . . **desiccators**
- ∞ **design**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
  - UF *tailoring*
  - RT aerodynamic configurations
    - aircraft design
    - amplifier design
    - antenna design
    - computer aided design
    - computer design
    - computer systems design
    - construction
    - control systems design
    - design analysis
    - design optimization
    - design to cost
    - dimensions
    - drafting machines
    - engine design
    - engineering drawings
    - equipment specifications
    - estimating
    - experiment design
    - factorial design
    - functional design specifications
    - helicopter design
    - IPAD
    - layouts
    - lens design
    - logic design
    - missile design
    - nozzle design
    - optimization
    - planning
    - plant design
    - pressure vessel design
    - product development
    - reactor design
    - reliability
    - research
    - research and development
    - rocket engine design
    - satellite design
    - shape optimization
    - spacecraft design
    - structural design
    - structural design criteria
  - ∞ synthesis
    - systems engineering
- design analysis**
  - RT ∞ analyzing
    - control systems design
  - ∞ design
    - design optimization
    - logic design
    - maintainability
    - multidisciplinary design optimization
    - optimization
    - reliability
    - reliability analysis
    - reverse engineering
    - safety factors
    - sensitivity analysis
    - shape optimization
    - Taguchi methods
    - value engineering
- design of experiments*
- USE **experiment design**
- design optimization**
  - (added February 2001)
  - GS optimization
    - . **design optimization**
    - . . shape optimization
  - RT aircraft design
    - computer aided design
  - ∞ design
    - design analysis
    - evolvable hardware
    - genetic algorithms
    - sensitivity analysis
    - structural analysis
    - structural design
    - structural design criteria

## design to cost

systems engineering

### design to cost

DEF A process whereby cost factors are determined and calculated for the life cycle of a product as an integral part of its design.

- RT concurrent engineering
- cost analysis
- costs
- ∞ design
- life cycle costs
- production costs

### desorption

DEF The process of removing sorbed gas.

- RT ∞ absorption
- adsorption
- degassing
- evolution (liberation)
- mischmetal
- outgassing
- permeating
- ∞ separation
- sublimation

### despinning

USE **spin reduction**

### destabilization

- RT spin reduction
- tumbling motion

### Destiny Laboratory Module

(added February 2001)

DEF Component of the International Space Station providing equipment and support systems for research and technology development. Also provides support and control for the US segment of the Space Station.

- UF *US Laboratory Module (ISS)*
- GS laboratories
  - . space laboratories
  - . . manned orbital laboratories
  - . . . **Destiny Laboratory Module**manned spacecraft
  - . manned orbital laboratories
  - . . **Destiny Laboratory Module**modules
  - . space station modules
  - . . **Destiny Laboratory Module**
- RT International Space Station
- spaceborne experiments

### Destroyer aircraft

USE **B-66 aircraft**

### destruction

- RT aborted missions
- accidents
- breaking
- cracking (fracturing)
- damage
- destructive tests
- failure
- fatigue (materials)
- flight hazards
- flight safety
- lethality
- spacecraft breakup
- stresses

### destructive tests

- GS **destructive tests**
  - . burst tests
- RT bend tests
- compression tests
- corrosion tests
- destruction
- drop tests
- fatigue tests
- fiber pushout
- impact tests
- load tests
- ∞ materials tests
- nondestructive tests
- tensile tests
- ∞ tests
- vibration tests

wear tests

### desulfurizing

- GS chemical reactions
  - . **desulfurizing**
- RT flue gases
- refining
- roasting

### desynchronization (biology)

DEF The loss of synchronization between two or more rhythms so that they show independent periods.

- GS biological effects
  - . **desynchronization (biology)**disorientation
  - . **desynchronization (biology)**psychological effects
  - . **desynchronization (biology)**
- RT jet lag
- physiological responses
- rhythm (biology)
- zeitgebers

### desynchronized sleep

USE **rapid eye movement state**

### detachment

DEF A particular state of isolation in which man is separated or detached from his accustomed behavioral environment by inordinate physical and psychological distances. This condition may compromise his performance.

- RT anxiety
- boredom
- depersonalization
- ∞ depression
- disorders
- disorientation
- emotional factors
- human behavior
- ∞ inhibition
- introversion
- lethargy
- psychology
- psychoses

### detection

- UF *sensing*
- GS **detection**
  - . aircraft detection
  - . change detection
  - . edge detection
  - . fault detection
  - . forest fire detection
  - . haze detection
  - . high altitude nuclear detection
  - . missile detection
  - . radar detection
  - . remote sensing
  - . signal detection
  - . . correlation detection
  - . asteroid detection
  - . chemical detection
  - . planet detection
  - . target recognition
  - . ultrasonic flaw detection
  - . . explosives detection
- RT acquisition
- data acquisition
- ∞ detectors
- early warning systems
- examination
- exploration
- gas detectors
- identifying
- inspection
- marking
- ∞ measurement
- missile signatures
- observation
- position (location)
- radar signatures
- signature analysis
- signatures
- sound localization
- sound ranging
- space observations (from Earth)
- surveillance
- target acquisition

targets

tracking (position)

warning

warning systems

### ∞ detectors

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF sensor.
- RT aircraft detection
- analyzers
- anticoincidence detectors
- autodynes
- character recognition
- correlation detection
- demodulation
- detection
- display devices
- FLIR detectors
- forest fire detection
- gas detectors
- hazards
- helmet mounted displays
- indicating instruments
- infrared detectors
- instrument receivers
- laser target designators
- life detectors
- measuring instruments
- mine detectors
- monitors
- multispectral linear arrays
- phase detectors
- radiation detectors
- radiation measuring instruments
- readers
- receivers
- remote sensors
- safety
- signal detection
- signal detectors
- squid (detectors)
- telecommunication
- transducers
- ultrasonic flaw detection
- ultraviolet detectors
- Venturi tubes
- warning
- warning systems

### detergents

- RT ethylenediaminetetraacetic acids
- lubricating oils
- soaps
- surfactants

### deterioration

- RT atrophy
- biodegradability
- biodegradation
- corrosion
- damage
- decay
- decomposition
- degeneration
- degradation
- depolymerization
- depreciation
- disintegration
- durability
- erosion
- erosive burning
- failure
- hot corrosion
- rusting
- soil erosion
- system failures
- wear
- wear resistance
- weathering

### determinants

- GS algebra
- . **determinants**
- RT linear equations

- matrices (mathematics)
- determination*  
USE **measurement**
- detonable gas mixtures**  
GS gases  
. gas mixtures  
. . **detonable gas mixtures**  
mixtures  
. solutions  
. . gas mixtures  
. . . **detonable gas mixtures**  
RT chemical explosions  
firing (igniting)  
flammability  
flammable gases  
gas explosions  
gas-gas interactions  
oxyacetylene  
reacting flow
- detonation**  
DEF A rapid chemical reaction which propagates at a supersonic velocity. Used for Chapman-Jouget flame.  
UF *Chapman-Jouget flame*  
RT chemical explosions  
combustion  
∞ discharge  
explosions  
firing (igniting)  
flame propagation  
initiation  
percussion  
primers (explosives)  
propellant explosions  
pulse detonation engines  
pulsejet engines  
rocket firing  
shock waves
- detonation waves**  
DEF Shock waves that accompany detonation and have a shock front followed by a region of decreasing pressure in which the reaction occurs.  
GS elastic waves  
. shock waves  
. . **detonation waves**  
RT combustible flow  
flame propagation  
gas explosions  
ram accelerators  
seismic waves  
sound waves  
∞ waves
- detonators**  
GS explosive devices  
. initiators (explosives)  
. . **detonators**  
igniters  
. initiators (explosives)  
. . **detonators**  
RT caps (explosives)  
exploding wires  
explosives  
fulminates  
fuses (ordnance)  
primers (explosives)  
sodium azides
- deuterides**  
GS hydrogen compounds  
. deuterium compounds  
. . **deuterides**  
RT hydrides
- deuterium**  
DEF A heavy isotope of hydrogen having one proton and one neutron in the nucleus. Used for hydrogen 2.  
UF *hydrogen 2*  
GS chemical elements  
. hydrogen  
. . hydrogen isotopes  
. . . **deuterium**  
. nuclides  
. . isotopes
- . . . hydrogen isotopes  
. . . . **deuterium**  
gases  
. hydrogen  
. . hydrogen isotopes  
. . . **deuterium**  
heavy water  
hydrogen fuels  
hydrogen plasma  
nuclear fuels
- RT
- deuterium compounds**  
GS hydrogen compounds  
. **deuterium compounds**  
. . deuterides  
. . deuterium fluorides  
. . heavy water  
RT ∞ chemical compounds
- deuterium fluoride lasers*  
USE **DF lasers**
- deuterium fluorides**  
DEF Fluorides of deuterium, a heavy isotope of hydrogen. Used for DF.  
UF *DF*  
GS halogen compounds  
. fluorine compounds  
. . fluorides  
. . . **deuterium fluorides**  
. halides  
. . fluorides  
. . . **deuterium fluorides**  
hydrogen compounds  
. deuterium compounds  
. . **deuterium fluorides**  
RT DF lasers
- deuterium oxides*  
USE **heavy water**
- deuterium plasma**  
GS particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)  
. . . . hydrogen plasma  
. . . . . **deuterium plasma**  
. corpuscular radiation  
. . energetic particles  
. . . plasmas (physics)  
. . . . hydrogen plasma  
. . . . . **deuterium plasma**  
RT deuterons  
hydrogen
- deuteron irradiation**  
GS irradiation  
. ion irradiation  
. . **deuteron irradiation**  
RT alpha particles  
charged particles  
nuclear fusion  
particles  
plasmas (physics)  
proton irradiation
- deuterons**  
DEF The nuclei of deuterium atoms.  
GS ions  
. **deuterons**  
particles  
. charged particles  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **deuterons**  
. corpuscular radiation  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **deuterons**  
. elementary particles  
. . **deuterons**  
RT alpha particles  
cosmic rays  
deuterium plasma  
photomagnetic effects  
plasmas (physics)  
Pomeranchuk theorem
- protons
- developers (photography)*  
USE **photographic developers**
- developing nations**  
RT Caribbean region  
economic development  
economic factors  
nations  
United Nations
- ∞ **development**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT angiogenesis  
energy policy  
evolution (development)  
exploitation  
growth  
land use  
management planning  
missile design  
personnel development  
photographic developers  
product development  
rural land use  
Starsite program  
training analysis  
urban development
- deviation**  
DEF The variation from a specified dimension or design requirement, usually defining upper and lower limits.  
RT aberration  
abnormalities  
asymmetry  
∞ dispersion  
distortion  
divergence  
∞ drift  
eccentricity  
heterogeneity  
irregularities  
nonsynchronization  
variations
- ∞ **devices**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air bag restraint devices  
alpha plasma devices  
antiskid devices  
bulk acoustic wave devices  
chips (memory devices)  
cyclotron resonance devices  
error correcting devices  
explosive devices  
lift devices  
lifting bodies  
mechanical devices  
nanostructures (devices)  
NDM semiconductor devices  
nuclear devices  
photoelectrochemical devices  
plasma display devices  
positioning devices (machinery)  
safety devices  
self erecting devices  
self repairing devices  
solid state devices  
surface acoustic wave devices  
training devices  
TRAPATT devices
- devitrification*  
USE **crystallization**
- dew**  
RT acid rain  
frost  
hydrometeors  
precipitation (meteorology)  
water vapor
- dew point**  
DEF Temperature at which water vapor begins to condense.

## dewatering

RT atmospheric moisture  
condensing  
hygrometers  
saturation (chemistry)

### Dewar systems

USE **cryogenic equipment**

## dewatering

DEF Removal of water by draining, pumping, or other means.

RT dehydration  
drying  
pollution control  
waste disposal  
water reclamation

## dewaxing

RT decontamination  
refining

## dewetting

USE **drying**

## dextrans

GS biopolymers  
. polysaccharides  
. . . **dextrans**  
organic compounds  
. carbohydrates  
. . polysaccharides  
. . . **dextrans**  
. . sugars  
. . . **dextrans**

## DF

USE **deuterium fluorides**

## DF lasers

DEF Gas lasers in which the active material is deuterium fluoride. Used for deuterium fluoride lasers.

UF *deuterium fluoride lasers*  
GS stimulated emission devices  
. lasers  
. . gas lasers  
. . . **DF lasers**  
RT deuterium fluorides

### DH 106 aircraft

USE **Comet 4 aircraft**

## DH 112 aircraft

UF *de Havilland DH 112 aircraft*  
*de Havilland Venom aircraft*  
*Venom aircraft*  
GS attack aircraft  
. fighter aircraft  
. . **DH 112 aircraft**  
de Havilland aircraft  
. **DH 112 aircraft**  
Hawker Siddeley aircraft  
. **DH 112 aircraft**  
jet aircraft  
. **DH 112 aircraft**  
monoplanes  
. **DH 112 aircraft**  
RT ∞ aircraft

## DH 115 aircraft

UF *de Havilland DH 115 aircraft*  
*Vampire aircraft*  
GS attack aircraft  
. **DH 115 aircraft**  
de Havilland aircraft  
. **DH 115 aircraft**  
Hawker Siddeley aircraft  
. **DH 115 aircraft**  
jet aircraft  
. **DH 115 aircraft**  
monoplanes  
. **DH 115 aircraft**  
RT ∞ aircraft

## DH 121 aircraft

UF *de Havilland DH 121 aircraft*  
*Trident aircraft*  
GS commercial aircraft  
. **DH 121 aircraft**  
de Havilland aircraft  
. **DH 121 aircraft**

Hawker Siddeley aircraft

. **DH 121 aircraft**  
jet aircraft  
. turbofan aircraft  
. . **DH 121 aircraft**  
monoplanes  
. **DH 121 aircraft**  
passenger aircraft  
. **DH 121 aircraft**  
transport aircraft  
. **DH 121 aircraft**  
RT ∞ aircraft

## DH 125 aircraft

UF *de Havilland DH 125 aircraft*  
*HS-125 aircraft*  
*Jet Dragon aircraft*  
GS de Havilland aircraft  
. **DH 125 aircraft**  
general aviation aircraft  
. **DH 125 aircraft**  
Hawker Siddeley aircraft  
. **DH 125 aircraft**  
jet aircraft  
. **DH 125 aircraft**  
light aircraft  
. **DH 125 aircraft**  
monoplanes  
. **DH 125 aircraft**  
passenger aircraft  
. **DH 125 aircraft**  
transport aircraft  
. **DH 125 aircraft**  
RT ∞ aircraft

## DHC 2 aircraft

DEF De Havilland Canada STOL utility aircraft. Used for DHC Beaver aircraft.

UF *DHC Beaver aircraft*  
GS de Havilland aircraft  
. **DHC 2 aircraft**  
general aviation aircraft  
. **DHC 2 aircraft**  
jet aircraft  
. **DHC 2 aircraft**  
monoplanes  
. **DHC 2 aircraft**  
transport aircraft  
. **DHC 2 aircraft**  
RT ∞ aircraft

## DHC 4 aircraft

UF *AC-1 aircraft*  
*Caribou aircraft*  
*CV-2 aircraft*  
*de Havilland DHC 4 aircraft*  
GS de Havilland aircraft  
. **DHC 4 aircraft**  
monoplanes  
. **DHC 4 aircraft**  
transport aircraft  
. **DHC 4 aircraft**  
utility aircraft  
. **DHC 4 aircraft**  
V/STOL aircraft  
. short takeoff aircraft  
. . **DHC 4 aircraft**  
RT ∞ aircraft

## DHC 5 aircraft

UF *Buffalo aircraft*  
*CV-7 aircraft*  
*de Havilland DHC 5 aircraft*  
GS de Havilland aircraft  
. **DHC 5 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **DHC 5 aircraft**  
monoplanes  
. **DHC 5 aircraft**  
transport aircraft  
. **DHC 5 aircraft**  
utility aircraft  
. **DHC 5 aircraft**  
V/STOL aircraft  
. short takeoff aircraft  
. . **DHC 5 aircraft**

RT ∞ aircraft

### DHC Beaver aircraft

USE **DHC 2 aircraft**

## diabetes mellitus

GS diseases  
. **diabetes mellitus**  
RT carbohydrate metabolism  
enzyme activity  
insulin  
pancreas  
urinalysis

## Diademe satellites

GS artificial satellites  
. **Diademe satellites**

## diagnosis

RT ∞ analyzing  
anesthesiology  
behavior  
biomarkers  
clinical medicine  
diseases  
examination  
injuries  
medical equipment  
medical science  
pathology  
prognosis  
psychology  
psychometrics  
telemedicine  
veterinary medicine

## diagrams

GS **diagrams**  
. bending diagrams  
. block diagrams  
. circuit diagrams  
. color-color diagram  
. color-magnitude diagram  
. creep diagrams  
. Feynman diagrams  
. Hertzsprung-Russell diagram  
. Mollier diagram  
. Nyquist diagram  
. phase diagrams  
. S-N diagrams  
. stress-strain diagrams  
. tephigrams  
. Venn diagrams  
. Voronoi diagrams  
RT charts  
drawings  
geometry  
graphic arts  
visual aids

### DIAL (lidar)

USE **differential absorption lidar**

## DIAL satellite

GS artificial satellites  
. scientific satellites  
. . **DIAL satellite**  
RT aeronomy  
astronomical photometry  
European space programs  
satellite-borne instruments

## diallyl compounds

RT allyl compounds  
∞ chemical compounds

## dials

UF *pointers*  
RT display devices  
indicating instruments

## dialysis

GS **dialysis**  
. electro dialysis  
RT diaphragms (mechanics)  
diffusion  
extraction  
permeating

∞ separation

**diamagnetism**

UF *Meissner effect*  
 GS magnetic properties  
 . **diamagnetism**  
 RT Curie temperature  
 cyclotron resonance  
 electrical properties  
 ferromagnetism  
 paramagnetism

**Diamant launch vehicle**

GS launch vehicles  
 . **Diamant launch vehicle**  
 rocket vehicles  
 . multistage rocket vehicles  
 . . **Diamant launch vehicle**  
 RT liquid propellant rocket engines  
 solid propellant rocket engines

**diameters**

DEF Lengths of the longest straight lines through the centers of the largest cross sections.

GS dimensions  
 . **diameters**  
 RT circumferences  
 geometry  
 radii  
 thickness

**diamines**

GS organic compounds  
 . amines  
 . . **diamines**  
 . . . ethylenediamine  
 . . . guanidines  
 . . . . guanethidine  
 . . . . triaminoguanidinium azide

**diamond films**

(added November 1991)

GS thin films  
 . **diamond films**  
 RT amorphous silicon  
 coatings  
 diamonds  
 metal films  
 semiconducting films  
 space processing  
 vacuum deposition  
 vapor deposition

*diamond pyramid hardness*

(added October 2001)

USE **Vickers hardness**

*diamond wings*

USE **low aspect ratio wings**  
**swept wings**

**diamonds**

DEF (A) An isometric mineral, representing a naturally occurring crystalline form of carbon dimorphous with graphite and being the hardest natural substance known. (B) Artificially produced crystallized carbon similar to the native form. (C) A crystalline mineral that resembles diamonds in brilliance.

GS **diamonds**  
 . meteoritic diamonds  
 RT abrasives  
 carbon  
 diamond films  
 single crystals

**diaphragm (anatomy)**

DEF Musculomembranous partition separating the abdominal and thoracic cavities.

GS anatomy  
 . musculoskeletal system  
 . . muscles  
 . . . **diaphragm (anatomy)**  
 . . . respiratory system  
 . . **diaphragm (anatomy)**  
 RT ∞ diaphragms

thorax

∞ **diaphragms**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT diaphragm (anatomy)  
 diaphragms (mechanics)  
 electrolytic cells  
 membranes

**diaphragms (mechanics)**

SN (NON-ANATOMICAL)  
 UF *bladders (mechanics)*  
 GS **diaphragms (mechanics)**  
 . expulsion bladders  
 RT catholytes  
 dialysis  
 ∞ diaphragms  
 electrolytic cells  
 membrane structures  
 membranes  
 optical filters  
 osmosis  
 thin plates  
 thin walls  
 webs (sheets)  
 webs (supports)

**diastole**

GS heart function  
 . **diastole**  
 RT blood circulation  
 blood flow  
 blood pressure  
 cardiovascular system  
 diastolic pressure  
 heart  
 heart rate  
 systole

**diastolic pressure**

GS pressure  
 . blood pressure  
 . . **diastolic pressure**  
 RT cardiac ventricles  
 diastole

**diatomic gases**

GS gases  
 . molecular gases  
 . . polyatomic gases  
 . . . **diatomic gases**

**diatomic molecules**

GS molecules  
 . polyatomic molecules  
 . . **diatomic molecules**  
 RT low molecular weights  
 methylidyne  
 Morse potential  
 triatomic molecules

*diatoms (unicellular plants)*

USE **algae**

*DIB*

(added February 1997)

USE **diffuse interstellar bands**

**dibasic compounds**

RT ∞ chemical compounds  
 monomers

**diborane**

GS boron compounds  
 . **diborane**  
 hydrogen compounds  
 . hydrides  
 . . **diborane**

**dibromides**

GS halogen compounds  
 . bromine compounds  
 . . bromides  
 . . . **dibromides**  
 . halides  
 . . bromides

. . . **dibromides****dibutyl compounds**

GS alkyl compounds  
 . **dibutyl compounds**  
 RT ∞ chemical compounds  
 tetrabutyls

**dicarboxylic acids**

GS acids  
 . carboxylic acids  
 . . **dicarboxylic acids**  
 organic compounds  
 . carboxylic acids  
 . . **dicarboxylic acids**  
 RT terephthalate

**dichlorides**

GS halogen compounds  
 . chlorine compounds  
 . . chlorides  
 . . . **dichlorides**  
 . halides  
 . . chlorides  
 . . . **dichlorides**

*dichlorodiphenyltrichloroethane*

USE **DDT**

**dichotomies**

GS classifications  
 . hierarchies  
 . . **dichotomies**

**dichroism**

GS electromagnetic properties  
 . optical properties  
 . . **dichroism**  
 RT color  
 isochromatics  
 light (visible radiation)  
 photoelasticity

*dichromates*

USE **chromates**

**Dicke radiometers**

UF *Dicke type radiometers*  
 GS measuring instruments  
 . radiation measuring instruments  
 . . actinometers  
 . . . radiometers  
 . . . . **Dicke radiometers**  
 RT bolometers  
 thermopiles

*Dicke type radiometers*

USE **Dicke radiometers**

**dictionaries**

UF *glossaries*  
 GS documents  
 . **dictionaries**  
 RT abbreviations  
 coding  
 decoding  
 definition  
 nomenclatures  
 space glossaries  
 terminology

**didymium**

DEF A mixture of rare earth elements that is freed from cerium. It was once regarded as an element but contains chiefly neodymium and praseodymium and is usually associated with lanthanum. It is used in coloring glass for optical filters.

RT lanthanum  
 neodymium  
 optical filters  
 praseodymium

**dieldrin**

GS poisons  
 . pesticides  
 . . insecticides



## dielectric loss

... **dieldrin**

*dielectric constant*  
USE **permittivity**

**dielectric loss**  
(added April 2000)  
DEF The electric energy that is converted into heat in a dielectric material subjected to a changing electric field.  
GS electrical properties  
. dielectric properties  
. . **dielectric loss**  
losses  
. **dielectric loss**  
RT dielectrics  
energy dissipation  
permittivity

*dielectric materials*  
USE **dielectrics**

**dielectric permeability**  
GS permeability  
. **dielectric permeability**  
RT magnetic permeability

**dielectric polarization**  
GS polarization (charge separation)  
. **dielectric polarization**  
RT dielectrics  
electrets  
electric fields

**dielectric properties**  
GS electrical properties  
. **dielectric properties**  
. . dielectric loss  
. . permittivity  
RT antiferroelectricity  
capacitance  
ferroelectricity  
 $\infty$  properties  
Sommerfeld waves

**dielectric waveguides**  
(added February 1998)  
GS waveguides  
. **dielectric waveguides**  
RT dielectrics  
microwave transmission  
optical waveguides  
waveguide antennas  
waveguide filters

**dielectrics**  
DEF Substances that contain few or no free charges and which can support electrostatic stresses. Used for dielectric materials.  
UF *dielectric materials*  
GS **dielectrics**  
. lossless materials  
. radome materials  
RT barium titanates  
capacitance switches  
capacitive fuel gages  
capacitors  
ceramics  
dielectric loss  
dielectric polarization  
dielectric waveguides  
electrets  
electric conductors  
electrical insulation  
electromagnetic surface waves  
field mode theory  
 $\infty$  insulated structures  
insulators  
magnetoelectric media  
screen effect  
spark gaps  
sulfur hexafluoride

*dielectronic satellite lines*  
USE **resonance lines**

**Diels-Alder reactions**  
GS chemical reactions  
. cycloaddition  
. . **Diels-Alder reactions**

RT organic chemistry

**diencephalon**  
GS anatomy  
. nervous system  
. . central nervous system  
. . . brain  
. . . . **diencephalon**  
. . . . . hypothalamus  
. . . . . pineal gland  
. . . . . thalamus  
RT embryology

**dienes**  
GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . **dienes**  
. . . . butadiene  
. . . . heptadiene  
. . . . hexadiene  
. . . . polybutadiene

**dies**  
RT casting  
coining  
cutters  
extruding  
injection molding  
machine tools  
molds  
pultrusion  
punches  
rheocasting  
stamping

**diesel engines**  
GS engines  
. internal combustion engines  
. . **diesel engines**  
. . piston engines  
. . . **diesel engines**  
RT locomotives

**diesel fuels**  
GS fuels  
. chemical fuels  
. . hydrocarbon fuels  
. . . **diesel fuels**  
. . liquid fuels  
. . . **diesel fuels**  
products  
. petroleum products  
. . **diesel fuels**  
RT automobile fuels  
gasoline  
internal combustion engines  
kerosene

**diethyl compounds**  
(added July 1992)  
GS organic compounds  
. **diethyl compounds**  
. . diethyl ether  
. . diethyl hydrogen phosphite (DEHP)  
RT ethyl compounds  
triethyl compounds

**diethyl ether**  
GS ethers  
. **diethyl ether**  
organic compounds  
. diethyl compounds  
. . **diethyl ether**

**diethyl hydrogen phosphite (DEHP)**  
UF *DEHP*  
GS organic compounds  
. diethyl compounds  
. . **diethyl hydrogen phosphite (DEHP)**  
phosphorus compounds  
. **diethyl hydrogen phosphite (DEHP)**  
RT ethyl compounds

**diets**  
RT caloric requirements  
fasting  
 $\infty$  food

nutrition  
space flight feeding

**difference equations**  
GS analysis (mathematics)  
. numerical analysis  
. . **difference equations**  
RT approximation  
differences  
differential equations  
 $\infty$  equations  
finite difference theory  
linear evolution equations  
nonlinear evolution equations  
numerical stability

**differences**  
RT difference equations  
divergence  
finite difference theory  
gradients  
variations

**differential absorption lidar**  
(added September 1992)  
UF *DIAL (lidar)*  
GS radar  
. optical radar  
. . **differential absorption lidar**  
RT absorption spectra  
atmospheric sounding  
backscattering  
radar measurement  
remote sensing

*differential algebra*  
USE **differential calculus matrices (mathematics)**

**differential amplifiers**  
GS amplifiers  
. **differential amplifiers**  
RT analog computers  
error signals  
operational amplifiers  
transistor amplifiers

**differential analyzers**  
DEF Analog computers designed and used primarily for solving differential equations.  
RT algorithms  
analog computers  
computerized simulation  
differential equations  
digital computers  
digital integrators

**differential calculus**  
UF *derivation calculus*  
*differential algebra*  
GS analysis (mathematics)  
. calculus  
. . **differential calculus**  
RT  $\infty$  differentiation  
differentiators  
integral calculus  
limits (mathematics)  
minima  
numerical differentiation  
optimization  
real variables

**differential equations**  
UF *differential operators*  
*integrodifferential equations*  
GS analysis (mathematics)  
. real variables  
. . **differential equations**  
. . . Blasius equation  
. . . Chandrasekhar equation  
. . . cosine series  
. . . Duffing differential equation  
. . . Falkner-Skan equation  
. . . hyperbolic differential equations  
. . . Lamé wave equations  
. . . partial differential equations  
. . . biharmonic equations  
. . . . Burger equation  
. . . . Cauchy-Riemann equations  
. . . . elliptic differential equations

. . . . Monge-Ampere equation  
 . . . . Euler-Cauchy equations  
 . . . . Ffowcs Williams-Hawkings equation  
 . . . . Fokker-Planck equation  
 . . . . Gauss equation  
 . . . . Helmholtz vorticity equation  
 . . . . Liouville equations  
 . . . . parabolic differential equations  
 . . . . Poisson equation  
 . . . . vlasov equations  
 . . . . Riccati equation  
 . . . . vorticity equations  
 . . . . Helmholtz vorticity equation  
 RT Airy function  
 alternating direction implicit methods  
 asymptotic properties  
 backward differencing  
 Bessel functions  
 Bethe-Salpeter equation  
 bond graphs  
 boundary layer equations  
 boundary value problems  
 calculus  
 calculus of variations  
 Cauchy problem  
 Crank-Nicholson method  
 difference equations  
 differential analyzers  
 Dirichlet problem  
 distributed parameter systems  
 ∞ equations  
 Floquet theorem  
 Fourier analysis  
 Fourier-Bessel transformations  
 functional integration  
 Green's functions  
 half planes  
 Hankel functions  
 Hill determinant  
 ill-conditioned problems  
 (mathematics)  
 ill-posed problems (mathematics)  
 integral equations  
 integrals  
 Lagrange multipliers  
 Lamé functions  
 Laplace transformation  
 Liapunov functions  
 linear equations  
 linearity  
 Lipschitz condition  
 Mathieu function  
 maximum principle  
 Milne method  
 Neumann problem  
 nonlinear equations  
 nonlinearity  
 numerical analysis  
 numerical differentiation  
 numerical integration  
 numerical stability  
 operational calculus  
 Pfaff equation  
 potential theory  
 predictor-corrector methods  
 Riemann waves  
 Riesz theorem  
 Schauder fixpoint theorem  
 Schmidt method  
 spectral methods  
 stability derivatives  
 Sturm-Liouville theory  
 vector analysis  
 Whittaker functions

**differential games**

(added October 1998)

GS games  
 . differential games  
 RT minimax technique  
 optimal control  
 pursuit-evasion games  
 stochastic processes  
 zero sum games

**differential geometry**

UF nonEuclidian geometry  
 GS geometry

**differential geometry**

. . lie groups  
 . . . spinor groups  
 . . Riemann manifold  
 . . tensor analysis  
 RT analytic geometry  
 ∞ analyzing  
 curvature  
 curves (geometry)  
 invariant imbeddings  
 lofting  
 relativity

**differential interferometry**

GS interferometry  
 . differential interferometry  
 RT flow visualization  
 holography  
 Schlieren photography

*differential operators*

USE differential equations  
 operators (mathematics)

**differential pressure**

GS pressure  
 . differential pressure  
 RT pressure distribution  
 pressure gradients  
 pressure measurement

**differential pulse code modulation**

DEF An efficient signal encoding method of reducing the transmission rate of digital signals. The basic principle of DPCM is to quantize code and transmit the difference between the actual sample and prediction value. Used for DPCM (modulation).

UF DPCM (modulation)  
 GS coding  
 . signal encoding  
 . . pulse modulation  
 . . . pulse code modulation  
 . . . . differential pulse code modulation  
 modulation  
 . pulse modulation  
 . . pulse code modulation  
 . . . differential pulse code modulation  
 RT biternary code  
 decommutators  
 linear prediction  
 P.A.C.M. telemetry  
 PCM telemetry  
 pulse communication  
 pulse frequency modulation  
 telemetry  
 unified S band

*differential thermal analysis*

USE thermal analysis

∞ differentiation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT TERMS LISTED BELOW)  
 RT anatomy  
 cytogenesis  
 differential calculus  
 differentiation (biology)  
 discrimination

**differentiation (biology)**

GS cytogenesis  
 . differentiation (biology)  
 RT anatomy  
 biological diversity  
 ∞ biology  
 ∞ differentiation  
 embryology  
 interleukins  
 morphology  
 physiology

**differentiators**

DEF In computer operations, devices whose output is proportional to the derivative of an input signal. In electronics, a transducer whose output waveform is the time derivative of its input waveform.

RT circuits  
 differential calculus  
 integrators

**diffraction**

DEF The process by which the direction of radiation is changed so that it spreads into the geometric shadow region of an opaque or refractive object that lies in a radiation field. Used for interference monochromatization and Kirchhoff-Huygens principle.

UF interference monochromatization  
 Kirchhoff-Huygens principle

GS **diffraction**

. electron diffraction  
 . Fresnel diffraction  
 . neutron diffraction  
 . pulse diffraction  
 . wave diffraction  
 . x ray diffraction

RT atmospheric scattering  
 attenuation  
 Bragg angle  
 caustics (optics)  
 crystal optics  
 Debye-Scherrer method  
 deflection  
 diffractometers  
 echelette gratings  
 echelle gratings  
 electromagnetic radiation  
 geometrical theory of diffraction  
 Huygens principle  
 isochromatics  
 Laue method  
 Moire effects  
 mosaics  
 optical properties  
 ray tracing  
 refraction  
 transmission  
 wave dispersion  
 wave propagation

*diffraction gratings*

USE gratings (spectra)

**diffraction limited cameras**

GS optical equipment  
 . cameras  
 . . diffraction limited cameras  
 photographic equipment  
 . cameras  
 . . diffraction limited cameras  
 RT astronomical photography  
 spaceborne photography  
 spaceborne telescopes

*diffraction optics*

USE diffractive optics

**diffraction paths**

RT Bragg angle  
 electron trajectories  
 holographic optical elements  
 multipath transmission  
 optical paths  
 ∞ paths  
 spherical waves

**diffraction patterns**

UF fringe patterns  
 GS distribution (property)  
 . radiation distribution  
 . . diffraction patterns  
 . . . Kossel pattern  
 . . . rainbows  
 RT diffractometers  
 Fresnel integrals  
 Fresnel region  
 fringe multiplication  
 geometrical theory of diffraction  
 holographic interferometry  
 interferometry  
 Moire fringes  
 Moire interferometry  
 null zones  
 ∞ optics  
 ∞ patterns  
 phase contrast

## diffraction propagation

Pomeranchuk theorem  
signal fading  
speckle holography  
speckle interferometry  
speckle patterns  
underwater optics  
very long base interferometry

### diffraction propagation

DEF Wave propagation around objects, or over the horizon, by diffraction.

GS transmission  
. wave propagation  
. . **diffraction propagation**  
RT diffraction radiation  
geometrical optics  
∞ optics  
∞ propagation  
spherical waves  
underwater optics

### diffraction radiation

DEF Electromagnetic radiation excited by an electron flux passing near a diffractive, periodic structure, such as a wiggler magnet in a free electron laser.

GS electromagnetic radiation  
. **diffraction radiation**  
RT bremsstrahlung  
cyclotron resonance devices  
diffraction propagation  
electron beams  
electron diffraction  
free electron lasers  
gratings (spectra)  
laser outputs  
light emission  
maser outputs  
masers  
microwave emission  
microwave oscillators  
microwave tubes  
microwaves  
nonuniform magnetic fields  
particle motion  
relativistic electron beams  
stimulated emission devices  
transferred electron devices  
tunable lasers  
wave diffraction  
wave excitation  
wiggler magnets

*diffraction telescopes*

USE **spectroscopic telescopes**

### diffractive optics

(added July 1995)

DEF Optical elements that add up scattered light from a multiple of disturbances in amplitude or phase to generate a transformed wavefront.

UF *diffraction optics*  
RT display devices  
holography  
∞ optics  
photopolymers

### diffractionometers

GS measuring instruments  
. optical measuring instruments  
. . **diffractionometers**  
optical equipment  
. optical measuring instruments  
. . **diffractionometers**  
RT chemical analysis  
diffraction  
diffraction patterns  
etalons  
goniometers  
interferometers  
Mach-Zehnder interferometers  
optical measurement  
photogoniometers  
spectrometers  
wave front reconstruction

### diffuse interstellar bands

(added February 1997)

UF *DIB*  
GS spectra

. spectral bands  
. . **diffuse interstellar bands**  
RT interstellar chemistry  
interstellar extinction  
interstellar matter  
molecular clouds  
polycyclic aromatic hydrocarbons

### diffuse radiation

DEF Radiant energy propagating in many different directions through a given small volume of space; to be contrasted with parallel radiation. Used for lunar scattering.

UF *lunar scattering*  
RT heat transfer  
light scattering  
point sources  
∞ radiation  
specular reflection

### ∞ diffusers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF Specially designed ducts, chambers, or sections, sometimes equipped with guide vanes, that decrease the velocity of a fluid, as air, and increases its pressure, as in jet engines, wind tunnels, etc. Used for shock diffusers.  
UF *shock diffusers*  
RT air conditioning  
air conditioning equipment  
attenuators  
baffles  
boundary layer separation  
ceilings (architecture)  
chokes  
conical flow  
deflectors  
diffusion  
diverters  
engine inlets  
exhaust diffusers  
hypersonic inlets  
∞ illumination  
inlet flow  
inlet nozzles  
louvers  
mixers  
mufflers  
∞ nozzles  
porous walls  
pressure recovery  
separators  
sprayers  
supersonic diffusers  
vaneless diffusers  
ventilators

### diffusion

DEF In an atmosphere, or in any gaseous system, the exchange of fluid parcels between regions, in apparently random motions of a scale too small to be treated by the equations of motion. In materials, the movement of atoms of one material into the crystal lattice of an adjoining material, e.g., penetration of the atoms in a ceramic coating into the lattice of the protected metal. In ion engines, the migration of neutral atoms through a porous structure incident to ionization at the emitting surface. Used for diffusion effect and perfusion.

UF *diffusion effect*  
*perfusion*  
GS **diffusion**  
. ambipolar diffusion  
. atmospheric diffusion  
. gaseous diffusion  
. . gaseous self-diffusion  
. magnetic diffusion  
. molecular diffusion  
. particle diffusion  
. . electron diffusion  
. . ionic diffusion  
. plasma diffusion  
. self diffusion (solid state)  
. self propagation  
. species diffusion  
. surface diffusion  
. thermal diffusion

. turbulent diffusion  
RT ∞ absorption  
adsorption  
air pollution  
atmospheric scattering  
chemical engineering  
circulation  
convection-diffusion equation  
dehumidification  
dialysis  
∞ diffusers  
diffusion length  
diffusivity  
dilution  
dispersing  
∞ dispersion  
dissipation  
dissolving  
distillation  
drying  
∞ effects  
Einstein equations  
∞ equilibrium  
evaporation  
extraction  
Ficks equation  
gas-metal interactions  
kinetic theory  
mixing  
nonpoint sources  
osmosis  
penetration  
percolation  
permeability  
permeating  
∞ propagation  
radial flow  
reflection  
scattering  
self absorption  
∞ separation  
sound propagation  
sound waves  
spraying  
spreading  
sublimation  
surface properties  
thermophoresis  
transport properties

*diffusion bonding*

USE **diffusion welding**

### diffusion coefficient

DEF The absolute value of the ratio of the molecular flux per unit area to the concentration gradient of a gas diffusing through a gas or a porous medium where the molecular flux is evaluated across a surface perpendicular to the direction of the concentration gradient.

GS coefficients  
. **diffusion coefficient**  
. . Soret coefficient  
transport properties  
. **diffusion coefficient**  
. . Soret coefficient  
RT attenuation coefficients  
convection-diffusion equation  
∞ equilibrium  
Ficks equation  
gaseous diffusion  
Lewis numbers  
mass flow rate  
molecular diffusion  
particle diffusion  
reaction-diffusion equations

*diffusion effect*

USE **diffusion**

### diffusion electrodes

GS electrodes  
. **diffusion electrodes**  
RT electrolytic cells  
semiconductor devices

### diffusion flames

GS flames  
. **diffusion flames**  
RT boundary layer combustion

- combustion
- Damkohler number
- diffusion length**
  - GS dimensions
  - . length
  - . . **diffusion length**
  - distance
  - . **diffusion length**
  - RT carrier transport (solid state)
  - diffusion
  - electron diffusion
  - minority carriers
  - particle diffusion
  - semiconductor devices
  - solar cells
- diffusion pumps**
  - GS pumps
  - . **diffusion pumps**
  - RT vacuum apparatus
  - vacuum pumps
- diffusion theory**
  - RT Einstein equations
  - Fokker-Planck equation
  - Jacobi integral
  - kinetic theory
  - Kirkendall effect
  - Monte Carlo method
  - ∞ theories
  - transport theory
- diffusion waves**
  - RT elastic waves
  - electron diffusion
  - electrostatic waves
  - ionic diffusion
  - kinetic theory
  - molecular diffusion
  - plasma diffusion
  - plasma waves
- diffusion welding**
  - UF *diffusion bonding*
  - GS welding
  - . pressure welding
  - . . **diffusion welding**
  - RT bonding
  - burners
  - Kirkendall effect
  - metal bonding
  - metal-metal bonding
- diffusion-convection equation*
- USE **convection-diffusion equation**
- diffusivity**
  - DEF A measure of the rate of diffusion of a substance, expressed as the diffusivity coefficient K.
  - RT diffusion
  - fluid mechanics
  - impedance
  - Kirkendall effect
  - mobility
  - NDM semiconductor devices
  - permeability
  - ∞ physical properties
  - ∞ resistance
  - solubility
  - thermodynamic properties
- difluorides**
  - GS halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . **difluorides**
  - . . . . calcium fluorides
  - . . . . . fluorspar
  - . halides
  - . . fluorides
  - . . . **difluorides**
  - . . . . calcium fluorides
  - . . . . . fluorspar
- difluoro compounds**
  - GS halogen compounds
  - . fluorine compounds
  - . . fluoro compounds
- . . . **difluoro compounds**
- . . . . perfluoroalkane
- . . . . . polytetrafluoroethylene
- . . . . . teflon (trademark)
- RT ∞ chemical compounds
- difluorourea**
  - GS nitrogen compounds
  - . amides
  - . . ureas
  - . . . **difluorourea**
  - organic compounds
  - . amines
  - . . **difluorourea**
- digesting**
  - RT eating
  - enzymology
  - ∞ food
  - lysine
  - mastication
  - physiology
  - softening
- digestive system**
  - GS anatomy
  - . **digestive system**
  - . . esophagus
  - . . gastrointestinal system
  - . . . appendix (anatomy)
  - . . . intestines
  - . . . . rectum
  - . . . . stomach
  - . . mouth
  - . . lips (anatomy)
  - . . pancreas
  - . . salivary glands
  - . . teeth
  - . . tongue
  - RT abdomen
  - enzyme activity
  - enzymology
  - gall
  - organs
  - saliva
  - ∞ systems
- digital cameras**  
(added July 1998)
  - GS optical equipment
  - . cameras
  - . . **digital cameras**
  - photographic equipment
  - . cameras
  - . . **digital cameras**
  - RT CCD cameras
  - digital systems
  - digital techniques
  - photogrammetry
  - television cameras
  - video equipment
- digital circuits*
- USE **digital electronics**
- digital command systems**
  - RT numerical control
  - remote control
  - servocontrol
  - ∞ systems
- digital communication*
- USE **pulse communication**
- digital computers**
  - DEF Computers which operate with information, numerical or otherwise, represented in a digital form.
  - GS data processing equipment
  - . computers
  - . . **digital computers**
  - . . . CDC 160-A computer
  - . . . CDC 1604 computer
  - . . . CDC 3100 computer
  - . . . CDC 3200 computer
  - . . . CDC 3600 computer
  - . . . CDC 3800 computer
  - . . . CDC 6000 series computers
  - . . . . CDC 6400 computer
  - . . . . CDC 6600 computer
  - . . . . CDC 6700 computer
  - . . . . CDC 7000 series computers
  - . . . . CDC 7600 computer
  - . . . . CDC 8090 computer
  - . . . . CDC Cyber 170 series computers
  - . . . . CDC Cyber 175 computer
  - . . . . CDC Cyber 74 computer
  - . . . . CDC Cyber 174 computer
  - . . . . CDC Cyber 203 computer
  - . . . . CDC Cyber 205 computer
  - . . . . CDC Star 100 computer
  - . . . . EAI 680 computer
  - . . . . EAI 8400 computer
  - . . . . EAI 8900 computer
  - . . . . EMR 6050 computer
  - . . . . Ferranti Mercury computer
  - . . . . GE computers
  - . . . . GE 625 computer
  - . . . . GE 635 computer
  - . . . . Hewlett-Packard computers
  - . . . . Honeywell computers
  - . . . . . DDP 516 computer
  - . . . . . Honeywell 600/6000 computer
  - . . . . . Honeywell ADEPT computer
  - . . . . . Honeywell DDP 116 computer
  - . . . . IBM 360 computer
  - . . . . IBM 370 computer
  - . . . . IBM 650 computer
  - . . . . IBM 704 computer
  - . . . . IBM 709 computer
  - . . . . IBM 1130 computer
  - . . . . IBM 1401 computer
  - . . . . IBM 1410 computer
  - . . . . IBM 1620 computer
  - . . . . IBM 2250 computer
  - . . . . IBM 7030 computer
  - . . . . IBM 7040 computer
  - . . . . IBM 7044 computer
  - . . . . IBM 7070 computer
  - . . . . IBM 7074 computer
  - . . . . IBM 7090 computer
  - . . . . IBM 7094 computer
  - . . . . ICL computers
  - . . . . Iliac computers
  - . . . . . Iliac 3 computer
  - . . . . . Iliac 4 computer
  - . . . . microcomputers
  - . . . . . personal computers
  - . . . . . . IBM personal computers
  - . . . . . . Macintosh personal computers
  - . . . . minicomputers
  - . . . . . Nova computers
  - . . . . . Modcomp II computer
  - . . . . . Modcomp IV computer
  - . . . . . parallel computers
  - . . . . . . massively parallel processors
  - . . . . . . . Connection Machine
  - . . . . . . . MIMD (computers)
  - . . . . . . . SIMD (computers)
  - . . . . . PDP 15 computer
  - . . . . . PDP computers
  - . . . . . . PDP 7 computer
  - . . . . . . PDP 8 computer
  - . . . . . . PDP 9 computer
  - . . . . . . PDP 10 computer
  - . . . . . . PDP 11 computer
  - . . . . . . PDP 11/20 computer
  - . . . . . . PDP 11/40 computer
  - . . . . . . PDP 11/45 computer
  - . . . . . . PDP 11/50 computer
  - . . . . . . PDP 11/70 computer
  - . . . . . . PDP 12 computer
  - . . . . . . Philco 2000 computer
  - . . . . . Raytheon computers
  - . . . . . RCA spectra 70 computer
  - . . . . . SDS 900 series computers
  - . . . . . . SDS 930 computer
  - . . . . . . SDS 9300 computer
  - . . . . . . SEL computers
  - . . . . . . sequential computers
  - . . . . . . SIGMA 5 computer
  - . . . . . . SIGMA computers
  - . . . . . . . SIGMA 9 computer
  - . . . . . . Solomon computers
  - . . . . . . . Univac 1100 series computers
  - . . . . . . . . Univac 1105 computer
  - . . . . . . . . Univac 1106 computer
  - . . . . . . . . Univac 1107 computer
  - . . . . . . . . Univac 1108 computer

## digital data

- . . . . Univac 1110 computer
- . . . . Univac 80 computer
- . . . . Univac 418 computer
- . . . . Univac 490 computer
- . . . . Univac 494 computer
- . . . . Univac 1230 computer
- . . . . Univac Larc computer
- . . . . VAX computers
- . . . . VAX-11 series computers
- . . . . VAX-11/780 computer
- RT analog computers
- analog to digital converters
- associative processing (computers)
- CDC computers
- computer compatible tapes
- computer program integrity
- computer programs
- computer systems programs
- data processing
- DDP computers
- differential analyzers
- hybrid computers
- IBM computers
- logic circuits
- Turing machines
- Univac computers

### digital data

- GS **digital data**
- . digital elevation models
- RT analog data
- binary data
- ∞ data
- data converters
- data processing
- video compression
- video data

### digital electronics

DEF The use of circuits in which there are usually only two states possible at any point. The two states can represent any of a variety of binary digits (bits) of information. Used for digital circuits.

- UF *digital circuits*
- RT analog to digital converters
- binary digits
- circuits
- computer components
- digital systems
- digital techniques
- digital to analog converters
- ∞ electronics
- logical elements

### digital elevation models

(added September 2002)

DEF Digital data files consisting of terrain elevations for ground positions at regularly spaced horizontal intervals.

- GS digital data
- . **digital elevation models**
- models
- . **digital elevation models**
- RT elevation
- radar maps
- relief maps
- satellite altimetry
- terrain
- terrain analysis
- topography

### digital filters

DEF Computational means of attenuating undesired frequencies in sets of time-dependent data.

- GS electromagnetic wave filters
- . electric filters
- . . **digital filters**
- . . . FIR filters
- . . . IIR filters
- RT ∞ filters
- microwave filters

### digital integrators

- GS circuits
- . **digital integrators**
- integrators
- . **digital integrators**
- RT binary integration

- differential analyzers
- functional integration
- numerical integration

### digital navigation

- GS digital systems
- . **digital navigation**
- navigation
- . **digital navigation**
- RT air navigation
- dead reckoning
- inertial navigation
- polar navigation
- space navigation
- surface navigation

### digital radar systems

- GS digital systems
- . **digital radar systems**
- RT airborne radar
- antiradiation missiles
- data processing equipment
- radar detection
- radar equipment
- radar receivers
- radar scanning
- radar targets
- radar tracking
- radar transmission
- signal analysis
- surveillance radar
- tracking radar

### digital simulation

- GS models
- . mathematical models
- . . **digital simulation**
- simulation
- . computerized simulation
- . . **digital simulation**
- RT analog simulation
- biological models (mathematics)
- computer systems simulation
- war games

### digital spacecraft television

- GS communication equipment
- . spacecraft television
- . . **digital spacecraft television**
- telecommunication
- . pulse communication
- . . **digital spacecraft television**
- . spacecraft television
- . . **digital spacecraft television**
- television systems
- . digital television
- . . **digital spacecraft television**
- . spacecraft television
- . . **digital spacecraft television**
- RT wireless communication

### digital systems

- UF *binary systems (digital)*
- ternary systems (digital)*
- GS **digital systems**
- . digital navigation
- . digital radar systems
- RT analog to digital converters
- binary codes
- binary digits
- biternary code
- data systems
- digital cameras
- digital electronics
- ∞ systems
- systems integration
- telecommunication

### digital techniques

- RT BCH codes
- bistable circuits
- coding
- computer programming
- digital cameras
- digital electronics
- error correcting codes
- error detection codes
- ∞ methodology
- numerical control
- shift registers

- terminal area energy management
- vector quantization

### digital television

DEF Television in which picture redundancy is reduced or eliminated by transmitting only the data needed to define motion in the picture, as represented by changes in the areas of continuous white or black.

- GS television systems
- . **digital television**
- . . digital spacecraft television
- RT high definition television
- pulse communication
- television transmission
- video compression

### digital to analog converters

- GS data converters
- . **digital to analog converters**
- RT analog to digital converters
- ∞ converters
- digital electronics
- peripheral equipment (computers)
- plotters
- signal encoding
- x-y plotters

### digital to voice translators

- UF *DIVOT (voice translators)*
- RT computers
- ∞ translators
- vocoders
- voice data processing

### digital transducers

- GS transducers
- . **digital transducers**
- RT interdigital transducers

### digitalis

- GS drugs
- . **digitalis**

### digitizers

USE **analog to digital converters**

### digits

- SN (EXCLUDES FINGERS AND TOES)
- GS symbols
- . alphanumeric characters
- . . **digits**
- . . . binary digits
- RT ∞ codes
- decimals
- integers
- number theory
- ∞ numbers

### dihedral angle

- GS geometry
- . Euclidean geometry
- . . angles (geometry)
- . . . **dihedral angle**
- RT lateral stability

### dihedral effect

USE **lateral stability**

### dihydrazine

- GS hydrazines
- . **dihydrazine**

### dihydrides

- GS hydrogen compounds
- . hydrides
- . . **dihydrides**

### dihydroxyphenylalanine

USE **dopa**

### diisocyanates

- GS esters
- . isocyanates
- . . **diisocyanates**
- nitrogen compounds
- . cyano compounds
- . . isocyanates

- . . . **diisocyanates**
- dikes (geology)*
- USE **rock intrusions**
- dilatation*
- USE **stretching**
- dilatational waves**
- GS elastic waves
- . **dilatational waves**
- RT longitudinal waves
- P waves
- S waves
- seismic waves
- ∞ shear
- stretching
- ∞ waves
- dilatometers*
- USE **extensometers**
- dilatometry**
- RT extensometers
- ∞ measurement
- thermal expansion
- diluents**
- RT additives
- ∞ agents
- combustion products
- contaminants
- dispersions
- exhaust gases
- solvents
- dilution**
- GS **dilution**
- . geometric dilution of precision
- RT attenuation
- concentration (composition)
- diffusion
- dispersing
- disposal
- dissipation
- dissolving
- low concentrations
- mixing
- purity
- ∞ reduction
- waste disposal
- dimenhydrinate**
- GS drugs
- . antihistaminics
- . . **dimenhydrinate**
- organic compounds
- . amines
- . . **dimenhydrinate**
- . cyclic compounds
- . . heterocyclic compounds
- . . . **dimenhydrinate**
- dimensional analysis**
- RT ∞ applications of mathematics
- aspect ratio
- dimensionless numbers
- dimensions
- fibers (mathematics)
- fineness ratio
- fluid flow
- parameterization
- scaling laws
- similarity numbers
- thickness ratio
- units of measurement
- dimensional measurement**
- RT deformeters
- distance measuring equipment
- ellipsometry
- ∞ measurement
- micrometers
- size determination
- dimensional stability**
- GS mechanical properties
- . **dimensional stability**
- . . structural stability
- . . . shell stability
- stability
- . static stability
- . . **dimensional stability**
- . . . structural stability
- . . . . shell stability
- RT aspect ratio
- creep properties
- curl (materials)
- dynamic stability
- Roche limit
- thermal stability
- tolerances (mechanics)
- dimensionless numbers**
- GS **dimensionless numbers**
- . Biot number
- . Froude number
- . Grashof number
- . Hartmann number
- . Laval number
- . Lewis numbers
- . Mach number
- . mixing ratios
- . Nusselt number
- . Peclet number
- . Prandtl number
- . Rayleigh number
- . Reynolds number
- . . high Reynolds number
- . . low Reynolds number
- . Bond number
- . Brinkman number
- . Richardson number
- . Schmidt number
- . similarity numbers
- . Stanton number
- . Strouhal number
- RT dimensional analysis
- fluid flow
- heat transfer
- ∞ numbers
- scaling laws
- dimensions**
- GS **dimensions**
- . depth
- . diameters
- . film thickness
- . fractals
- . height
- . . scale height
- . length
- . . diffusion length
- . radii
- . . Larmor radius
- . target thickness
- . width
- RT amplitudes
- ∞ design
- dimensional analysis
- distance
- drawings
- engineering drawings
- fineness ratio
- geometry
- magnitude
- particle size distribution
- relativistic effects
- ∞ span
- thickness
- topology
- units of measurement
- volume
- dimercaprol**
- GS sulfur compounds
- . thiols
- . . **dimercaprol**
- dimerization**
- GS synthesis (chemistry)
- . polymerization
- . . **dimerization**
- RT copolymerization
- dimers**
- GS oligomers
- . **dimers**
- prepolymers
- . **dimers**
- RT monomers
- trimers
- dimethyl compounds**
- (added July 1992)
- GS organic compounds
- . **dimethyl compounds**
- . . dimethylhydrazines
- RT methyl compounds
- trimethyl compounds
- dimethylhydrazines**
- GS hydrazines
- . **dimethylhydrazines**
- organic compounds
- . amines
- . . **dimethylhydrazines**
- . dimethyl compounds
- . . **dimethylhydrazines**
- RT aeroxine
- methylhydrazine
- monomethylhydrazines
- diminution*
- USE **reduction**
- dimming**
- RT brightness
- light emission
- ∞ reduction
- dimpling**
- RT bulging
- metal working
- stamping
- Dining Philosophers Problem**
- RT distributed processing
- interprocessor communication
- problem solving
- synchronism
- dinitrates**
- GS nitrogen compounds
- . nitrates
- . . **dinitrates**
- diodes**
- UF *p-i-n diodes*
- GS electronic equipment
- . **diodes**
- . . crystal rectifiers
- . . plasma diodes
- . . semiconductor diodes
- . . . avalanche diodes
- . . . . cryosar
- . . . Barritt diodes
- . . . germanium diodes
- . . . Gunn diodes
- . . . . transferred electron devices
- . . . junction diodes
- . . . . MIM diodes
- . . . . step recovery diodes
- . . . light emitting diodes
- . . . parametric diodes
- . . . photodiodes
- . . . Schottky diodes
- . . . tunnel diodes
- . . . . resonant tunneling diodes
- . . . varactor diodes
- . . thermionic diodes
- . . . cesium diodes
- RT electron tubes
- ion implantation
- p-i-n junctions
- rectifiers
- semiconductor devices
- solions
- TRAPATT devices
- triodes
- varactor diode circuits
- Diode-Transistor-Logic integ circuits*
- USE **DTL integrated circuits**
- Dione**
- DEF One of the natural satellites of Saturn orbiting at a mean distance of 378,000 kilometers.
- GS celestial bodies
- . natural satellites

## diophantine equation

- . . icy satellites
  - . . . **Dione**
  - . . Saturn satellites
  - . . . **Dione**
- RT Saturn (planet)

### diophantine equation

- GS number theory  
. diophantine equation
- RT  $\infty$  equations

### diorite

- GS rocks  
. igneous rocks
- . . **diorite**
- RT minerals  
soils

### dioxides

- GS chalcogenides  
. oxides
- . . **dioxides**
  - . . . carbon dioxide
  - . . . flint
  - . . . hydrogen peroxide
  - . . . silicon dioxide
  - . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
  - . . . sulfur dioxides
- RT Karl Fischer reagent  
peroxides  
sulfur oxides  
thorium oxides  
titanium oxides

### diphenyl compounds

- GS organic compounds  
. hydrocarbons
- . . **diphenyl compounds**
  - . . . diphenyl hydantoin
- RT  $\infty$  chemical compounds

### diphenyl hydantoin

- GS drugs  
. antihistaminics
- . . **diphenyl hydantoin**
- organic compounds  
. amines
- . . **diphenyl hydantoin**
- . hydrocarbons  
. diphenyl compounds  
. . **diphenyl hydantoin**

### diphosphates

- GS phosphorus compounds  
. phosphates
- . . **diphosphates**
  - . . . adenosine diphosphate

### diphtheria

- GS diseases  
. infectious diseases
- . . bacterial diseases
  - . . . **diphtheria**
- RT toxic diseases

### diplexers

- GS antenna components  
. antenna couplers
- . . **diplexers**
- circuits  
. **diplexers**  
communication equipment  
. **diplexers**  
couplers  
. antenna couplers
- . . **diplexers**
- RT couples  
radar antennas  
radar equipment  
television equipment  
transformers

### dipolar ions

- (added October 2001)  
USE **zwitterions**

### dipole antennas

- SN (SINGLE DIPOLE ANTENNAS)  
DEF A straight radiator, usually fed in the

center, and producing a maximum of radiation in the plane normal to its axis. The length specified is the overall length. SN (single dipole antennas)

- GS antennas  
. directional antennas
- . . **dipole antennas**
- RT antenna arrays  
antenna design  
backfire antennas  
 $\infty$  dipoles  
directors (antenna elements)  
lens antennas  
linear arrays  
log periodic antennas  
log spiral antennas  
monopole antennas  
omnidirectional antennas  
parasitic elements (antennas)  
radar antennas  
turnstile antennas  
Yagi antennas

### dipole moments

- GS moments  
. **dipole moments**
- . . electric moments
  - . . magnetic moments
- RT domains  
electrical properties  
magnetic domains  
magnetic properties  
Van der Waals forces

### $\infty$ dipoles

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF Systems composed of two, separated, equal electric or magnetic charges of opposite sign.
- RT dipole antennas  
electric charge  
electric dipoles  
magnetic dipoles  
magnetic poles  
monopoles  
orbiting dipoles  
polarity
- $\infty$  poles  
quadrupoles  
zwitterions

### dipping

- RT baths  
coatings  
quenching (cooling)  
submerging  
wetting

### Dirac equation

- GS wave equations  
. **Dirac equation**
- RT  $\infty$  equations  
field theory (physics)  
Klein-Gordon equation  
Lorentz transformations  
quantum theory

### direct broadcast satellites

DEF Domestic satellites used for direct TV transmission to home receivers. Used for DBS (satellites).

- UF *DBS (satellites)*  
GS artificial satellites  
. communication satellites
- . . **direct broadcast satellites**
- RT broadcasting  
domestic satellite communications systems  
satellite television  
satellite transmission  
space commercialization  
space law  
telecommunication  
television transmission

### direct current

- UF *DC (current)*  
GS electric current  
. **direct current**
- RT alternating current

current converters (AC to DC)  
homopolar generators  
inverted converters (DC to AC)  
voltage converters (DC to DC)

### direct current generators

- USE **DC generators**

### direct lift controls

- RT  $\infty$  control  
lift devices

### direct numerical simulation

(added October 1997)  
DEF A computationally intensive numerical approach used in computational fluid dynamics, which leads to the nearly exact solution of a system of nonlinear, unsteady, time-dependent, three-dimensional equations. Applications include aerodynamics, turbulent combustion, energy transfer theory and non-Newtonian effects.

UF *DNS (numerical analysis)*

- GS analysis (mathematics)  
. numerical analysis
- . . **direct numerical simulation**
- simulation

### direct numerical simulation

- RT computational fluid dynamics  
low Reynolds number  
Navier-Stokes equation  
reacting flow  
turbulent flow

### direct power generators

- UF *energy converters*  
GS electric generators
- . **direct power generators**
  - . . DC generators
  - . . . homopolar generators
  - . . electrostatic generators
  - . . fuel cells
  - . . . biochemical fuel cells
  - . . . hydrogen oxygen fuel cells
  - . . . molten carbonate fuel cells
  - . . . phosphoric acid fuel cells
  - . . . regenerative fuel cells
  - . . . solid oxide fuel cells
  - . . magnetohydrodynamic generators
  - . . photoelectric generators
  - . . . photovoltaic cells
  - . . . solar cells
  - . . . . . vertical junction solar cells
  - . . primary batteries
  - . . . alkaline batteries
  - . . . dry cells
  - . . . . . magnesium cells
  - . . . . . nickel zinc batteries
  - . . . metal air batteries
  - . . . . . zinc-oxygen batteries
  - . . . sodium sulfur batteries
  - . . thermal batteries
  - . . radioisotope batteries
  - . . . SNAP 7
  - . . . SNAP 9A
  - . . . SNAP 11
  - . . . SNAP 13
  - . . . SNAP 15
  - . . . SNAP 17
  - . . . SNAP 19
  - . . . SNAP 21
  - . . . SNAP 23
  - . . . SNAP 27
  - . . . SNAP 29
  - . . thermionic converters
  - . . . SNAP 13
  - . . . solar blankets
  - . . thermoelectric generators
  - . . . SNAP 3
  - . . . SNAP 7
  - . . . SNAP 9A
  - . . . SNAP 10A
  - . . . SNAP 11
  - . . . SNAP 15
  - . . . SNAP 17
  - . . . SNAP 19
  - . . . SNAP 21
  - . . . SNAP 23
  - . . . SNAP 27
  - . . . SNAP 29
  - . . . solar sea power plants

- RT auxiliary power sources  
 ∞ converters  
   electric batteries  
 ∞ electric cells  
   electric energy storage  
   energy absorption films  
   energy conversion  
   energy conversion efficiency  
 ∞ generators  
   heat generation  
   photoelectric cells  
   solar generators  
   solar total energy systems  
   spacecraft power supplies
- ∞ **direction**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT autonomy  
   azimuth  
   bearing (direction)  
   directivity  
   line of sight  
   management  
   reversing
- direction finders (radio)*  
 USE **radio direction finders**
- direction finding**  
 DEF A procedure or process for locating or localizing the origin of radar, acoustical, or optical emissions.  
 RT bearing (direction)  
   radio direction finders  
   signal processing
- directional antennas**  
 DEF Antennas that radiate or receive radio signals more efficiently in some directions than in others. Used for tracking antennas.  
 UF *tracking antennas*  
 GS antennas  
   . **directional antennas**  
   . . dipole antennas  
   . . helical antennas  
   . . horn antennas  
   . . lens antennas  
   . . log periodic antennas  
   . . loop antennas  
   . . radar antennas  
   . . . radant  
   . . reflector antennas  
   . . . parabolic antennas  
   . . . two reflector antennas  
   . . rhombic antennas  
   . . slot antennas  
   . . steerable antennas  
   . . . inertialess steerable antennas  
   . . Yagi antennas  
 RT antenna arrays  
   antenna gain  
   antenna radiation patterns  
   backlobes  
   boresight error  
   boresights  
   endfire arrays  
   microwave antennas  
   microwave coupling  
   missile antennas  
   monopulse antennas  
   omnidirectional antennas  
   parasitic elements (antennas)  
   radio antennas  
   Sommerfeld approximation
- directional control**  
 UF *vector control*  
 GS attitude control  
   . **directional control**  
   . . thrust vector control  
 RT aircraft control  
   automatic control  
 ∞ control  
   helicopter control  
   jet control  
   lateral control  
   longitudinal control  
   manual control
- missile control  
 ∞ reaction control  
   rocket engine control  
   satellite attitude control  
   satellite control  
   yaw
- directional couplers**  
 GS antenna components  
   . antenna couplers  
   . . **directional couplers**  
   couplers  
   . antenna couplers  
   . . **directional couplers**  
 RT coupling  
   couplings  
   impedance matching  
   microstrip transmission lines  
   microwave coupling  
   transmission lines  
   yokes
- directional solidification (crystals)**  
 DEF Controlled solidification (crystal growth) of molten metal in a casting so as to provide feed metal to the solidifying front of the casting.  
 GS crystallization  
   . **directional solidification (crystals)**  
   growth  
   . crystal growth  
   . . **directional solidification (crystals)**  
   solidification  
   . **directional solidification (crystals)**  
 RT containerless melts  
   eutectic composites  
   phase transformations
- directional stability**  
 DEF The property of an aircraft, rocket, etc., enabling it to restore itself from a yawing or sideslipping condition.  
 GS dynamic characteristics  
   . dynamic stability  
   . . motion stability  
   . . . attitude stability  
   . . . . **directional stability**  
   . . . . . gyroscopic stability  
   stability  
   . dynamic stability  
   . . motion stability  
   . . . attitude stability  
   . . . . **directional stability**  
   . . . . . gyroscopic stability  
 RT aerodynamic stability  
   aircraft stability  
   controllability  
   flow stability  
   horizontal orientation  
   hovering stability  
   lateral oscillation  
   lateral stability  
   longitudinal stability  
   rotary stability  
   spacecraft stability  
   stability augmentation  
   vertical orientation  
   yaw
- directivity**  
 DEF The ability of an antenna to radiate or receive more energy in some directions.  
 RT alignment  
   anisotropy  
   collimation  
   crystallography  
 ∞ direction  
   field strength  
   instrument orientation  
   isotropy  
   look angles (electronics)  
 ∞ orientation
- directories**  
 DEF Alphabetical, geographical, or classified listings by field of persons, organizations, programs and/or objects such as instruments, devices, and products. Use of this term excludes directories in computers.
- RT handbooks  
 manuals
- directors (antenna elements)**  
 GS antenna components  
   . parasitic elements (antennas)  
   . . **directors (antenna elements)**  
   antennas  
   . parasitic elements (antennas)  
   . . **directors (antenna elements)**  
 RT dipole antennas  
   radio receivers  
   reflectometers  
   reflectors  
   rods  
   Yagi antennas
- Dirichlet problem**  
 GS boundary value problems  
   . **Dirichlet problem**  
 RT differential equations  
   hyperbolic differential equations  
 ∞ problems
- dirigibles*  
 USE **airships**
- dirt**  
 GS soils  
   . **dirt**  
 RT contaminants  
   dust  
   impurities  
   particles  
   rocks
- DIS*  
 (added December 1996)  
 USE **distributed interactive simulation**
- disabilities**  
 UF *handicaps*  
 RT auditory defects  
   blindness  
   frustration  
 ∞ inhibition  
   paralysis  
   wheelchairs
- disarmament**  
 RT armed forces (foreign)  
   armed forces (United States)  
   international cooperation  
   weapons
- disasters**  
 DEF Large-scale drought, glacier movement, floods, fires, storms, etc.  
 RT accidents  
   casualties  
   emergencies  
   first aid  
   sabotage
- ∞ **discharge**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT detonation  
   dispersing  
   disposal  
   drainage  
   effluents  
   ejection  
   electric discharges  
   electrodeless discharges  
   elimination  
   emission  
   exhausting  
   expellants  
   explosions  
   outlets  
   releasing  
   relieving  
   ring discharge  
   unloading  
   venting
- discharge coefficient**  
 GS coefficients  
   . flow coefficients



## dischargers

- . . **discharge coefficient**
- RT axial flow
- flow velocity
- influence coefficient
- mass flow factors
- nozzle flow
- nozzle geometry
- nozzle thrust coefficients
- wall flow

### *discharge tubes*

USE **gas discharge tubes**

## dischargers

- GS **dischargers**
  - . static dischargers
- RT dissipation
- neutralizers

## disciplining

- RT liabilities
- morale
- penalties

## discoloration

- RT color
- damage
- degradation
- fading
- staining

## disconnect devices

- UF *disconnectors*
- RT circuit breakers
- connectors
- decoupling
- dumping
- ejection
- electric connectors
- electric fuses
- electric relays
- ∞ relay
- releasing

### *disconnectors*

USE **disconnect devices**

## discontinuity

DEF A break in sequence or continuity of anything.

- GS **discontinuity**
  - . shock discontinuity
- RT analysis (mathematics)
- catastrophe theory
- Gibbs phenomenon
- incoherence
- vortex streets

## Discos (satellite attitude control)

DEF A satellite orbit "Disturbance COmpensation System" designed to maintain an object (proof object) in correct orbit by detecting forces and compensating for them by using thrusters.

- RT attitude stability
- Nova satellites
- satellite perturbation
- spacecraft stability
- Transit satellites

## Discoverer recovery capsules

- UF *DRC (capsule)*
- GS space capsules
- . **Discoverer recovery capsules**
- RT recovery parachutes
- spacecraft recovery

## Discoverer satellites

- GS artificial satellites
- . **Discoverer satellites**
- RT Agena A rocket vehicle
- Agena B rocket vehicle
- Agena rocket vehicles
- Thor Agena launch vehicle

### *discovering*

USE **exploration**

## Discovery (Orbiter)

- UF *Space Shuttle Orbiter 103*
- GS manned spacecraft
- . space shuttles

- . . Space Shuttle orbiters
- . . . **Discovery (Orbiter)**
- reentry vehicles
- . recoverable spacecraft
- . . reusable spacecraft
- . . . space shuttles
- . . . . Space Shuttle orbiters
- . . . . . **Discovery (Orbiter)**
- RT manned space flight
- Space Shuttle mission 41-D
- Space Shuttle mission 51-A
- Space Shuttle mission 51-C
- Space Shuttle mission 51-D
- Space Shuttle mission 51-G
- Space Shuttle mission 51-I
- ∞ spacecraft

## discrete address beacon system

DEF Radar beacon system with discretely addressable transponders and a ground-air-ground data link for automated air traffic control (FAA).

- GS landing aids
- . airport beacons
- . . **discrete address beacon system**
- navigation aids
- . beacons
- . . airport beacons
- . . . **discrete address beacon system**
- . . radar beacons
- . . . **discrete address beacon system**
- radar equipment
- . radar beacons
- . . **discrete address beacon system**
- RT air traffic control
- data links
- ground-air-ground communication
- secondary radar
- ∞ systems

## discrete cosine transform

(added March 1994)

- UF *DCT (mathematics)*
- GS transformations (mathematics)
- . **discrete cosine transform**
- RT data compression
- discrete functions
- image processing
- signal processing
- video compression

## discrete functions

- GS functions (mathematics)
- . **discrete functions**
- RT discrete cosine transform
- discretization (mathematics)
- distribution functions
- histograms
- normal density functions
- Poisson density functions
- probability density functions
- probability distribution functions
- statistical analysis

## discretization (mathematics)

(added June 1997)

- GS analysis (mathematics)
- . numerical analysis
- . . approximation
- . . . **discretization (mathematics)**
- RT discrete functions

## discriminant analysis (statistics)

DEF A linear combination of a set of N variables that will classify (into two different classes) the events or items for which the measurements of the N variables are available, with the smallest proportion of misclassifications. Used for discriminant functions.

- UF *discriminant functions*
- GS functions (mathematics)
- . **discriminant analysis (statistics)**
- statistical analysis
- . **discriminant analysis (statistics)**
- RT ∞ classifying
- multivariate statistical analysis
- populations

temporal logic

### *discriminant functions*

USE **discriminant analysis (statistics)**

## discrimination

- GS **discrimination**
  - . sensory discrimination
  - . . brightness discrimination
  - . . tactile discrimination
  - . . visual discrimination
  - . spectral mixture analysis
- RT acuity
- comparator circuits
- ∞ differentiation
- selectivity
- signal detection
- signal detectors
- target recognition

## discriminators

DEF In general, a circuit in which output depends upon the difference between an input signal and a reference signal.

- GS circuits
- . **discriminators**
- . . Fraunhofer line discriminators
- . . frequency discriminators
- RT analog computers
- anticoincidence detectors
- comparators
- error signals
- intermodulation
- RC circuits

## ∞ discussion

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT conferences
- evaluation
- examination
- reports
- reviewing

### *diseased vegetation*

USE **plant diseases**

## diseases

SN (RESTRICTED TO DISEASES IN ANIMALS INCLUDING MAN--FOR DISEASES IN PLANTS SEE PLANT DISEASES)

- GS **diseases**
  - . albinism
  - . anemias
  - . arteriosclerosis
  - . arthritis
  - . ataxia
  - . atelectasis
  - . bone demineralization
  - . colic
  - . cyanosis
  - . diabetes mellitus
  - . encephalitis
  - . epilepsy
  - . eye diseases
  - . . asthenopia
  - . . astigmatism
  - . . cataracts
  - . . conjunctivitis
  - . . glaucoma
  - . . keratitis
  - . . phoria
  - . fat embolisms
  - . fibrosis
  - . . cystic fibrosis
  - . . headache
  - . . heart diseases
  - . . angina pectoris
  - . . coronary artery disease
  - . . infarction
  - . . . myocardial infarction
  - . . infectious diseases
  - . . airborne infection
  - . . bacterial diseases
  - . . . cholera
  - . . . diphtheria
  - . . . keratitis
  - . . . syphilis
  - . . . tuberculosis
  - . . . typhoid

. . . typhus  
 . . . conjunctivitis  
 . . . dermatitis  
 . . . contact dermatitis  
 . . . fungal diseases  
 . . . hepatitis  
 . . . meningitis  
 . . . parasitic diseases  
 . . . viral diseases  
 . . . acquired immunodeficiency syndrome

. . . influenza  
 . . . poliomyelitis  
 . . . smallpox  
 . kidney diseases  
 . . kidney stones  
 . . nephritis  
 . lithiasis  
 . metabolic diseases  
 . narcolepsy  
 . neurasthenia  
 . neuritis  
 . occupational diseases  
 . osteoporosis  
 . paralysis  
 . Parkinson disease  
 . pulmonary lesions  
 . radiation sickness  
 . respiratory diseases  
 . . . aerosinusitis  
 . . . asthma  
 . . . emphysema  
 . . . influenza  
 . . . pneumonia  
 . . . tuberculosis  
 . rheumatic diseases  
 . tachycardia  
 . thrombopenia  
 . thrombosis  
 . tooth diseases  
 . toxic diseases  
 . . benzene poisoning  
 . . beryllium poisoning  
 . . carbon monoxide poisoning  
 . . carbon tetrachloride poisoning  
 . . hydrocarbon poisoning  
 . . lead poisoning  
 . tumors  
 . . neoplasms  
 . . . cancer  
 . . . . leukemias  
 . ulcers  
 . urolithiasis

RT animal models  
 chronic conditions  
 creatinine  
 cures  
 diagnosis  
 disorders  
 etiology  
 immunosuppression  
 medical science  
 necrosis  
 pathogenesis  
 pathological effects  
 plant diseases  
 pneumothorax  
 prophylaxis  
 signs and symptoms  
 symptomology  
 therapy  
 vaccines  
 veterinary medicine

*dishes*  
 USE **parabolic reflectors**

**disilicides**  
 GS silicon compounds  
 . silicides  
 . . **disilicides**  
 RT silanes  
 silicates

*disinfectants*  
 USE **antiseptics**

**disintegration**  
 RT atomizing  
 comminution

crushers  
 crushing  
 damage  
 decay  
 decomposition  
 deterioration  
 flaking  
 grinding (comminution)  
 ionization  
 lysogenesis

**disk galaxies**  
 DEF Galaxies consisting of a central bulge of a spheroidal aggregation of stars and a surrounding disk of stars fanning outward in a thin layer.  
 GS celestial bodies  
 . galaxies  
 . . **disk galaxies**  
 RT astrophysics  
 barred galaxies  
 blazars  
 elliptical galaxies  
 galactic clusters  
 galactic evolution  
 galactic halos  
 galactic nuclei  
 galactic rotation  
 galactic structure  
 local group (astronomy)  
 radio galaxies  
 spiral galaxies  
 star clusters  
 Virgo galactic cluster

**disk operating system (DOS)**  
*(added October 1988)*  
 DEF A program with which the computer performs such mundane but useful tasks as storing, locating, and retrieving files on disk, reading the keyboard, and issuing display and print information.  
 GS computer programs  
 . computer systems programs  
 . . operating systems (computers)  
 . . . **disk operating system (DOS)**  
 RT assembler routines  
 compilers  
 computer information security  
 computer systems design  
 ∞ disks  
 graphical user interface  
 input/output routines  
 magnetic disks  
 ∞ routines  
 ∞ systems

∞ **disks**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT actuator disks  
 disk operating system (DOS)  
 disks (shapes)  
 intervertebral disks  
 magnetic disks

**disks (shapes)**  
 GS **disks (shapes)**  
 . actuator disks  
 . intervertebral disks  
 . rotating disks  
 RT accretion disks  
 aerodynamic configurations  
 bodies of revolution  
 circular plates  
 ∞ disks  
 ∞ plates  
 video disks

**dislocations (materials)**  
 GS **dislocations (materials)**  
 . crystal dislocations  
 . . edge dislocations  
 . . screw dislocations  
 RT displacement  
 flow theory  
 ∞ materials

**disorders**  
 GS disorientation

. **disorders**  
 RT chronic conditions  
 depersonalization  
 ∞ depression  
 detachment  
 diseases  
 ∞ disturbances  
 dithers  
 emotional factors  
 human behavior  
 jet lag  
 psychology  
 psychoses  
 violence

**disorientation**  
 SN (EXCLUDES PHYSICAL OR MATHEMATICAL MISALIGNMENT)  
 GS **disorientation**  
 . desynchronization (biology)  
 . disorders  
 . jet lag  
 RT biological effects  
 Coriolis effect  
 detachment  
 dithers  
 dizziness  
 irrationality  
 misalignment  
 psychological effects  
 psychology  
 staggering  
 weightlessness

*dispatching*  
 USE **distributing**

**dispensers**  
 RT distributors  
 ejectors  
 feeders  
 materials handling  
 rollers  
 sprayers

**dispersing**  
 SN (OF MATERIALS OR PARTICLES)  
 RT agitation  
 assimilation  
 chemical release modules  
 circulation  
 cloud dispersal  
 colloid  
 deflection  
 diffusion  
 dilution  
 ∞ discharge  
 ∞ dispersion  
 dispersions  
 disposal  
 dissipation  
 distributing  
 ∞ distribution  
 entrainment  
 exhausting  
 fog dispersal  
 homogenizing  
 Langevin formula  
 permeating  
 pollution transport  
 ∞ reduction  
 releasing  
 scattering  
 ∞ separation  
 shaking  
 spraying  
 spreading  
 stirring  
 suspending (mixing)  
 swirling

∞ **dispersion**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT deviation  
 diffusion  
 dispersing  
 dispersions  
 dust  
 Kramers-Kronig formula

## dispersion strengthening

magnetic dispersion  
mixers  
random errors  
statistical analysis  
variability  
wave dispersion

*dispersion precipitation hardening*  
USE **precipitation hardening**

### dispersion strengthening

(added February 1994)

GS **dispersion strengthening**  
. oxide dispersion strengthening

RT alloys  
hardening (materials)  
heat resistant alloys  
∞ metallurgy  
∞ strength

### dispersions

DEF A two-phase system consisting of finely divided particles dispersed in a solid, liquid, or gas.

GS mixtures  
. **dispersions**  
. . colloids  
. . . aerosols  
. . . . fog  
. . . colloidal propellants  
. . emulsions  
. . . photographic emulsions  
. . . . nuclear emulsions  
. . liquid-gas mixtures  
. . . aerosols  
. . . . fog  
. . plastisols  
. . . smoke

RT Brownian movements  
colloidal generators  
crop dusting  
diluent  
dispersing  
∞ dispersion  
dust  
ferrofluids  
fog dispersal  
fumes  
mist  
particles  
particulates  
slurries  
slurry propellants  
suspending (mixing)  
∞ suspensions

### displacement

DEF A vector quantity that specifies the change of position of a body the change of position of a body or particle usually measured from the mean position or position of rest.

GS **displacement**  
. crack opening displacement

RT amplitudes  
bending  
bias  
boresight error  
deflection  
deformation  
dislocations (materials)  
distortion  
divergence  
engines  
flexible spacecraft  
heaving  
kinking  
level (quantity)  
magnitude  
∞ motion  
nutations  
positioning  
skewness  
temperature inversions  
variations  
vibration

### displacement measurement

SN (MEASUREMENT IN CHANGE OF POSITION)

GS mechanical measurement

### . displacement measurement

RT boresight error  
shearography

### display devices

UF *data readout systems*  
*display systems*  
*visual displays*

### GS display devices

. approach indicators  
. flat panel displays  
. flow direction indicators  
. . wind vanes  
. gyro horizons  
. head-up displays  
. helmet mounted displays  
. kinoforn  
. microvision landing aid  
. plasma display devices  
. position indicators  
. . plan position indicators  
. . radio direction finders  
. . spacecraft position indicators  
. radarscopes  
. . plan position indicators  
. speed indicators  
. . tachometers

RT airborne surveillance radar  
aircraft equipment  
aircraft instruments  
audio visual equipment  
automatic typewriters  
blinking  
cancellation circuits  
cathode ray tubes  
charts  
cockpit weather information systems  
computer graphics  
consoles  
control boards  
crew procedures (inflight)  
crew procedures (preflight)  
data recorders  
∞ detectors  
dials  
diffractive optics  
electrochromism  
flight control  
flight instruments  
flying spot scanners  
graphical user interface  
human-computer interface  
image reconstruction  
image tubes  
imagery  
images  
indicating instruments  
instrument landing systems  
instrument receivers  
∞ instruments  
light emitting diodes  
lists  
man machine systems  
map matching guidance  
monitors  
navigation aids  
perceptual errors  
photographs  
photopolymers  
picture tubes  
planetariums  
∞ plots  
plotters  
plotting  
printers (data processing)  
promotion  
radar  
radar resolution  
rapid ballistics identification  
raster scanning  
reading  
readout  
real time operation  
receivers  
remote consoles  
scientific visualization  
∞ screens  
situational awareness  
solar compasses

∞ strip  
∞ systems  
target simulators  
TERCOM  
video data  
video equipment  
viewing  
visual aids  
visual control  
warning systems

*display systems*

USE **display devices**

### disposal

#### GS disposal

. waste disposal  
. . composting  
. . hazardous material disposal (in space)

#### RT agitation

∞ containers  
decontamination  
deletion  
dilution  
∞ discharge  
dispersing  
dissipation  
distributing  
∞ distribution  
dumping  
ejection  
elimination  
emptying  
exhausting  
expulsion  
isolation  
jettisoning  
materials handling  
materials recovery  
removal  
sinks  
spreading  
∞ storage  
unloading

### disrupting

RT ∞ interference  
rupturing

### dissection

RT autopsies  
pathology

### dissipation

UF *dissipators*

#### GS dissipation

. energy dissipation  
. ohmic dissipation  
RT atmospheric turbulence  
attenuation  
damping  
decontamination  
depletion  
diffusion  
dilution  
dischargers  
dispersing  
disposal  
exhausting  
pollution  
purification  
∞ reduction  
removal  
waste disposal

*dissipators*

USE **dissipation**

### dissociation

DEF The separation of a complex molecule into constituents by collision with a second body, or by absorption of a photon. The product of dissociation of a molecule is two ions, one positively charged and one negatively charged. Used for molecular dissociation.

UF *molecular dissociation*

#### GS dissociation

. autoionization  
. biodegradability

- . gas dissociation
- . photodissociation
- . radiolysis
- . thermal dissociation
- RT atomic recombination
- chemical equilibrium
- Debye-Huckel theory
- decomposition
- electrodissolution
- heat of dissociation
- ionization
- molecular diffusion
- molecular interactions

*dissolution*USE **dissolving****dissolved gases**

DEF Gases in solution.  
 GS gases

- . **dissolved gases**

RT aeration  
 dissolving  
 mixtures  
 oxygenation  
 solubility  
 solutions

**dissolved organic matter***(added October 1997)*

UF *gelbstoff*

RT chlorophylls  
 organic solids  
 phytoplankton  
 sea water  
 sediments  
 solutes  
 water color  
 water pollution

**dissolving**

UF *dissolution*

GS mixing

- . **dissolving**

RT aeration  
 chemical attack  
 chemical cleaning  
 cleaning  
 compounding  
 corrosion  
 diffusion  
 dilution  
 dissolved gases  
 extraction  
 homogenizing  
 leaching  
 precipitation (chemistry)

∞ separation  
 softening  
 solubility  
 solutes

∞ solution  
 solvent retention  
 solvents  
 washing

*dissymmetry*USE **asymmetry****distance**

GS **distance**

- . Debye length
- . diffusion length
- . miss distance
- . optical slant range
- . radar range
- . radio range
- . range and range rate tracking
- . reentry range

RT aircraft performance  
 aircraft specifications  
 altitude  
 depth  
 dimensions  
 focusing  
 geometry  
 height  
 length  
 position (location)  
 proximity

radar navigation

∞ range

- range (extremes)
- takeoff runs

∞ travel

- Tully-Fisher relation

**distance measuring equipment**

DEF A radio aid to navigation which provides distance information by measuring total round trip time of transmission from an integrator to a transponder and return.

GS measuring instruments

- . **distance measuring equipment**
- . . . altimeters
- . . . . laser altimeters
- . . . . radio altimeters
- . . . geodimeters
- . . . range finders
- . . . . optical range finders
- . . . . . laser range finders
- . . . stadimeters
- . . . tellurometers

RT automatic flight control  
 automatic landing control  
 Decca navigation  
 depth measurement  
 dimensional measurement  
 LORAC navigation system  
 loran  
 lunar rangefinding  
 micrometers  
 navigation  
 navigation aids  
 omnidirectional radio ranges  
 position indicators  
 radar  
 radar equipment  
 radar measurement  
 radar navigation  
 radio navigation  
 range errors  
 Shoran  
 solar compasses  
 sonar  
 sound ranging

*distance perception*USE **space perception****distillation**

GS **distillation**

- . stripping (distillation)

RT chemical fractionation  
 concentrating  
 condensing  
 demineralizing  
 desalinization  
 diffusion  
 evaporation  
 flashing (vaporizing)  
 materials recovery  
 purging  
 purification  
 rectification  
 refining

∞ separation  
 tar sands  
 vaporizing  
 washing

**distillation equipment**

RT columns (process engineering)  
 condensers (liquefiers)

∞ equipment  
 stills

**distortion**

DEF An undesired change in waveform. In a system used for transmission or reproduction of sound, a failure by the system to transmit or reproduce a received waveform with exactness. An undesired change in the dimensions or shape of a structure as, distortion of a fuel tank due to abnormal stresses or extreme temperature gradients.

GS **distortion**

- . flow distortion
- . signal distortion
- . surface distortion

RT aberration  
 abnormalities  
 astigmatism  
 asymmetry  
 bending  
 buckling  
 camber  
 deflection  
 deformation  
 deviation  
 displacement  
 expansion  
 failure  
 flexing  
 folding  
 frequency pulling  
 geometric accuracy  
 ghosts  
 heaving  
 refraction  
 skewness  
 stretching  
 swelling  
 temperature inversions  
 twisting  
 variations  
 warpage  
 wrinkling

**distributed amplifiers**

GS amplifiers

- . **distributed amplifiers**

RT frequency response  
 transmission lines

*distributed Bragg reflector lasers*USE **DBR lasers****distributed feedback lasers**

DEF Lasers containing a periodic medium which provides the necessary feedback for laser action.

GS stimulated emission devices

- . lasers
- . . **distributed feedback lasers**

RT DBR lasers  
 feedback amplifiers  
 feedback control  
 heterojunction devices  
 laser outputs  
 lasing  
 semiconductor lasers  
 solid state lasers

**distributed interactive simulation***(added December 1996)*

SN ((Multiple simultaneous use of simulation in networks))

UF *D/S*

GS simulation

- . computerized simulation
- . . **distributed interactive simulation**

RT computer networks  
 distributed processing

**distributed memory***(added April 1997)*

GS memory (computers)

- . **distributed memory**

RT architecture (computers)  
 distributed processing  
 interprocessor communication  
 multiprocessing (computers)  
 parallel processing (computers)

**distributed parameter systems**

RT control theory  
 differential equations  
 independent variables  
 integral equations  
 linear circuits  
 linear systems  
 network analysis  
 nonlinear systems

∞ systems

**distributed processing**

DEF Processing with multiple small computers that are capable of operating independently but can communicate over a network with each

## distributing

other and/or a central computer.

- GS data processing
  - . **distributed processing**
  - . . grid computing (computer networks)
- RT architecture (computers)
  - client server systems
  - computer networks
  - computer systems design
  - Dining Philosophers Problem
  - distributed interactive simulation
  - distributed memory
  - microprocessors
  - service oriented architecture
  - transputers
  - VSAT (network)
  - wide area networks

### distributing

- UF *dispatching*
- RT allocations
  - assimilation
  - commercial energy
  - dispersing
  - disposal
- ∞ distribution
  - domestic energy
- ∞ food
  - industrial energy
  - inventory controls
  - materials handling
  - positioning
  - proportion
  - resource allocation
  - transportation
  - transportation energy

### ∞ distribution

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT allocations
  - assimilation
  - brightness distribution
  - circulation distribution
  - demography
  - dispersing
  - disposal
  - distributing
  - distribution (property)
  - geographic distribution
  - kurtosis
  - load distribution (forces)
  - mass distribution
  - materials handling
  - positioning
  - pressure distribution
  - spectral energy distribution
  - statistical distributions
  - thrust distribution
  - transportation

### distribution (property)

- UF *pattern distribution*
- GS **distribution (property)**
  - . angular distribution
  - . Boltzmann distribution
  - . brightness distribution
  - . charge distribution
  - . current distribution
  - . electron distribution
  - . . electron distribution profiles
  - . energy distribution
  - . . spectral energy distribution
  - . flow distribution
  - . force distribution
  - . frequency distribution
  - . . kurtosis
  - . hole distribution (electronics)
  - . hole distribution (mechanics)
  - . interference lift
  - . ion distribution
  - . load distribution (forces)
  - . mass distribution
  - . moment distribution
  - . neutron distribution
  - . pressure distribution
  - . radial distribution
  - . radiation distribution
  - . . antenna radiation patterns

- . . . sidelobes
- . . diffraction patterns
- . . . Kossel pattern
- . . . rainbows
- . spatial distribution
- . . horizontal distribution
- . . vertical distribution
- . . . star distribution
- . . geographic distribution
- . strain distribution
- . stress distribution
- . . stress concentration
- . temperature distribution
- . velocity distribution
- RT chemical composition
- ∞ cross sections
- ∞ distribution
  - dynamic characteristics
  - field theory (physics)
  - gradients
  - jet lift
  - lift
- ∞ patterns
- ∞ profiles
- rotor lift
- statistical distributions
- synthetic arrays
- zero lift

### distribution functions

DEF The density functions or number of particles per unit volume of phase space. The distribution functions are a function of the three space coordinates and the three velocity coordinates.

- GS functions (mathematics)
  - . **distribution functions**
  - . . probability distribution functions
- RT Chapman-Enskog theory
  - discrete functions
  - maximum entropy method
- ∞ nets
  - probability theory
  - statistical distributions

### distribution moments

- UF *statistical moments*
- GS moments
  - . **distribution moments**
  - . . mean
  - . . orthogonality
  - . . standard deviation
- RT average
  - median (statistics)
  - method of moments
  - mode (statistics)
  - skewness
  - statistical distributions
  - variance (statistics)

### distributors

- RT commutators
- dispensers
- feeders
- ignition systems
- internal combustion engines
- materials handling
- rollers
- sprayers

### District of Columbia

- GS nations
  - . United States
  - . . **District of Columbia**
- RT Potomac River Valley (MD-VA-WV)

### disturbance theory

USE **perturbation theory**

### ∞ disturbances

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT bursts
  - disorders
  - electromagnetic interference
  - ionospheric disturbances
  - ionospheric storms
  - magnetic disturbances
  - perturbation
  - radio auroras

- radio bursts
- solar activity
- storms
- sudden ionospheric disturbances
- vortices

### disturbing functions

- GS functions (mathematics)
  - . **disturbing functions**
- RT perturbation theory

### disulfides

- GS chalcogenides
  - . sulfides
  - . . **disulfides**
  - . . . carbon disulfide
- sulfur compounds
  - . sulfides
  - . . **disulfides**
  - . . . carbon disulfide

### ditches

- RT canals
- irrigation
- landforms
- troughs

### ∞ ditching

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ditching (landing)
  - excavation

### ditching (excavation)

USE **excavation**

### ditching (landing)

- GS crashes
  - . crash landing
  - . . **ditching (landing)**
  - landing
  - . **ditching (landing)**
- RT aircraft accidents
- ∞ ditching
  - glide landings
  - water landing

### dithers

- GS shaking
  - . **dithers**
  - shivering
  - . **dithers**
- RT disorders
  - disorientation
  - emotional factors
  - human behavior
- ∞ inhibition
  - irrationality
  - vacillation

### dithiols

USE **thiols**

### diuresis

- RT body fluids
- edema
- urination
- vasopressins

### diuretics

- GS **diuretics**
  - . aminophylline
- RT acetazolamide
- ureas

### diurnal rhythms

USE **circadian rhythms**

### diurnal variations

- GS variations
  - . periodic variations
  - . . **diurnal variations**
- RT cycles
- darkness
- daytime
- magnetic variations
- night
- nocturnal variations
- photoperiod
- tropopause

wind variations

### divergence

DEF The expansion or spreading out of a vector field; also a precise measure thereof. A static instability of a lifting surface or of a body on a vehicle wherein the aerodynamic loads tending to deform surface or body are greater than the elastic restoring forces.

GS **divergence**  
 . magnetic charge density  
 RT catastrophe theory  
 convergence  
 deviation  
 differences  
 displacement  
 ∞ drift  
 Fourier analysis  
 functions (mathematics)  
 geostrophic wind  
 refraction  
 series (mathematics)  
 series expansion  
 variations  
 vortices

### divergent nozzles

RT conical nozzles  
 exhaust nozzles  
 nozzle geometry  
 nozzle walls  
 ∞ nozzles  
 rocket nozzles  
 thrust chambers  
 wind tunnel nozzles

### diverters

GS **diverters**  
 . divertors (fusion reactors)  
 RT baffles  
 blast deflectors  
 bypasses  
 deflectors  
 ∞ diffusers  
 dividers  
 flame deflectors  
 ∞ separation  
 separators  
 shielding  
 valves

### divertors (fusion reactors)

(added March 1995)  
 GS diverters  
 . **divertors (fusion reactors)**  
 RT limiters (fusion reactors)  
 magnetic field configurations  
 plasma control  
 tokamak devices

### dividers

SN (EXCLUDES VOLTAGE AND FREQUENCY DIVIDERS)  
 GS separators  
 . **dividers**  
 RT baffles  
 ∞ barriers  
 curtains  
 diverters  
 panels  
 spacers

### divides (landforms)

GS landforms  
 . **divides (landforms)**  
 RT drainage patterns  
 mountains  
 watersheds

### dividing (mathematics)

GS number theory  
 . **dividing (mathematics)**  
 RT arithmetic  
 computation  
 congruences  
 ∞ division  
 quotients

### diving (underwater)

GS submerged bodies  
 . **diving (underwater)**

RT barotrauma  
 decompression sickness  
 human tolerances  
 medical phenomena  
 physiological effects  
 underwater physiology  
 underwater tests

### ∞ division

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT cell division  
 dividing (mathematics)  
 number theory  
 ∞ separation  
 subdivisions  
 subsidiaries

### DIVOT (voice translators)

USE **digital to voice translators**

### dizziness

(added August 2004)  
 DEF An imprecise term which may refer to a sense of spatial disorientation, motion of the environment, or lightheadedness.  
 GS signs and symptoms  
 . **dizziness**  
 RT acceleration stresses (physiology)  
 disorientation  
 motion sickness

### Djibouti

(added February 1989)  
 GS nations  
 . **Djibouti**  
 RT Africa

### DME-A satellite

USE **Explorer 31 satellite**

### DMSP satellites

DEF Satellites of the defense meteorological satellite program, a program sponsored by the United States Air Force System Command's Space Division which provides timely global imagery and specialized meteorological data for supporting a variety of Department of Defense operations. Used for Defense Meteorological Satellite Program.

UF *Defense Meteorological Satellite Program*

GS artificial satellites  
 . meteorological satellites  
 . . **DMSP satellites**  
 military spacecraft  
 . **DMSP satellites**

RT air defense  
 ∞ defense  
 defense program  
 meteorology  
 NPOESS  
 photomapping  
 photoreconnaissance  
 remote sensing  
 satellite-borne photography

### DNA

USE **deoxyribonucleic acid**

### DNS (numerical analysis)

(added October 1997)  
 USE **direct numerical simulation**

### DO-27 aircraft

UF *Domier DO-27 aircraft*  
 GS Dornier aircraft  
 . **DO-27 aircraft**  
 general aviation aircraft  
 . **DO-27 aircraft**  
 light aircraft  
 . **DO-27 aircraft**  
 monoplanes  
 . **DO-27 aircraft**  
 passenger aircraft  
 . **DO-27 aircraft**  
 RT ∞ aircraft

### DO-28 aircraft

UF *Domier DO-28 aircraft*

GS Dornier aircraft  
 . **DO-28 aircraft**  
 general aviation aircraft  
 . **DO-28 aircraft**  
 light aircraft  
 . **DO-28 aircraft**  
 monoplanes  
 . **DO-28 aircraft**  
 passenger aircraft  
 . **DO-28 aircraft**  
 RT ∞ aircraft

### DO-31 aircraft

UF *Dornier DO-31 aircraft*  
 GS Dornier aircraft  
 . **DO-31 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **DO-31 aircraft**  
 monoplanes  
 . **DO-31 aircraft**  
 transport aircraft  
 . **DO-31 aircraft**  
 V/STOL aircraft  
 . **DO-31 aircraft**  
 RT ∞ aircraft

### DO-328 aircraft

(added September 1994)  
 GS commercial aircraft  
 . **DO-328 aircraft**  
 Dornier aircraft  
 . **DO-328 aircraft**  
 jet aircraft  
 . turboprop aircraft  
 . . **DO-328 aircraft**  
 passenger aircraft  
 . **DO-328 aircraft**  
 transport aircraft  
 . **DO-328 aircraft**  
 RT ∞ aircraft

### docking

(added May 2005)  
 GS maneuvers  
 . **docking**  
 . . autonomous docking  
 . . offshore docking  
 . . spacecraft docking  
 RT interception  
 mooring  
 multiple docking adapters

### document indexing

(added April 2000)  
 USE **indexing (information science)**

### document markup languages

(added July 1995)  
 DEF Standardized nomenclatures that specify the organization of complex text (including technical and scientific notation, graphics, and images) and define the document type, data elements within the document, and the relationship between data elements for electronically prepared, stored, interchanged, and published documents.

UF *DSSSL*  
*HTML*  
*HYTIME*  
*markup languages*  
*SGML*  
*SPDL*

GS languages  
 . **document markup languages**  
 RT documentation  
 electronic publishing  
 human-computer interface  
 hypertext  
 information transfer  
 printing  
 standards

### document storage

RT data storage  
 documentation  
 ∞ files  
 reproduction (copying)

## documentation

∞ storage

### documentation

SN (LIMITED TO WRITTEN MATERIAL THAT ACCOMPANIES, EXPLAINS, SPECIFIES OR DESCRIBES EQUIPMENT OR SYSTEMS)  
DEF The assembling, coding, and disseminating of recorded knowledge.  
GS literature  
RT acquisition  
bibliographies  
biography  
case histories  
catalogs (publications)  
conferences  
data retrieval  
document markup languages  
document storage  
documents  
histories  
indexes (documentation)  
information  
information dissemination  
information resources management  
information retrieval  
knowledge  
lessons learned  
libraries  
news  
records  
∞ reference systems  
reports  
selective dissemination of information  
space glossaries  
summaries  
technical writing  
technology transfer  
translating

### documents

UF *publications*  
GS **documents**  
. abstracts  
. bibliographies  
. catalogs (publications)  
. . . astronomical catalogs  
. congressional reports  
. dictionaries  
. drawings  
. . . engineering drawings  
. . . blueprints  
. handbooks  
. . . user manuals (computer programs)  
. manuals  
. . . installation manuals  
. . . user manuals (computer programs)  
. papers  
. periodicals  
. postlaunch reports  
. Presidential reports  
. proposals  
. records  
. . . video disks  
. supplements  
. textbooks  
. texts  
. theses  
RT conferences  
copyrights  
documentation  
electronic publishing  
format  
hardware utilization lists  
indexes (documentation)  
information retrieval  
libraries  
literature  
reports  
technology transfer

### Dodge satellite

GS artificial satellites  
. **Dodge satellite**

### doghouses (electronics)

DEF Small enclosures placed at the base of transmitting antenna towers to house antenna tuning equipment.  
GS housings

### . doghouses (electronics)

radar equipment

### . doghouses (electronics)

RT enclosures  
radar antennas

### dogs

GS animals  
. vertebrates  
. . . mammals  
. . . **dogs**  
RT wolves

### dollies

GS surface vehicles  
. **dollies**  
RT carriages  
materials handling  
sleds  
trucks  
undercarriages

### dolomite (mineral)

DEF A common rock-forming rhombohedral material consisting of calcium, magnesium, and carbonates. It is used for refractory products.

GS carbon compounds  
. carbonates  
. . **dolomite (mineral)**  
magnesium compounds  
. **dolomite (mineral)**  
minerals  
. **dolomite (mineral)**  
RT aggregates  
limestone  
rocks  
sedimentary rocks

### dolphins

GS animals  
. vertebrates  
. . . mammals  
. . . marine mammals  
. . . . **dolphins**

### domain wall

RT domains  
ferroelasticity  
magnetic domains  
∞ motion

### domains

GS **domains**  
. magnetic domains  
RT dipole moments  
domain wall  
electrical properties  
range (extremes)

### ∞ domes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT domes (geology)  
domes (structural forms)

### domes (geology)

GS geology  
. **domes (geology)**  
RT anticlines  
∞ domes  
geosynclines  
synclines

### domes (structural forms)

GS shells (structural forms)  
. **domes (structural forms)**  
. . . radomes  
RT ∞ cupolas  
∞ domes  
hemispherical shells  
housings  
pressure vessels  
protuberances

### domestic energy

RT allocations  
commercial energy  
distributing  
economic factors  
∞ energy

energy consumption  
energy conversion  
industrial energy  
solar cooling  
solar houses  
transportation energy  
water heating

### domestic satellite communications systems

RT communication satellites  
direct broadcast satellites  
microwave transmission  
RCA Satcom satellites  
satellite networks  
satellite transmission  
∞ systems

### dominance

GS **dominance**  
. eye dominance  
RT genetics

### Dominica

GS landforms  
. islands  
. . West Indies  
. . . **Dominica**  
nations  
. **Dominica**

### Dominican Republic

GS nations  
. **Dominican Republic**  
RT Caribbean region  
Caribbean Sea

### Domino propellants

GS propellants  
. high energy propellants  
. . **Domino propellants**  
RT plasticizers  
rocket oxidizers  
solid rocket propellants

*Donatello Logistics Module (ISS)*  
(added April 2005)

USE **Multi-Purpose Logistics Modules**

### Donnell equations

RT buckling  
∞ equations  
stress analysis

### donor materials

GS semiconductors (materials)  
. **donor materials**  
RT antisite defects  
carrier density (solid state)  
doping (materials)  
electrons  
holes (electron deficiencies)  
∞ materials  
modulation doping

### doors

UF *exits (doors)*  
RT air locks  
apertures  
curtains  
egress  
entrances  
floors  
gates (openings)  
hatches  
ingress (spacecraft passageway)  
openings  
outlets  
∞ thresholds  
windows (apertures)

### dopa

DEF An intermediate organic compound produced by oxidation of tyrosine by tyramine; also, an intermediate product in the synthesis of both epinephrine and melanin. Used for dihydroxyphenylalanine.

UF *dihydroxyphenylalanine*  
GS acids  
. amino acids  
. . **dopa**

organic compounds  
 . amino acids  
 . . **dopa**  
 RT ∞ chemical compounds  
 dopamine  
 melanin  
 oxidation  
 pigments

**dopamine**  
 (added June 1997)  
 RT catecholamine  
 dopa  
 drugs  
 epinephrine  
 neurophysiology  
 neurotransmitters  
 norepinephrine

**doped crystals**  
 GS crystals  
 . **doped crystals**  
 RT crystal growth  
 crystal optics  
 crystal structure  
 doping (materials)  
 fullerides  
 gadolinium-gallium garnet  
 MODFETS  
 modulation doping  
 neutron transmutation doping

**dopes**  
 RT additives  
 fillers  
 finishes  
 gels  
 primers (coatings)  
 sealers

*doping (additives)*  
 USE **additives**

**doping (materials)**  
 (added June 2003)  
 DEF The incorporation of impurities into silicon or other semiconductor materials in order to modify the conductivity or other electrical properties of these materials  
 GS **doping (materials)**  
 . modulation doping  
 . neutron transmutation doping  
 RT additives  
 crystal lattices  
 donor materials  
 doped crystals  
 ion implantation  
 semiconductor devices  
 semiconductors (materials)

**Doppler effect**  
 DEF The change in frequency with which energy reaches a receiver when the receiver and the energy source are in motion relative to each other. Used for DOVAP and stellar Doppler shift.  
 UF *DOVAP*  
*stellar Doppler shift*  
 GS **Doppler effect**  
 . Doppler-Fizeau effect  
 RT blue shift  
 ∞ effects  
 elastic waves  
 electromagnetic radiation  
 Fizeau effect  
 frequency shift  
 optical heterodyning  
 radial velocity  
 red shift  
 satellite doppler positioning  
 stellar motions

**Doppler navigation**  
 DEF Dead reckoning performed automatically by a device which gives a continuous indication of position by integrating the speed derived from measurement of the Doppler effect of echoes from directed beams of radiant energy transmitted from the craft.  
 GS navigation

. **Doppler navigation**  
 RT air navigation  
 all-weather air navigation  
 dead reckoning  
 radar navigation  
 radio navigation  
 satellite doppler positioning

**Doppler radar**  
 DEF Radar which utilizes the Doppler effect to determine the radial component of velocities of relative radar targets or to select targets having particular radial velocities.  
 GS radar  
 . **Doppler radar**  
 . . multistatic radar  
 . . pulse Doppler radar  
 . . . monopulse radar  
 . . . Shuttle Imaging Radar  
 RT airborne radar  
 coherent radar  
 continuous wave radar  
 monopulse radar  
 moving target indicators  
 polystation doppler tracking system  
 pulse radar  
 radar detection  
 radar equipment  
 radar navigation  
 radar networks  
 radar tracking  
 satellite doppler positioning  
 sodar  
 surveillance radar

**Doppler-Fizeau effect**  
 DEF The Doppler effect applied to a source of light. When the distance between the observer and the source of light is diminishing, the lines of the spectrum are displaced towards the violet, and, when the distance is increasing, they are displaced toward the red, the displacement being proportional to the relative velocity of approach or recession.  
 GS Doppler effect  
 . **Doppler-Fizeau effect**  
 RT blue shift  
 ∞ effects  
 Fizeau effect  
 frequency shift  
 radar navigation  
 red shift  
 stellar motions

**Dornier aircraft**  
 GS **Dornier aircraft**  
 . DO-27 aircraft  
 . DO-28 aircraft  
 . DO-31 aircraft  
 . DO-328 aircraft  
 RT ∞ aircraft

*Dornier DO-27 aircraft*  
 USE **DO-27 aircraft**

*Dornier DO-28 aircraft*  
 USE **DO-28 aircraft**

*Dornier DO-31 aircraft*  
 USE **DO-31 aircraft**

**Dornier paraglider rocket vehicle**  
 GS rocket vehicles  
 . single stage rocket vehicles  
 . . **Dornier paraglider rocket vehicle**  
 . sounding rockets  
 . . **Dornier paraglider rocket vehicle**  
 RT liquid propellant rocket engines

**dorsal sections**  
 RT anatomy  
 posterior sections

**dosage**  
 UF *dose*  
 GS **dosage**  
 . radiation dosage  
 . sublethal dosage  
 RT biological effects  
 dosimeters

drugs  
 radiation measurement

*dose*  
 USE **dosage**

**dosimeters**  
 DEF Instruments for measuring the ultraviolet in solar and sky radiation. Devices worn by persons working around radioactive material, which indicate the dose of radiation to which they have been exposed. Used for dosimetry.  
 UF *dosimetry*  
 GS measuring instruments  
 . radiation measuring instruments  
 . . radiation detectors  
 . . . **dosimeters**  
 . . . threshold detectors (dosimeters)  
 RT actinometers  
 dosage  
 exposure  
 flux (rate)  
 flux density  
 Geiger counters  
 ionization chambers  
 irradiation  
 neutron counters  
 nuclear emulsions  
 photographic measurement  
 proportional counters  
 radiant flux density  
 radiation counters  
 radiation dosage  
 radiation effects  
 radiation hazards  
 radiation measurement  
 radiobiology

*dosimetry*  
 USE **dosimeters**

**double base propellants**  
 DEF Solid rocket propellants using two unstable compounds, such as nitrocellulose and nitroglycerin. The unstable compounds used in a double based propellant do not require a separate oxidizer. Used for cordite.  
 UF *cordite*  
 GS propellants  
 . **double base propellants**  
 . . double base rocket propellants  
 RT cellulose nitrate  
 composite propellants  
 endothermic fuels  
 explosives  
 nitroglycerin  
 plastisols  
 pyrotechnics

**double base rocket propellants**  
 GS gels  
 . **double base rocket propellants**  
 propellants  
 . double base propellants  
 . . **double base rocket propellants**  
 . rocket propellants  
 . . solid rocket propellants  
 . . . **double base rocket propellants**  
 . solid propellants  
 . . solid rocket propellants  
 . . . **double base rocket propellants**  
 RT cellulose nitrate  
 composite propellants  
 explosives  
 nitroglycerin

**double cusps**  
 UF *osculations*  
 GS geometry  
 . cusps (mathematics)  
 . . **double cusps**  
 RT ∞ cusps

**double precision arithmetic**  
 GS number theory  
 . arithmetic  
 . . **double precision arithmetic**  
 RT arithmetic and logic units



## double sideband transmission

∞ numbers

### double sideband transmission

- GS transmission
  - . electromagnetic wave transmission
  - . . radio transmission
  - . . . **double sideband transmission**
  - . signal transmission
  - . . radio transmission
  - . . . **double sideband transmission**
- RT modulation
  - sidebands
  - single sideband transmission
  - television transmission
  - wave propagation

### double stars

DEF Stars which appear as single points of light to the eye but which can be resolved into two points by a telescope. A double star is not necessarily a binary, a two star system revolving about a common center, but may be an optical double, two unconnected stars in the same line of sight.

- GS celestial bodies
  - . stars
  - . . **double stars**
  - . . . binary stars
  - . . . . cataclysmic variables
  - . . . . companion stars
  - . . . . . Nemesis (star)
  - . . . . eclipsing binary stars
  - . . . . . dwarf novae
  - . . . . . Lambda Tauri stars
  - . . . . . Zeta Aurigae star
  - . . . . . Sigma Orionis
  - . . . . . symbiotic stars
  - . . . . . x ray binaries
- RT astrometry
  - stellar motions

*double-layer capacitors*

(added September 2003)

USE **electrochemical capacitors**

*doughnut shape wheels*

USE **toroidal wheels**

### Douglas aircraft

- GS McDonnell Douglas aircraft
  - . **Douglas aircraft**
  - . . A-1 aircraft
  - . . A-3 aircraft
  - . . A-4 aircraft
  - . . B-66 aircraft
  - . . C-9 aircraft
  - . . C-47 aircraft
  - . . C-54 aircraft
  - . . C-118 aircraft
  - . . C-124 aircraft
  - . . C-133 aircraft
  - . . D-558 aircraft
  - . . DC 3 aircraft
  - . . DC 7 aircraft
  - . . DC 8 aircraft
  - . . DC 9 aircraft
  - . . DC 10 aircraft
  - . . PD-808 aircraft
  - . . X-3 aircraft
- RT ∞ aircraft

*Douglas D-558 aircraft*

USE **D-558 aircraft**

*Douglas DC-3 aircraft*

USE **DC 3 aircraft**

*Douglas DC-7 aircraft*

USE **DC 7 aircraft**

*Douglas DC-8 aircraft*

USE **DC 8 aircraft**

*Douglas DC-9 aircraft*

USE **DC 9 aircraft**

*Douglas PD-808 aircraft*

USE **PD-808 aircraft**

*DOVAP*

USE **Doppler effect**

### downbursts

(added March 1991)

- GS storms
  - . storms (meteorology)
  - . . **downbursts**
  - . . . microbursts (meteorology)
- RT aviation meteorology
  - flight hazards
  - thunderstorms
  - vertical air currents
  - wind shear

### down-converters

- GS frequency converters
  - . **down-converters**
- RT ∞ converters
  - frequency dividers

### downlinking

DEF The transmission of signals (data, information, etc.) from satellites to ground terminals.

- RT carrier to noise ratios
  - communication satellites
  - frequency reuse
  - ground stations
  - microwave transmission
  - satellite transmission
  - transmission efficiency
  - uplinking

### downrange

DEF The airspace extending downstream on a given rocket test range.

- RT ballistic ranges
  - ballistic trajectories
  - flight tests
  - impact prediction
  - missile ranges
  - recovery zones
  - test ranges
  - touchdown
  - trajectories

### Downrange Antimissile Measurement Program

- UF *DAMP program*
- GS programs
  - . **Downrange Antimissile Measurement Program**
- RT ∞ measurement

### downrange measurement

- RT ∞ measurement
  - test ranges

### downtime

DEF A period during which equipment is not operating correctly because of machine failure.

- GS time
  - . **downtime**
- RT failure
  - inventory management
  - logistics
  - maintenance
  - malfunctions
  - MTBF
  - reliability
  - spare parts
  - system failures
  - turnaround (STS)

### downwash

- RT backwash
  - ∞ draft
    - ground effect (aerodynamics)
    - helicopter wakes
    - lift augmentation
    - peripheral jet flow
    - upwash
    - wakes

*DPCM (modulation)*

USE **differential pulse code modulation**

### Draconid meteoroids

- GS celestial bodies
  - . meteoroid showers
  - . . **Draconid meteoroids**
  - . meteoroids
  - . . **Draconid meteoroids**

RT Giacobini-Zinner comet

### ∞ draft

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT boundary layers
  - downwash
  - draft (gas flow)
  - drafting (drawing)
  - upwash
  - wakes

### draft (gas flow)

- RT ∞ draft
  - flues
  - ventilation

### drafting (drawing)

- RT ∞ draft
  - ∞ drawing
  - drawings
  - graphic arts

### drafting machines

- RT computer aided design
  - ∞ design
  - ∞ machinery

### drag

DEF A retarding force acting upon the direction of motion of the body. It is a component of the total fluid forces acting on the body. Used for drag effect.

- UF *drag effect*
- GS dynamic characteristics
  - . **drag**
  - . . electrostatic drag
  - . . friction drag
  - . . . aerodynamic drag
  - . . . . supersonic drag
  - . . . . viscous drag
  - . . . . . induced drag
  - . . . . . minimum drag
  - . . . . . pressure drag
  - . . . . . supersonic drag
  - . . . . . wave drag
  - . . . . . interference drag
  - . . . . . satellite drag
- RT aerodynamic configurations
  - aerodynamics
  - boundary layers
  - ∞ drag coefficients
  - drag measurement
  - friction
  - gravitation
  - ground effect (aerodynamics)
  - lift
  - skin friction
  - wakes

*drag balance*

USE **aerodynamic balance**  
**lift drag ratio**

### drag chutes

- UF *drogue parachutes*
- GS brakes (for arresting motion)
  - . aerodynamic brakes
  - . . **drag chutes**
  - drag devices
  - . aerodynamic brakes
  - . . **drag chutes**
  - parachutes
  - . **drag chutes**
- RT aircraft brakes
  - airdrops
  - ballutes
  - ribbon parachutes
  - towed bodies

### ∞ drag coefficients

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The ratios of drag to the products of dynamic pressures and reference areas.
- RT aerodynamic coefficients
  - aerodynamic drag
  - drag

- hydrodynamic coefficients
- drag devices**  
 UF *dragulators*  
 GS **drag devices**  
 . aerodynamic brakes  
 . . ballutes  
 . . drag chutes  
 . . split flaps  
 . . wing flaps  
 . . . leading edge flaps  
 . . . leading edge slats  
 . . . trailing edge flaps  
 . . . vortex flaps  
 . spoilers  
 RT abort apparatus  
 aircraft brakes  
 boundary layer control  
 brakes (for arresting motion)  
 control surfaces  
 flaps (control surfaces)  
 lift devices  
 skin friction  
 vortex alleviation
- drag effect*  
 USE **drag**
- drag force anemometers**  
 DEF Instruments for measuring both the static and dynamic velocity head and flow in high frequency, unsteady flow.  
 GS measuring instruments  
 . anemometers  
 . . **drag force anemometers**  
 RT flow measurement  
 ∞ instruments  
 velocity measurement
- drag measurement**  
 GS mechanical measurement  
 . **drag measurement**  
 RT aerodynamic drag  
 drag  
 electrostatic drag  
 flow measurement  
 ∞ measurement  
 measuring instruments
- drag reduction**  
 RT aerodynamic drag  
 fluid flow  
 friction  
 induced drag  
 lift drag ratio  
 ∞ reduction  
 riblets  
 winglets
- dragulators*  
 USE **brakes (for arresting motion)**  
**drag devices**
- drainage**  
 UF *draining*  
*runoffs*  
 RT ∞ discharge  
 evacuating (vacuum)  
 excavation  
 flood control  
 hydrology  
 hydrology models  
 irrigation  
 liquid wastes  
 mines (excavations)  
 permeability  
 ∞ pumping  
 seepage  
 sewers  
 sumps  
 tunneling (excavation)  
 waste disposal  
 water flow  
 water runoff  
 water tables
- drainage patterns**  
 UF *dendritic drainage*  
*interlacing drainage*  
*radial drainage patterns*
- rectangular drainage*  
 RT arroyos  
 divides (landforms)  
 flood damage  
 hydrology  
 irrigation  
 Mississippi River (US)  
 ∞ patterns  
 precipitation (meteorology)  
 tributaries  
 water erosion  
 water flow  
 watersheds
- draining*  
 USE **drainage**
- ∞ **drawing**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT bundle drawing  
 cold drawing  
 drafting (drawing)  
 drawings  
 extruding  
 layouts  
 metal drawing  
 pulling  
 records  
 stretch forming  
 stretching  
 tempering
- drawings**  
 UF *elevations (drawings)*  
 GS documents  
 . **drawings**  
 . . engineering drawings  
 . . . blueprints  
 RT charts  
 ∞ cross sections  
 diagrams  
 dimensions  
 drafting (drawing)  
 ∞ drawing  
 graphic arts  
 inks  
 layouts  
 ∞ plans  
 ∞ projection  
 representations  
 reproduction (copying)  
 specifications  
 ∞ tracing  
 visual aids
- DRC (capsule)*  
 USE **Discoverer recovery capsules**
- dreams**  
 RT rapid eye movement state  
 sleep
- dredged materials**  
 DEF Sand, mud, silt, gravel, etc., recovered from the bottoms of harbors, canals, etc., during dredging operations.  
 RT channel flow  
 ∞ channels  
 ∞ materials  
 sediments
- dredging**  
 DEF Mechanical or hydraulic excavation of underwater material. Used in maintaining and building of channels and ports as well as underwater mining of sand, gravel, and minerals.  
 RT artificial harbors  
 harbors  
 mineral deposits  
 mining  
 underwater resources
- ∞ **drift**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT deviation  
 divergence  
 drift (instrumentation)
- drift rate  
 flight paths  
 ionospheric drift  
 stability
- drift (instrumentation)**  
 UF *instrument drift*  
 RT accuracy  
 circuit reliability  
 ∞ drift  
 drift rate  
 dynamic stability  
 errors  
 instrument errors  
 static stability  
 tolerances (mechanics)
- drift rate**  
 DEF The amount of drift, in any of its several senses, per unit time. Drift rate has many specific meanings in different fields. The type of drift rate should always be specified.  
 GS rates (per time)  
 . **drift rate**  
 RT ∞ drift  
 drift (instrumentation)  
 ionospheric drift  
 mobility  
 orbit perturbation  
 orbital mechanics  
 rotating plasmas  
 stability  
 trajectory control
- drill bits**  
 GS cutters  
 . **drill bits**  
 tools  
 . **drill bits**  
 RT bits  
 drilling  
 drills
- drilling**  
 GS **drilling**  
 . laser drilling  
 RT boreholes  
 core sampling  
 cutting  
 drill bits  
 drills  
 exploration  
 machining  
 micromachining  
 natural gas exploration  
 offshore energy sources  
 oil exploration  
 oil fields  
 penetration  
 perforating  
 piercing  
 tunneling (excavation)  
 wells
- drills**  
 GS cutters  
 . **drills**  
 tools  
 . **drills**  
 RT boring machines  
 compressed air  
 drill bits  
 drilling  
 machine tools  
 taps
- drinking**  
 GS ingestion (biology)  
 . **drinking**  
 RT beverages  
 swallowing
- ∞ **drives**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT mechanical drives  
 motivation  
 propulsion  
 sex  
 sleep

**drone aircraft**

wind tunnel drives

*drogue parachutes*  
USE **drag chutes**

*drogues*  
USE **towed bodies**

**drone aircraft**

DEF Remotely controlled aircraft. Used for drone helicopters.

UF *drone helicopters*  
GS drone vehicles

. **drone aircraft**

- . . target drone aircraft
- . . . Firebee 2 target drone aircraft
- . . . Jindivik target aircraft pilotless aircraft
- . **drone aircraft**
- . . target drone aircraft
- . . . Firebee 2 target drone aircraft
- . . . Jindivik target aircraft

RT ∞ aircraft  
antisubmarine warfare aircraft  
DAST program  
light aircraft  
∞ military aircraft  
oblique wings  
remotely piloted vehicles  
research aircraft  
V/STOL aircraft

*drone helicopters*  
USE **drone aircraft helicopters**

**drone vehicles**

GS **drone vehicles**  
. drone aircraft  
. . target drone aircraft  
. . . Firebee 2 target drone aircraft  
. . . Jindivik target aircraft  
RT ∞ military aircraft  
pilotless aircraft  
Sandpiper target missile  
∞ vehicles  
∞ winged vehicles

*Drones for Aerodynamic and Struct Test*  
USE **DAST program**

**drooped airfoils**

DEF A baseline airfoil with an abrupt change in cross-section at about midspan from the fuselage. The outboard portion of the wing has a cross-section with a nearly flat bottom and a drooped (downward) leading edge in relation to the inboard baseline wing.

GS aerodynamic configurations

. **drooped airfoils**

aircraft configurations

. **drooped airfoils**

airfoils

. **drooped airfoils**

RT body-wing configurations  
wing roots  
wings

∞ **drop**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT drops (liquids)  
gradients

**drop calorimeters**

GS measuring instruments  
. calorimeters  
. . **drop calorimeters**  
RT bomb calorimeters  
flame calorimeters  
heat measurement  
high temperature tests  
temperature measuring instruments

**drop size**

DEF The diameter of a drop if it is approximately spherical; otherwise, the approximate shape and appropriate dimensions must be described.

RT cloud physics

clouds (meteorology)  
condensates  
condensing  
fog  
humidity  
hydrogen clouds  
nucleation  
particle diffusion  
particle size distribution  
∞ precipitation  
precipitation particle measurement  
raindrops  
size distribution

**drop tests**

UF *drop weight tests*  
RT Charpy impact test  
destructive tests  
impact testing machines  
impact tests  
notch tests  
shock tests  
∞ tests

**drop towers**

DEF Large devices for low gravity processing of molten material which consist of either a capsule which is dropped, or a drop tube where containerless low gravity studies are conducted or both. Used for drop tubes.

UF *drop tubes*  
RT falling spheres  
gravitational effects  
low gravity manufacturing  
microgravity  
weightlessness

**drop transfer**

GS transferring  
. **drop transfer**  
RT arc melting  
melting  
plasma jets  
refining

*drop tubes*

USE **drop towers**

*drop weight tests*

USE **drop tests**

**dropouts**

DEF Discrete variations in signal levels during the reproduction of recorded data which result in data reduction errors.

RT circuit breakers  
electric contacts  
electric switches  
switches

**drops (liquids)**

DEF Small bodies of liquid held together primarily by surface tension. Used for liquid drops.

UF *liquid drops*  
GS particles  
. **drops (liquids)**

. . raindrops  
RT air pollution  
Bond number  
condensation nuclei  
condensing

∞ drop  
hydrometers  
sprayers  
thermocapillary migration

**dropsondes**

DEF Radiosondes equipped with a parachute, dropped from an aircraft to transmit measurements of atmospheric conditions as it descends.

GS measuring instruments  
. meteorological instruments  
. . **dropsondes**  
. sondes  
. . **dropsondes**  
RT meteorological balloons  
radiosondes

rawinsondes

**Drosophila**

GS animals  
. invertebrates  
. . arthropods  
. . . insects  
. . . . **Drosophila**

RT chironomus flies

**drought**

UF *drought conditions*  
RT arid lands  
conservation  
desertification  
floods  
hydrology  
potable water  
precipitation (meteorology)  
water consumption  
water management  
water pollution  
water reclamation

*drought conditions*

USE **drought**

*drowsiness*

USE **sleep**

*drug therapy*

USE **chemotherapy**

**drugs**

UF *chemotherapeutic agents*  
GS **drugs**  
. adrenergics  
. aminophylline  
. anesthetics  
. . chloroform  
. . cyclopropane  
. . methyl chloride  
. . novocain  
. antiadrenergics  
. antibiotics  
. . actinomycin  
. . penicillin  
. . pleurotin  
. . streptomycin  
. . tetracyclines  
. anticonvulsants  
. antidiuretics  
. antidotes  
. antiemetics and antinauseants  
. antihistaminics  
. . dimenhydrinate  
. . diphenyl hydantoin  
. . promethazine  
. antihypertensive agents  
. antiinfectives and antibacterials  
. antiradiation drugs  
. . cysteamine  
. central nervous system depressants  
. cholinergics  
. . anticholinergics  
. cortisone  
. cysteine  
. decongestants  
. digitalis  
. epinephrine  
. ergotamine  
. hemostatics  
. histamines  
. insulin  
. methamphetamine  
. motion sickness drugs  
. muscle relaxants  
. narcotics  
. . morphine  
. Nembutal (trademark)  
. pentobarbital sodium  
. reserpine  
. psychotropic drugs  
. . marijuana  
. sedatives  
. stimulants  
. . atropine  
. . caffeine  
. . central nervous system stimulants  
. . norepinephrine

. tranquilizers  
 . trimethadione  
 . vasoconstrictor drugs  
 . . hypertensin  
 . . serotonin  
 . vasodilator agents

RT alkaloids  
 analgesia  
 anesthesiology  
 bioflavonoids  
 biotin  
 chemical defense  
 chemotherapy  
 cures  
 dopamine  
 dosage  
 ethers  
 ∞ medicine  
 pentobarbital  
 pharmacology  
 phenobarbital  
 psychopharmacology  
 quinoline  
 salicylates  
 sublethal dosage  
 thiophenes  
 vaccines  
 vitamins

*drumlins*  
 USE **glacial drift**

∞ **drums**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT ∞ barrels  
 ∞ cylinders  
 drums (containers)  
 magnetic drums  
 magnetic storage

**drums (containers)**  
 SN (EXCLUDE MAGNETIC COMPUTER MEMORIES)  
 RT barrels (containers)  
 ∞ buckets  
 cans  
 ∞ containers  
 ∞ cylinders  
 ∞ drums  
 tanks (containers)

**dry cells**  
 GS electric generators  
 . direct power generators  
 . . primary batteries  
 . . . **dry cells**  
 . . . . magnesium cells  
 . . . . nickel zinc batteries  
 electrochemical cells  
 . electric batteries  
 . . primary batteries  
 . . . **dry cells**  
 . . . . magnesium cells  
 . . . . nickel zinc batteries

RT metal air batteries  
 nickel cadmium batteries  
 storage batteries  
 thermal batteries

**dry friction**  
 GS friction  
 . **dry friction**

RT abrasion  
 kinetic friction  
 sliding friction  
 static friction

**dry heat**  
 GS heat  
 . **dry heat**

RT geothermal resources  
 geothermal technology  
 high temperature environments  
 humidity  
 ovens

**drydocks**  
 RT ∞ ports

sea launching

*dryers (equipment)*  
 USE **drying apparatus**

**drying**  
 UF *desiccation*  
*dewetting*  
 GS **drying**  
 . dehumidification  
 . dehydration  
 . freeze drying

RT ∞ absorption  
 baking  
 concentrating  
 curing  
 desaturation  
 dewatering  
 diffusion  
 enthalpy  
 evaporation  
 firing (igniting)  
 roasting  
 ∞ separation  
 silica gel  
 water loss

**drying apparatus**  
 UF *dryers (equipment)*  
 GS separators  
 . **drying apparatus**  
 . . desiccators  
 RT absorbers (equipment)  
 columns (process engineering)  
 condensers (liquefiers)  
 dehydrated food  
 evaporators  
 furnaces

*DS1 (space mission)*  
 (added October 1998)  
 USE **Deep Space 1 Mission**

*DSIF (instrumentation facility)*  
 USE **Deep Space Instrumentation Facility**

*DSN (space network)*  
 USE **Deep Space Network**

*DSN helicopter*  
 USE **QH-50 helicopter**

*DSSSL*  
 USE **document markup languages**

*DTA (analysis)*  
 USE **thermal analysis**

**DTL integrated circuits**  
 UF *Diode-Transistor-Logic integ circuits*  
 GS circuits  
 . integrated circuits  
 . . **DTL integrated circuits**

RT electronic packaging  
 large scale integration  
 microminiaturization  
 molecular electronics  
 transistor circuits

*DTMB-111 ground effect machine*  
 USE **ground effect machines**

*DTMB-430 ground effect machine*  
 USE **ground effect machines**

**Dual Air Density Explorer**  
 UF *DAD Explorer*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Dual Air Density Explorer**

*dual frequency radar*  
 USE **multispectral radar**

*dual mode propulsion*  
 USE **hybrid propulsion**

**dual spin spacecraft**  
 RT OSO-7

∞ spacecraft  
 spacecraft stability  
 spin stabilization

**dual thrust nozzles**  
 GS rocket nozzles  
 . **dual thrust nozzles**

RT ∞ nozzles  
 thrust

**dual wing configurations**  
 DEF A configuration of two wings of nearly the same planform and area, one behind the other.  
 RT biplanes  
 joined wings  
 tandem wing aircraft  
 wings

**duality principle**  
 DEF Principle that for any theorem in electric circuit analysis there is a dual theorem in which quantities are replaced with dual quantities. Examples are current and voltage or impedance and admittance.  
 RT ∞ analyzing  
 circuits  
 equivalent circuits  
 network analysis  
 ∞ paths  
 ∞ principles  
 signal flow graphs

**duality theorem**  
 DEF Theorem which states that if either of two dual linear programming problems has a solution, then so does the other.  
 GS theorems  
 . **duality theorem**

RT homology  
 isomorphism  
 ∞ mathematics  
 ∞ relationships

**dubnium**  
 (added May 1998)  
 GS chemical elements  
 . **dubnium**

RT rutherfordium  
 seaborgium

**duct geometry**  
 DEF The shape and dimensions of ports or other openings designed for passage of fluids (gases, liquids, or mixtures) in or external to engines.  
 GS geometry  
 . **duct geometry**

RT air flow  
 annular ducts  
 circular tubes  
 dump combustors  
 fluid flow  
 intake systems  
 openings  
 spatial marching

**ducted bodies**  
 RT annular ducts  
 axisymmetric bodies  
 bluff bodies  
 blunt bodies  
 ∞ bodies  
 ducts  
 intake systems  
 nacelles  
 nose inlets  
 shrouds  
 slender bodies  
 two dimensional bodies

**ducted fan engines**  
 DEF Aircraft engines incorporating a fan or propeller enclosed in a duct; especially jet engines in which an enclosed fan or propeller is used to ingest ambient air to augment the gases of combustion in the jetstream.  
 GS engines  
 . air breathing engines  
 . . gas turbine engines

## ducted fans

- . . . jet engines
- . . . . turbojet engines
- . . . . . **ducted fan engines**
- . internal combustion engines
- . . . gas turbine engines
- . . . . jet engines
- . . . . . turbojet engines
- . . . . . **ducted fan engines**
- . turbine engines
- . . gas turbine engines
- . . . jet engines
- . . . . turbojet engines
- . . . . . **ducted fan engines**
- RT turbofan engines

**ducted fans**

DEF Fans enclosed in ducts.

RT blowers  
fan blades

∞ fans

- lift fans
- propeller fans
- ring wings
- shrouded propellers
- turbofans
- ventilation fans

**ducted flow**

GS fluid flow

- . internal flow
- . . **ducted flow**
- . . . Knudsen flow

RT air flow  
cavity flow  
channel flow  
choked flow  
corner flow  
dump combustors  
flow geometry  
flow noise  
fuel flow  
heat transmission  
wall flow

*ducted propellers*

USE **shrouded propellers**

**ducted rocket engines**

GS engines

- . rocket engines
- . . **ducted rocket engines**

RT booster rocket engines

∞ hybrid rocket engines

- internal combustion engines
- liquid propellant rocket engines
- restartable rocket engines
- solid propellant rocket engines
- sustainer rocket engines

**ductile-brittle transition**

(added February 1994)

SN ((INCLUDES BOTH DUCTILE-TO-BRITTLE AND BRITTLE-TO-DUCTILE TRANSITIONS))

UF *brittle-ductile transition*

RT brittleness  
ductility  
fracture strength  
plastic deformation

∞ transition

- transition temperature
- yield strength

**ductility**

GS mechanical properties

- . **ductility**

RT brittleness  
compressive strength  
creep properties  
ductile-brittle transition  
elongation  
fatigue (materials)  
flattening  
fractography  
fracture strength  
hardness  
impact strength  
malleability  
metal drawing  
notch strength  
plastic properties

- shear properties
- softness
- stress relaxation
- stretching
- temper (metallurgy)
- tensile strength
- toughness
- Tresca flow
- weldability

## ducts

DEF Specifically, tubes or passages that confine and conduct fluids, as passages for the flow of air to compressors of gas turbine engines, or pipes leading air to superchargers.

### GS ducts

- . acoustic ducts
- . air ducts
- . annular ducts

RT baffles  
cavities

∞ channels

- ducted bodies
- exhaust systems
- flues
- intake systems
- nose inlets
- openings
- orifices
- outlets
- pipes (tubes)
- plenum chambers
- ports (openings)
- scoops
- throats

∞ tubes

- ventilation
- vents
- windows (apertures)

## Duffing differential equation

### GS algebra

- . nonlinear equations
- . . **Duffing differential equation**
- analysis (mathematics)
- . real variables
- . . differential equations
- . . . **Duffing differential equation**
- . . nonlinear equations
- . . . **Duffing differential equation**

RT ∞ equations  
probability theory

## dullness

USE **luster**

## dummies

RT decoys  
models  
simulators

## dummy loads

USE **impedance loading**  
**loading**  
**output**

## dump combustors

DEF Combustors having a means of reducing flow velocity and forming recirculation zones through the sudden enlargement area between the inlet duct and the combustion chamber.

### GS combustion chambers

- . **dump combustors**

RT combustible flow  
combustion efficiency  
duct geometry  
ducted flow  
engine parts  
flame holders  
flow velocity  
inlet flow  
ramjet engines  
rocket engines

## dumping

RT disconnect devices  
disposal  
ejection  
emptying  
expulsion

- jettisoning
- materials handling
- oil slicks
- releasing
- spilling
- spreading
- unloading

## Dunaliella

GS plants (botany)

- . algae
- . . **Dunaliella**

## dunes

DEF Low mounds, ridges, banks, or hills of loose, windblown granular material, usually sand, capable of movement. Used for barchans, coastal dunes, and sand dunes.

UF *barchans*  
*coastal dunes*  
*sand dunes*

### GS landforms

- . **dunes**

RT beaches  
coasts  
deserts  
lagoons  
Sahara Desert (Africa)  
sands  
topography  
wind effects

## *Dungeys wind shear mechanism*

USE **wind shear**

## dunite

GS rocks

- . igneous rocks
- . . **dunite**

RT minerals  
olivine  
peridotite  
soils

## duochromators

RT electromagnetic radiation

∞ generators

- light sources
- measuring instruments
- monochromators
- radiation sources
- spectrophotometers

## duoplasmatrons

GS ion sources

- . plasmatrons
- . . **duoplasmatrons**
- plasma generators
- . plasmatrons
- . . **duoplasmatrons**

RT electric discharges  
ion propulsion  
plasma propulsion  
plasmas (physics)  
sputtering

## duplex operation

DEF The operation of associated transmitting and receiving apparatus in which the processes of transmission and reception are concurrent.

RT ∞ metallurgy  
phase shift circuits  
switching circuits

## duplexers

DEF Devices which permit a single antenna system to be used for both transmitting and receiving. Duplexers should not be confused with diplexers, devices permitting an antenna system to be used simultaneously or separately by two transmitters.

RT circuits  
circulators (phase shift circuits)  
magic tees  
monopulse radar  
receivers  
switching circuits

- transmitters
- duplicating*  
USE **reproduction (copying)**
- durability**  
RT aircraft survivability  
corrosion  
cumulative damage  
damage  
degradation  
deterioration  
∞ endurance  
life (durability)  
long term effects  
mechanical properties  
∞ physical properties  
quality  
reliability  
∞ resistance  
ruggedness  
stability  
vulnerability  
wear
- duration*  
USE **time**
- durene**  
GS organic compounds  
. cyclic compounds  
. cyclic hydrocarbons  
. . . **durene**  
. hydrocarbons  
. cyclic hydrocarbons  
. . . **durene**
- dust**  
DEF An imprecise term referring to particulates capable of temporary suspension in air or other gases - also particles smaller than an arbitrary selected size.  
GS particles  
. **dust**  
. . . cosmic dust  
. . . interplanetary dust  
. . . . meteoroid dust clouds  
. . . . zodiacal dust  
. . . lunar dust  
. . . terrestrial dust belt  
RT aerosols  
air pollution  
Aitken nuclei  
cleaning  
∞ clouds  
combustion products  
contaminants  
dirt  
∞ dispersion  
dispersions  
dusty plasmas  
fumes  
particulates  
pollen  
powder (particles)  
R Coronae Borealis stars  
sands  
smoke  
space debris
- dust collectors**  
GS accumulators  
. **dust collectors**  
separators  
. **dust collectors**  
RT air filters  
electrostatic precipitators  
exhaust systems  
precipitators
- dust storms**  
GS storms  
. storms (meteorology)  
. . . **dust storms**  
RT atmospheric electricity  
atmospheric physics  
Mars (planet)  
Mars environment  
Mars surface
- wind effects
- dusty plasmas**  
(added May 2001)  
DEF Ionized gases containing small particles of solid matter, which are charged and interact through a Coulomb repulsion. They behave much like a colloidal suspension, exhibiting for example crystalline, liquid, and gas phases, and a melting/freezing phase transition.  
GS particles  
. charged particles  
. . . energetic particles  
. . . . plasmas (physics)  
. . . . . **dusty plasmas**  
. corpuscular radiation  
. . . energetic particles  
. . . . plasmas (physics)  
. . . . . **dusty plasmas**  
RT dust  
planetary rings  
plasma clouds  
plasma composition  
plasma-particle interactions  
space plasmas  
strongly coupled plasmas
- dwarf galaxies**  
DEF Galaxies with low luminosity.  
GS celestial bodies  
. galaxies  
. . . **dwarf galaxies**  
RT local group (astronomy)
- dwarf novae**  
DEF Short period binary systems in which a red quasi-main sequence star fills its Roche lobe and transfers matter, via an accretion disk, onto a white dwarf.  
GS celestial bodies  
. stars  
. . . double stars  
. . . . binary stars  
. . . . . eclipsing binary stars  
. . . . . **dwarf novae**  
. . . main sequence stars  
. . . . dwarf stars  
. . . . . **dwarf novae**  
. . . variable stars  
. . . . novae  
. . . . . **dwarf novae**  
RT Hercules nova  
stellar mass accretion  
stellar mass ejection  
superhumps (astronomy)  
white dwarf stars
- dwarf planets**  
(added September 2006)  
DEF Celestial bodies that are in orbit around the Sun, have sufficient mass for their self-gravity to overcome rigid body forces so that they assume a hydrostatic equilibrium (nearly round) shape, have not cleared the neighborhood around their orbits, and are not satellites of a planet.  
GS celestial bodies  
. **dwarf planets**  
. . . Ceres asteroid  
. . . Pluto (planet)  
RT asteroids  
Kuiper belt
- dwarf stars**  
GS celestial bodies  
. stars  
. . . main sequence stars  
. . . . **dwarf stars**  
. . . . . dwarf novae  
. . . . . flare stars  
. . . . . red dwarf stars  
RT brown dwarf stars  
cataclysmic variables  
F stars  
G stars  
K stars  
late stars  
Nemesis (star)  
subdwarf stars  
subgiant stars
- white dwarf stars
- dwell**  
RT delay  
ignition systems  
timing devices
- dyadics**  
GS algebra  
. polynomials  
. . . **dyadics**  
RT vectors (mathematics)
- dye lasers**  
GS stimulated emission devices  
. lasers  
. . . organic lasers  
. . . . **dye lasers**  
RT dyes  
infrared lasers  
laser outputs  
liquid lasers  
optical communication  
rhodamine  
tuning  
two-wavelength lasers
- dyes**  
GS **dyes**  
. methylene blue  
. rhodamine  
. thiazine (trademark)  
RT acriflavine  
aniline  
anthraquinones  
azines  
azo compounds  
chromophores  
dye lasers  
∞ markers  
methylene  
phenanthrene  
stilbene
- dynamic characteristics**  
UF *dynamic properties*  
GS **dynamic characteristics**  
. drag  
. . . electrostatic drag  
. . . friction drag  
. . . . aerodynamic drag  
. . . . . supersonic drag  
. . . . . viscous drag  
. . . induced drag  
. . . minimum drag  
. . . pressure drag  
. . . . supersonic drag  
. . . . . wave drag  
. . . . . interference drag  
. . . . . satellite drag  
. . . dynamic pressure  
. . . dynamic stability  
. . . combustion stability  
. . . flame stability  
. . . control stability  
. . . frequency stability  
. . . motion stability  
. . . . aerodynamic stability  
. . . . . aircraft stability  
. . . . . hovering stability  
. . . . . attitude stability  
. . . . . directional stability  
. . . . . . gyroscopic stability  
. . . . . . lateral stability  
. . . . . . longitudinal stability  
. . . . . flow stability  
. . . . . boundary layer stability  
. . . . . flame stability  
. . . . . magnetohydrodynamic stability  
. . . . . . Weibel instability  
. . . . . . Goertler instability  
. . . . . Taylor instability  
. . . . . low speed stability  
. . . . . rotary stability  
. . . . . gyroscopic stability  
. . . . . spacecraft stability  
. . . . . gravitational instability  
. . . flow characteristics  
. . . flow distribution  
. . . flow stability

## dynamic control

- . . . boundary layer stability
- . . . flame stability
- . . . magnetohydrodynamic stability
- . . . . Weibel instability
- . . . Goertler instability
- . . . Taylor instability
- . . flow velocity
- . . . solar wind velocity
- . lift
- . . interference lift
- . . jet lift
- . . rotor lift
- . . zero lift
- . transient response

RT accuracy  
aerodynamic balance  
aerodynamic characteristics  
amplification  
automatic control  
automatic control valves  
bandwidth

- ∞ characteristics
- ∞ control
  - damping
  - distribution (property)
  - dynamic range
- ∞ dynamics
- ∞ equilibrium
- errors
- frequency response
- hysteresis
- impedance
- linearity
- ocean dynamics
- precision
- ∞ properties
- range (extremes)
- reaction time
- reliability
- remote control
- resolution
- resonant frequencies
- rotor dynamics
- sensitivity
- stability
- time constant
- transfer functions

### dynamic control

GS automatic control  
. **dynamic control**

RT adaptive control  
aeroservoelasticity

- ∞ control
- control theory
- ∞ dynamics
- feedback control
- inverse kinematics
- model reference adaptive control
- robot control
- robot dynamics

### dynamic loads

DEF Loads imposed by dynamic action, as distinguished from a static load. Specifically, with respect to aircraft, rockets, or spacecraft, a load due to an acceleration of craft, as imposed by gusts, by maneuvering, by landing, by firing rockets, etc.

GS loads (forces)  
. **dynamic loads**

- . . aerodynamic loads
- . . . blast loads
- . . . gust loads
- . . cyclic loads
- . . rolling contact loads
- . . thrust loads
- . . transient loads
- . . . gust loads
- . . . impact loads
- . . . landing loads
- . . . shock loads
- . . . . blast loads
- . . variable amplitude loading
- . . vibratory loads
- . . wing loading

RT axial compression loads  
axial loads  
compression loads

- critical loading
- ∞ dynamics
- edge loading
- gas-solid interactions
- NASTRAN
- random loads
- static loads
- structural design criteria
- transverse loads
- wind pressure

### dynamic models

DEF Models of aircraft or other objects having their linear dimensions and weight and moments of inertia reproduced in scale in proportion to the original.

GS models  
. **dynamic models**

RT aircraft models  
biological models (mathematics)  
bond graphs

- ∞ dynamics
- large eddy simulation
- mathematical models
- ocean models
- Petri nets
- powered models
- similarity theorem
- spacecraft models
- static models
- systems simulation
- wind tunnel models

### dynamic modulus of elasticity

GS mechanical properties  
. elastic properties  
. . modulus of elasticity  
. . . **dynamic modulus of elasticity**

RT ∞ dynamics  
ultrasonic tests

### dynamic pressure

DEF The pressure of a fluid resulting from its motion, equal to one half the fluid density times the fluid velocity squared. In incompressible flow, dynamic pressure is the difference between total pressure and static pressure.

GS dynamic characteristics  
. **dynamic pressure**  
pressure

RT blast loads  
contact loads

- ∞ dynamics
- impact loads
- kinetic theory
- overpressure
- Riemann waves

### dynamic programming

GS optimization  
. mathematical programming  
. . **dynamic programming**  
research

RT ∞ applications of mathematics  
Bellman theory  
constraints  
critical path method  
decision theory

- ∞ dynamics
- formalism
- linear programming
- mathematical models
- nonlinear systems
- operations research
- ∞ programming
- steepest descent method

### dynamic properties

USE **dynamic characteristics**

### dynamic range

(added August 1991)  
SN (LIMITED TO SIGNAL  
DETECTION/MODULATION)  
DEF The range of a signal detector or transmitter between the smallest and largest detectable signal levels which can be detected without inducing changes in its gain characteristics;

usually expressed in decibels.  
GS range (extremes)  
. **dynamic range**

RT amplification  
amplifiers  
dynamic characteristics  
equipment specifications  
frequency ranges  
frequency response  
microchannel plates  
modulation  
ratios  
signal detection  
signal to noise ratios

### dynamic response

GS responses  
. **dynamic response**  
. . transient response

RT aeroservoelasticity  
amplification  
damping

- ∞ dynamics
- fiber orientation
- frequency domain analysis
- frequency response
- impedance
- modal response
- parameter identification
- ramp functions
- reaction time
- response bias
- rotor dynamics
- sensitivity
- step functions
- stroking tests
- system identification
- time constant
- time domain analysis
- transfer functions

### dynamic stability

DEF The characteristics of a body, such as an aircraft or rocket, that causes it, when disturbed from an original state of steady flight or motion, to damp the oscillations set up by restoring moments and gradually return to its original state; specifically, the aerodynamic characteristics.

GS dynamic characteristics  
. **dynamic stability**

- . . combustion stability
- . . . flame stability
- . . control stability
- . . frequency stability
- . . motion stability
- . . . aerodynamic stability
- . . . aircraft stability
- . . . . hovering stability
- . . . attitude stability
- . . . . directional stability
- . . . . . gyroscopic stability
- . . . . lateral stability
- . . . . longitudinal stability
- . . . flow stability
- . . . . boundary layer stability
- . . . . flame stability
- . . . . magnetohydrodynamic stability
- . . . . . Weibel instability
- . . . . Goertler instability
- . . . . Taylor instability
- . . . low speed stability
- . . . rotary stability
- . . . . gyroscopic stability
- . . . spacecraft stability
- . . gravitational instability
- stability
- . **dynamic stability**
  - . . combustion stability
  - . . . flame stability
  - . . control stability
  - . . frequency stability
  - . . motion stability
  - . . . aerodynamic stability
  - . . . aircraft stability
  - . . . . hovering stability
  - . . . . attitude stability
  - . . . . directional stability
  - . . . . . gyroscopic stability

- . . . . lateral stability
- . . . . longitudinal stability
- . . . . flow stability
- . . . . boundary layer stability
- . . . . flame stability
- . . . . magnetohydrodynamic stability
- . . . . Weibel instability
- . . . . Goertler instability
- . . . . Taylor instability
- . . . . low speed stability
- . . . . rotary stability
- . . . . gyroscopic stability
- . . . . spacecraft stability
- . . . . gravitational instability

RT coning motion  
counterbalances  
damping  
dimensional stability  
drift (instrumentation)

∞ dynamics  
horizontal orientation  
missing mass (astrophysics)  
resonant vibration  
rotor dynamics  
spacecraft motion  
stable oscillations  
static stability  
surface stability  
systems stability  
transient response  
vertical orientation

**dynamic structural analysis**

UF *structural dynamics*  
GS structural analysis  
. **dynamic structural analysis**  
. . flutter analysis

RT aeroservoelasticity

∞ dynamics  
Euler-Bernoulli beams  
flat plates  
Mindlin plates  
shock spectra

**dynamic tests**

RT aerodynamic stability

∞ dynamics  
flight tests  
low speed stability  
motion stability  
spin dynamics  
spin tests  
static tests

∞ tests  
vibration tests

**dynamical systems**

RT attractors (mathematics)  
control theory  
mathematical models  
nonlinear systems  
systems simulation

∞ **dynamics**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Study of the motion of a system of material particles under the influence of forces, especially those which originate outside the system under consideration.

RT aerodynamics  
aerostatics  
aerothermodynamics  
astrodynamics  
biodynamics  
chiral dynamics  
computational fluid dynamics  
continuum mechanics  
dynamic characteristics  
dynamic control  
dynamic loads  
dynamic models  
dynamic modulus of elasticity

dynamic pressure  
dynamic programming  
dynamic response  
dynamic stability  
dynamic structural analysis  
dynamic tests  
elastodynamics  
electrodynamics  
equations of motion  
field theory (physics)  
fluid dynamics  
fluid mechanics  
gas dynamics  
geodynamics  
group dynamics  
Hamiltonian functions  
hemodynamics  
hydrodynamics  
kinematics  
kinetics  
magnetohydrodynamics  
mechanics (physics)  
molecular dynamics  
momentum  
momentum transfer  
nutation  
ocean dynamics  
plasma dynamics  
quantum chromodynamics  
rarefied gas dynamics  
resonant frequencies  
resonant vibration  
robot dynamics  
rotor dynamics  
spin dynamics  
stabilizers (fluid dynamics)  
statics  
terradynamics  
thermodynamics  
variational principles  
velocity  
vibration

**Dynamics Explorer 1 satellite**

DEF A twin satellite of Dynamics Explorer 2 satellite designed to study the magnetosphere, ionosphere, and atmosphere coupling.

GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . Dynamics Explorer satellites  
. . . . **Dynamics Explorer 1 satellite**

**Dynamics Explorer 2 satellite**

DEF A twin satellite of Dynamics Explorer 1 satellite designed to study the magnetosphere, ionosphere, and atmosphere coupling.

GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . Dynamics Explorer satellites  
. . . . **Dynamics Explorer 2 satellite**

**Dynamics Explorer satellites**

DEF Two satellites that have been designed to occupy different orbits and supply comparative data for studying the boundary region between earth and space. Of the 24 goals of the program, one half require both satellite's data, one fourth one satellite's data and one fourth the other satellite's data. The satellites were launched together in August of 1981.

GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . **Dynamics Explorer satellites**  
. . . . Dynamics Explorer 1 satellite  
. . . . Dynamics Explorer 2 satellite

**dynamite**

GS explosives  
. **dynamite**

RT nitroglycerin

**dynamo theory**

RT Earth core  
geomagnetism  
solar convection (astronomy)  
stellar convection  
telluric currents

∞ theories

**dynamometers**

DEF Instruments for measuring power or force; specifically, instruments for measuring the power, torque, or thrust of aircraft engines or rockets. Used for electrodynamicometers.

UF *electrodynamometers*  
GS electric generators  
. rotating generators  
. . **dynamometers**  
. . measuring instruments  
. . **dynamometers**

RT ergometers  
mechanical measurement

∞ test equipment  
thrust measurement  
torquemeters

**dynamos**

USE **rotating generators**

**Dyna-Soar space glider**

USE **X-20 aircraft**

**dynodes**

GS electrodes  
. **dynodes**

RT camera tubes  
photomultiplier tubes  
secondary emission

**Dyson theory**

RT Heisenberg theory  
quantum mechanics

∞ theories

**dyspnea**

DEF Difficult or labored breathing.

GS rates (per time)  
. respiratory rate  
. . **dyspnea**  
. . signs and symptoms  
. . **dyspnea**

**dysprosium**

GS chemical elements  
. rare earth elements  
. . **dysprosium**  
. . . dysprosium isotopes  
metals  
. rare earth elements  
. . **dysprosium**  
. . . dysprosium isotopes

**dysprosium 161**

USE **dysprosium isotopes**

**dysprosium compounds**

GS rare earth compounds  
. **dysprosium compounds**

RT ∞ chemical compounds

∞ metal compounds

**dysprosium isotopes**

UF *dysprosium 161*  
GS chemical elements  
. nuclides  
. . isotopes  
. . . **dysprosium isotopes**  
. . rare earth elements  
. . dysprosium  
. . . **dysprosium isotopes**  
metals  
. rare earth elements  
. . dysprosium  
. . . **dysprosium isotopes**



# E

## E glass

DEF A low alkali lime borosilicate glass made into glass fiber filaments used in composite materials.

- GS glass
  - . **E glass**
  - .. S glass
- RT composite materials
  - glass fiber reinforced plastics
  - glass fibers
  - silicon dioxide

## E layers

USE **E region**

## E region

SN (ALTITUDE RANGE BETWEEN APPROXIMATELY 90 AND 150 KM)  
 DEF A portion of the ionosphere extending from about 90 to 150 km. In daylight, the electron density has one maximum at about 105 km. and is dependent upon solar activity and the solar zenith angle. At night the E region nearly disappears except at high latitudes where particle precipitation can produce ionization at altitudes greater than those experienced under sunlight conditions.

- UF *E layers*
  - night E layer*
- GS Earth atmosphere
  - . upper atmosphere
  - .. Earth ionosphere
  - ... **E region**
  - .... E-1 layer
  - .... E-2 layer
  - .... sporadic E layer regions
  - . **E region**
  - .. E-1 layer
  - .. E-2 layer
  - .. sporadic E layer
- RT lower ionosphere
  - upper ionosphere

## E-1 layer

- GS Earth atmosphere
  - . upper atmosphere
  - .. Earth ionosphere
  - ... E region
  - .... **E-1 layer** regions
  - . E region
  - .. **E-1 layer**
- RT sporadic E layer

## E-2 aircraft

- UF *Hawkeye aircraft*
  - W2F aircraft*
- GS AWACS aircraft
  - . **E-2 aircraft**
  - Grumman aircraft
  - . **E-2 aircraft**
  - jet aircraft
  - . turboprop aircraft
  - .. **E-2 aircraft**
- RT  $\infty$  aircraft
  - command and control
  - early warning systems
  - $\infty$  military aircraft
  - passenger aircraft
  - turboprop engines

## E-2 layer

- GS Earth atmosphere
  - . upper atmosphere
  - .. Earth ionosphere
  - ... E region
  - .... **E-2 layer** regions
  - . E region
  - .. **E-2 layer**
- RT sporadic E layer

## E-3A aircraft

- GS AWACS aircraft
  - . **E-3A aircraft**
  - Boeing aircraft
  - . **E-3A aircraft**
- RT  $\infty$  aircraft

- command and control
- early warning systems
- $\infty$  military aircraft

## E-4A aircraft

- UF *AABNCP*
  - Advanced Airborne Command Post*
  - Boeing 747B aircraft*
- GS AWACS aircraft
  - . **E-4A aircraft**
  - Boeing aircraft
  - . **E-4A aircraft**
- RT  $\infty$  aircraft
  - command and control
  - early warning systems
  - $\infty$  military aircraft

## EAI 680 computer

- GS data processing equipment
  - . computers
  - .. analog computers
  - ... **EAI 680 computer**
  - .. digital computers
  - ... **EAI 680 computer**

## EAI 8400 computer

- GS data processing equipment
  - . computers
  - .. digital computers
  - ... **EAI 8400 computer**

## EAI 8900 computer

- GS data processing equipment
  - . computers
  - .. digital computers
  - ... **EAI 8900 computer**

## EAM (physical chemistry)

(added February 1998)  
 USE **embedded atom method**

## EAP (polymers)

(added June 2000)  
 USE **electroactive polymers**

## ear

- GS anatomy
  - . sense organs
  - .. **ear**
  - ... eardrums
  - ... eustachian tubes
  - ... labyrinth
  - .... cochlea
  - ..... Corti organ
  - ..... otolith organs
  - .... semicircular canals
  - .... vestibules
  - .. middle ear
- RT artificial ears
  - auditory perception
  - endolymph
  - hearing
  - labyrinthectomy
  - mastoids
  - otolaryngology
  - otology

## ear pressure test

- GS physiological tests
  - . **ear pressure test**
- RT middle ear pressure
  - pressure
  - vertigo
  - vestibular tests

## ear protectors

- GS protectors
  - . **ear protectors**
- RT noise injuries
  - noise reduction

## eardrums

- GS anatomy
  - . sense organs
  - .. ear
  - ... **eardrums**
- RT eustachian tubes
  - middle ear pressure

semicircular canals

*Early Apollo Surface Experiments Package*  
 USE **EASEP**

## Early Bird satellites

- GS artificial satellites
  - . active satellites
  - .. SYNCOM satellites
  - ... **Early Bird satellites**
  - . communication satellites
  - .. SYNCOM satellites
  - ... **Early Bird satellites**
  - . synchronous satellites
  - .. SYNCOM satellites
  - ... **Early Bird satellites**
- RT ATS
  - Comsat program

## early stars

- GS celestial bodies
  - . stars
  - .. **early stars**
  - ... hot stars
  - .... A stars
  - .... B stars
  - ..... shell stars
  - ..... Sigma Orionis
  - .... blue stars
  - .... O stars
  - .... white dwarf stars
  - .... Wolf-Rayet stars
- RT late stars
  - main sequence stars
  - star formation

## early warning systems

- GS warning systems
  - . **early warning systems**
  - .. Ballistic Missile Early Warning System
- RT air defense
  - AWACS aircraft
  - Cobra Dane (radar) detection
  - E-2 aircraft
  - E-3A aircraft
  - E-4A aircraft
  - missile detection
  - over-the-horizon radar
  - radar targets
  - radar tracking
  - Synchronous Earth Observatory satellite
  - $\infty$  systems
  - warning

## earphones

DEF Electroacoustic transducers operating from an electrical system to an acoustical system and intended to be closely coupled acoustically to the ear. Used for headsets.

- UF *headsets*
- GS audio equipment
  - . **earphones**
- RT acoustics
  - auditory perception
  - interphones
  - sound transmission
  - telephones

## Earth & Ocean Physics Applications Program

- UF *EOPAP*
- GS programs
  - . NASA programs
  - .. NASA space programs
  - ... **Earth & Ocean Physics Applications Program**
  - . projects
  - .. **Earth & Ocean Physics Applications Program**
  - . space programs
  - .. NASA space programs
  - ... **Earth & Ocean Physics Applications Program**
- RT oceanography

∞ research projects

**Earth (planet)**

DEF That planet of the solar system which is fifth in size of the 9 major planets, and third (between Venus and Mars) in order of distance from the sun (about 93 million miles). Major data for the Earth: equatorial radius: 6,378 kilometers (3,963. 5 miles); polar radius: 6,357 kilometers (3,941 miles); equatorial circumference: 40,075 kilometers (24,902 miles).

- UF *world*
- GS celestial bodies
  - . planets
  - . . terrestrial planets
  - . . . **Earth (planet)**
- RT asteroid collisions
  - Earth sciences
  - Eastern Hemisphere
  - geodesy
  - geoelectricity
  - geography
  - geology
  - geomagnetism
  - geophysics
  - ∞ globes
  - planetary craters
  - polar caps
  - terrestrial radiation
  - Western hemisphere

**Earth albedo**

DEF The fraction of the solar incident radiation that is reflected off the Earth and back into space.

- GS albedo
  - . **Earth albedo**
- RT absorptance
  - cosmic ray albedo
  - Earth radiation budget
  - Earth radiation budget experiment
  - Ebert spectrometers
  - lunar albedo
  - radiative forcing
  - reflectance
  - terrestrial radiation

**Earth analogs**

(added June 2004)

DEF Structures, processes, or phenomena that occur on Earth, or have occurred in the Earths geologic past, extrapolated to other planets.

- GS analogies
  - . **Earth analogs**
- RT astronomical models
  - comparison
  - Earth planetary structure
  - planetary atmospheres
  - planetary geology
  - simulation
  - terrain analysis

**Earth atmosphere**

- GS **Earth atmosphere**
  - . chemosphere
  - . free atmosphere
  - . heterosphere
  - . homosphere
  - . lower atmosphere
  - . . troposphere
  - . . . tropopause
  - . middle atmosphere
  - . . mesosphere
  - . . . mesopause
  - . . stratosphere
  - . . . ozonosphere
  - . . . stratopause
  - . midlatitude atmosphere
  - . primitive Earth atmosphere
  - . upper atmosphere
  - . . Earth ionosphere
  - . . . E region
  - . . . . E-1 layer
  - . . . . E-2 layer
  - . . . . sporadic E layer
  - . . . lower ionosphere
  - . . . . D region
  - . . . upper ionosphere
  - . . . . F region

- . . . . F 1 region
- . . . . F 2 region
- . . exosphere
- . . . thermosphere
- . . . turbopause
- RT acoustic sounding
  - aerospace environments
  - air
  - air pollution
  - air quality
  - airglow
  - ∞ atmospheres
  - atmospheric circulation
  - atmospheric composition
  - atmospheric electricity
  - atmospheric entry
  - Atmospheric General Circulation Experiment
  - auroras
  - bioastronautics
  - CERES (experiment)
  - Earth magnetosphere
  - environments
  - geopotential height
  - global air pollution
  - GRACE mission
  - greenhouse effect
  - meteor trails
  - MISR (radiometry)
  - OPEN Project
  - planetary atmospheres
  - plasmasphere
  - radiation belts
  - satellite atmospheres
  - scale height
  - superrotation
  - teleconnections (meteorology)
  - weathering

**Earth axis**

DEF Any one of a set of mutually perpendicular reference axes established with the upright axis (the Z axis) pointing to the center of the Earth, used in describing the position or performance of an aircraft or other body in flight. The Earth axes may remain fixed or may move with the aircraft or other object.

- GS axes (reference lines)
  - . axes of rotation
  - . . **Earth axis**
- RT Chandler wobble
  - coordinates
  - Earth orientation
  - geodesy
  - polar wandering (geology)

**Earth core**

- GS cores
  - . planetary cores
  - . . **Earth core**
  - lithosphere
  - . **Earth core**
- RT core-mantle boundary
  - dynamo theory
  - geophysical fluids
  - structural properties (geology)

**Earth crust**

- UF *crustal dynamics*
- GS crusts
  - . planetary crusts
  - . . **Earth crust**
  - lithosphere
  - . **Earth crust**
- RT coesite
  - continental drift
  - core sampling
  - cratons
  - crustal fractures
  - Earth mantle
  - earthquake damage
  - faults (geology)
  - lunar crust
  - massifs
  - plates (tectonics)
  - San Andreas Fault
  - sea floor spreading
  - stishovite

structural properties (geology)

**Earth cryosphere**

(added June 1996)

DEF The part of the Earths surface that is perennially frozen - the zone of the Earth where ice and frozen ground are formed.

- RT air land interactions
  - air water interactions
- ∞ cryospheres
  - ice environments
  - meteorology
  - permafrost
  - polar caps
  - snow cover

*Earth currents*

USE **telluric currents**

*Earth Energy Budget Experiment*

USE **LZEEBE satellite**

**Earth environment**

- GS environments
  - . **Earth environment**
- RT air pollution
  - arid lands
  - desertification
  - magnetosheath

*Earth figure*

USE **geodesy**

**Earth gravitation**

- GS gravitation
  - . **Earth gravitation**
- RT geomagnetism
  - geopotential
  - geopotential height
  - GRACE mission
  - gravitational fields
  - gravity anomalies

**Earth hydrosphere**

DEF That part of the Earth that consists of the oceans, seas, lakes, and rivers. Used for hydrosphere (Earth).

- UF *hydrosphere (Earth)*
- RT biosphere
  - hydrological cycle
  - hydrology
  - lakes
  - limnology
  - oceans
  - seas

**Earth ionosphere**

- SN (ALTITUDES ABOVE APPROXIMATELY 50 KM)
- GS Earth atmosphere
  - . upper atmosphere
  - . . **Earth ionosphere**
  - . . . E region
  - . . . . E-1 layer
  - . . . . E-2 layer
  - . . . . sporadic E layer
  - . . . lower ionosphere
  - . . . . D region
  - . . . upper ionosphere
  - . . . . F region
  - . . . . . F 1 region
  - . . . . . F 2 region
- RT atmospheric ionization
  - chemosphere
  - CRRES (satellite)
  - Earth magnetosphere
  - Earth-ionosphere waveguide
  - electrojets
  - exosphere
  - field aligned currents
  - heterosphere
  - homosphere
  - Intasat satellite
  - ion concentration
  - ion density (concentration)
  - ∞ ionospheres
  - ionospheric propagation
  - ionospheric storms
  - ∞ layers
  - magnetosphere-ionosphere coupling
  - mesosphere

## Earth limb

midlatitude atmosphere  
Polar/GGS spacecraft  
regions  
satellite atmospheres  
shear layers  
space weather  
thermosphere

### Earth limb

GS planetary limb  
. **Earth limb**  
RT astronomy  
libration  
∞ limbs

### Earth magnetosphere

GS environments  
. **Earth magnetosphere**  
. . . geomagnetic tail  
. . . magnetopause  
. . . magnetosheath  
RT AMPTE (satellites)  
barium ion clouds  
Chapman-Ferraro problem  
Cluster Mission  
corotation  
CRRES (satellite)  
Earth atmosphere  
Earth ionosphere  
exosphere  
field aligned currents  
geomagnetic hollow  
geomagnetism  
GEOS satellites (ESA)  
heterosphere  
IMAGE satellite  
International Magnetospheric Explorer  
International Magnetospheric Study  
KP index  
magnetic fields  
magnetosphere-ionosphere coupling  
∞ magnetospheres  
neutral sheets  
OPEN Project  
planetary magnetospheres  
plasma clouds  
plasmopause  
plasma sphere  
polar cusps  
Polar/GGS spacecraft  
radiation belts  
radiation trapping  
satellite atmospheres  
screen effect  
solar planetary interactions  
solar terrestrial interactions  
solar wind velocity  
space plasmas  
space weather  
thermosphere  
Wind/GGS spacecraft

### Earth magnetotail

USE **geomagnetic tail**

### Earth mantle

DEF The zone of the Earth below the crust and above the core (to a depth of 3480 km), which is divided into the upper mantle and the lower mantle, with a transition zone between. Used for mantle (Earth structure).

UF *mantle (Earth structure)*  
GS lithosphere  
. **Earth mantle**  
planetary mantles  
. **Earth mantle**  
RT asthenosphere  
coesite  
core-mantle boundary  
Earth crust  
lunar mantle  
plates (tectonics)  
regolith  
sea floor spreading  
siderophile elements  
stishovite  
structural properties (geology)

subduction (geology)

### ∞ Earth motion

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT Chandler wobble  
Earth movements  
Earth orientation  
Earth rotation  
polar wandering (geology)  
solar orbits

### Earth movements

GS **Earth movements**  
. earthquakes  
. landslides  
RT avalanches  
crevasses  
crustal fractures  
∞ Earth motion  
earthquake damage  
geodynamics  
large aperture seismic array  
neotectonics  
sea floor spreading  
seismic waves  
seismology  
tectonics  
tsunami waves

### Earth observations (from space)

DEF The acquisition of Earth surface data from aircraft or spacecraft.

GS observation  
. **Earth observations (from space)**  
. . . satellite observation  
RT aerial photography  
Aqua spacecraft  
Aura spacecraft  
CALIPSO (Pathfinder satellite)  
CERES (experiment)  
CLARREO (observatory)  
CloudSat  
data acquisition  
Earth Observing System (EOS)  
Earthnet  
Feature Identification and Location  
Exper  
International Geosphere-Biosphere  
program  
Landsat satellites  
MODIS (radiometry)  
multispectral band scanners  
multispectral photography  
observation scheduling  
photography  
Shuttle Imaging Radar  
SPOT (French satellite)  
Terra spacecraft

### Earth Observing System (EOS)

DEF NASA's orbital multisensor observatory system for the long term acquisition of Earth sciences data to be operated in conjunction with an integrated ground-based science information system. This international system will become operational in 1995 when the first of four polar platforms will be launched. The first and third will be launched under U.S. auspices. The second under ESA auspices and the last under Japanese auspices.

UF *EOS*  
GS **Earth Observing System (EOS)**  
. Aqua spacecraft  
. Aura spacecraft  
. CALIPSO (Pathfinder satellite)  
. CloudSat  
. Terra spacecraft  
RT Advanced Microwave Sounding Unit  
CERES (experiment)  
CLARREO (observatory)  
data products  
Earth observations (from space)  
EOS data and information system  
Ice, Cloud and Land Elevation  
Satellite  
information systems  
Landsat 6  
Landsat 7

MISR (radiometry)  
Mission to Planet Earth  
remote sensing  
space platforms  
space station payloads  
space station polar platforms

### Earth orbital environments

UF *GEO environments*  
*Geosynchronous Earth Orbital Environments*  
*LEO environments*  
*low Earth orbital environments*  
GS environments  
. aerospace environments  
. . . **Earth orbital environments**  
. extraterrestrial environments  
. . . **Earth orbital environments**  
RT extraterrestrial radiation  
low Earth orbits  
microgravity  
near Earth objects  
space weather  
spacecraft glow

### Earth orbital rendezvous

UF *EOR (rendezvous)*  
GS maneuvers  
. orbital maneuvers  
. . . orbital rendezvous  
. . . . **Earth orbital rendezvous**  
rendezvous  
. space rendezvous  
. . . orbital rendezvous  
. . . . **Earth orbital rendezvous**  
RT lunar orbital rendezvous  
orbital mechanics  
rendezvous trajectories  
spacecraft trajectories  
transfer orbits

### Earth orbiting space stations

USE **space stations**

### Earth orbits

SN (ORBITS AROUND THE EARTH)  
GS orbits  
. **Earth orbits**  
. . . geosynchronous orbits  
. . . low Earth orbits  
. . . twenty-four hour orbits  
RT apogees  
Apollo asteroids  
circular orbits  
circumlunar trajectories  
elliptical orbits  
equatorial orbits  
Hansen lunar theory  
Hill lunar theory  
Hill method  
lunar orbits  
Near Earth Asteroid Rendezvous  
Mission  
orbital lifetime  
orbital mechanics  
parking orbits  
perigees  
planetary orbits  
polar orbits  
satellite orbits  
spacecraft orbits  
stationary orbits  
transfer orbits

### Earth orientation

RT Chandler wobble  
Earth axis  
∞ Earth motion  
Earth rotation  
nutaton  
polar wandering (geology)  
precession

### Earth planetary structure

RT asthenosphere  
continental drift  
Earth analogs  
geology  
geophysics  
hydrology

- lithosphere
- oceanography
- planetary composition
- planetary structure
- plates (tectonics)
- primitive Earth atmosphere
- structural properties (geology)
- ∞ structures
- tectonics

*Earth radiation*

USE **terrestrial radiation**

**Earth radiation budget**

- GS energy budgets
  - . **Earth radiation budget**
- RT atmospheric heat budget
  - atmospheric radiation
- ∞ budgets
  - CERES (experiment)
  - Earth albedo
  - Earth radiation budget experiment
  - heat budget
  - radiative forcing
  - Surface Meteorology and Solar Energy project
  - Surface Radiation Budget project
  - terrestrial radiation
  - TRMM satellite

**Earth radiation budget experiment**

DEF Radiation measurements to determine the spatial and temporal variations of the Earth's radiance. The measurements have continued for the past two decades beginning with Explorer 7 in 1959 and through Nimbus 6 and 7. Used for ERBE.

- UF *ERBE*
- GS payloads
  - . Space Shuttle payloads
  - . . **Earth radiation budget experiment**
- RT albedo
  - CERES (experiment)
  - Earth albedo
  - Earth radiation budget
- ∞ radiation
  - radiation measuring instruments
  - terrestrial radiation

**Earth resources**

DEF Power sources and renewable or non-renewable materials occurring naturally on Earth.

- GS resources
  - . **Earth resources**
  - . . forests
  - . . . rain forests
  - . . fossil fuels
  - . . . coal
  - . . . . anthracite
  - . . . . lignite
  - . . . . solvent refined coal
  - . . . crude oil
  - . . . natural gas
  - . . . liquefied natural gas
  - . . . peat
  - . . . shale oil
  - . . glaciers
  - . . icebergs
  - . . kerogen
  - . . land ice
  - . . marine resources
  - . . oil fields
  - . . range resources
  - . . springs (water)
  - . . tar sands
  - . . thermal resources
  - . . . geothermal resources
  - . . . . geysers
  - . . underwater resources
  - . . water resources
  - . . . aquifers
- RT alfalfa
  - arid lands
  - Baltic Shield (Europe)
  - bedrock
  - birds
  - brush (botany)
  - chaparral

- coastal ecology
- coastal plains
- corn
- cotton
- crop growth
- crop identification
- deciduous trees
- deserts
- Earthnet
- energy policy
- energy technology
- environment management
- environment pollution
- environmental surveys
- EROS (satellites)
- farm crops
- farmlands
- fishes
- flats (landforms)
- ∞ food
  - forest management
  - geographic applications program
  - geothermal energy conversion
  - grains (food)
  - granite
  - grasslands
  - Great Basin (US)
  - Great Lakes (North America)
  - Great Salt Lake (UT)
  - ground water
  - habitats
  - hay
  - ice mapping
  - imagery
  - kettles (geology)
  - keys (islands)
  - land use
  - Large Area Crop Inventory Experiment
  - lava
  - leguminous plants
  - limestone
  - mammals
  - marshlands
  - millet
  - mineral deposits
  - minerals
  - Mississippi River (US)
  - NASA Interactive Planning System
  - oats
  - oceanography
  - photography
  - photomapping
  - plants (botany)
  - reconnaissance
  - regolith
  - remote sensing
  - remote sensors
  - resources management
  - rivers
  - rocks
  - rural land use
  - sands
  - sandstones
  - scanning
  - shales
  - soils
  - sorghum
  - spaceborne photography
  - spectral reconnaissance
  - SPOT (French satellite)
  - strip mining
  - sugar beets
  - sugar cane
  - sunflowers
  - surface water
  - surveillance
  - terrain analysis
  - thermal mapping
  - tidewater
  - timber identification
  - timber inventory
  - tributaries
  - vegetation
  - vineyards
  - waterwave energy
  - waterwave energy conversion
  - wharves

windpower utilization

*Earth Resources Experiment Package*  
USE **EREP**

**Earth Resources Information System**

- GS information systems
  - . **Earth Resources Information System**
- RT data systems
  - EOS data and information system
  - NASA programs
  - programs
  - Skylab program
- ∞ systems

*Earth Resources Observation Satellites*

USE **EROS (satellites)**

**Earth Resources Program**

- GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . **Earth Resources Program**
  - . . . . Earth Resources Survey Program
  - . . . . . SEASAT program
  - . . space programs
  - . . NASA space programs
  - . . . **Earth Resources Program**
  - . . . . Earth Resources Survey Program
  - . . . . . SEASAT program
- RT Apollo applications program
  - change detection
  - geographic applications program
  - infrared radiometers
  - Large Area Crop Inventory Experiment
  - plant stress
  - satellite observation
  - Skylab program

*Earth resources shuttle imaging radar*

USE **Shuttle Imaging Radar**

**Earth Resources Survey aircraft**

- RT aerial photography
  - aerial reconnaissance
- ∞ aircraft
  - photogeology
  - photoreconnaissance
  - reconnaissance aircraft

**Earth Resources Survey Program**

- GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . Earth Resources Program
  - . . . . **Earth Resources Survey Program**
  - . . . . . SEASAT program
  - . . space programs
  - . . NASA space programs
  - . . . Earth Resources Program
  - . . . . **Earth Resources Survey Program**
  - . . . . . SEASAT program
- RT Apollo applications program
  - Skylab program

*Earth Resources Technology Satellite 1*

USE **Landsat 1**

*Earth Resources Technology Satellite B*

USE **Landsat 2**

*Earth Resources Technology Satellite C*

USE **Landsat 3**

*Earth Resources Technology Satellite D*

USE **Landsat 4**

*Earth Resources Technology Satellite E*

USE **Landsat E**

*Earth Resources Technology Satellite F*

USE **Landsat F**

*Earth Resources Technology Satellites*

USE **Landsat satellites**

**Earth rotation**

- GS gyration

## Earth sciences

- . rotation
- . . **Earth rotation**
- RT Chandler wobble
- ∞ Earth motion
- Earth orientation
- sidereal time
- superrotation

**Earth sciences**  
(added December 1991)

- RT atmospheric physics
- Earth (planet)
- ecology
- geochemistry
- geodynamics
- geology
- geomagnetism
- geophysics
- hydrodynamics
- hydrology
- meteorology
- oceanography
- seismology

*Earth shape*

- USE **geodesy**

**Earth surface**

- GS lithosphere
- . **Earth surface**
- RT cratons
- crustal fractures
- equatorial regions
- geodetic accuracy
- marshlands
- ocean surface
- planetary surfaces
- structural properties (geology)
- ∞ surfaces
- terradyamics
- topography

**Earth terminal measurement system**

DEF NBS system for measuring electromagnetic parameters of communication satellites and ground stations relative to antenna gain, ratio of carrier power to operating noise temperature, and satellite effective isotropic power.

- RT communication satellites
- electromagnetic measurement
- electronic equipment tests
- ground support equipment
- ∞ measurement
- radio relay systems
- ∞ systems
- ∞ test equipment

**Earth terminals**

DEF Portable or stationary ground-based equipment used to transmit and receive signals and other data via satellites in communications networks.

- GS stations
- . ground stations
- . . **Earth terminals**
- RT carrier to noise ratios
- communication equipment
- radio relay systems
- satellite communication
- satellite transmission
- spacecraft communication
- television systems
- VSAT (network)

**Earth tides**

- GS tides
- . **Earth tides**
- RT atmospheric tides
- lunar tides

**Earth Viewing Applications Laboratory**

- UF *EVAl*
- GS laboratories
- . space laboratories
- . . **Earth Viewing Applications Laboratory**
- payloads
- . Space Shuttle payloads

- . . **Earth Viewing Applications Laboratory**
- RT SAIL project

**Earth-ionosphere waveguide**  
(added August 1991)

DEF A natural waveguide consisting of the atmospheric duct formed by the ionospheric D region and the surface of the Earth making possible long-range communications in the 10KHz frequency range.

- GS waveguides
- . **Earth-ionosphere waveguide**
- RT D region
- Earth ionosphere
- ionospheric propagation
- plasmaguides
- radio transmission
- very low frequencies

**Earth-Mars trajectories**

- GS trajectories
- . spacecraft trajectories
- . . interplanetary trajectories
- . . . **Earth-Mars trajectories**
- RT elliptical orbits
- Mars exploration
- Mars missions
- orbital mechanics
- transfer orbits

**Earth-Mercury trajectories**

- GS trajectories
- . spacecraft trajectories
- . . interplanetary trajectories
- . . . **Earth-Mercury trajectories**
- RT elliptical orbits
- orbital mechanics
- transfer orbits

**Earth-Moon system**

- RT Charon
- gravitational fields
- gravitational waves
- lunar retroreflectors
- moon
- natural satellites
- orbital mechanics
- solar system
- ∞ systems
- two body problem

**Earth-Moon trajectories**

- GS trajectories
- . spacecraft trajectories
- . . lunar trajectories
- . . . **Earth-Moon trajectories**
- RT Apollo 5 flight
- Apollo 6 flight
- Apollo 7 flight
- Apollo 8 flight
- Apollo 9 flight
- Apollo 10 flight
- Apollo 11 flight
- Apollo 12 flight
- Apollo 13 flight
- Apollo 14 flight
- Apollo 15 flight
- Apollo 16 flight
- Apollo 17 flight
- circumlunar trajectories
- cislunar space
- interplanetary trajectories
- lunar flight
- lunar orbits
- moon-Earth trajectories
- parking orbits
- rendezvous trajectories
- round trip trajectories
- transfer orbits

**Earthnet**

- RT Earth observations (from space)
- Earth resources
- ESA satellites
- European space programs
- Landsat satellites
- remote sensors

- synthetic aperture radar

**earthquake damage**

- GS damage
- . **earthquake damage**
- RT Earth crust
- Earth movements
- geological faults
- microseisms
- seismic energy
- seismic waves
- seismology
- shock waves
- tsunami waves

**earthquake resistance**

DEF Structural strength of natural geological formations reacting to seismic forces.

- GS mechanical properties
- . **earthquake resistance**
- RT crustal fractures
- earthquakes
- fracture strength
- impact strength
- landforms
- ∞ resistance
- seismic waves
- shock resistance
- shock waves
- tremors

**earthquake resistant structures**

DEF Buildings and other structures designed for maximum safety and protection from the effects of earthquakes.

- RT concrete structures
- elastic bending
- ∞ elastic systems
- seismic waves
- shock waves
- structural vibration
- ∞ structures

**earthquakes**

DEF Sudden motions or tremblings in the Earth caused by the abrupt release of slowly accumulated strain.

- GS Earth movements
- . **earthquakes**
- RT crustal fractures
- earthquake resistance
- geological faults
- large aperture seismic array
- microseisms
- planetary quakes
- plates (tectonics)
- Rouse belts
- San Andreas Fault
- San Andreas Fault experiment
- seismic waves
- seismology
- shock waves
- subduction (geology)
- tremors
- tsunami waves

**Earth-Venus trajectories**

- GS trajectories
- . spacecraft trajectories
- . . interplanetary trajectories
- . . . **Earth-Venus trajectories**
- RT ∞ astronautics
- flight optimization
- interplanetary flight
- ∞ missions
- orbits
- space missions
- space navigation
- spacecraft reentry
- transfer orbits

**EASEP**

- UF *Early Apollo Surface Experiments Package*
- GS packages
- . instrument packages
- . . **EASEP**
- RT ∞ instruments
- lunar exploration
- payloads

∞ surfaces

**East Germany**  
 UF *German Democratic Republic*  
*Peoples Democratic Republic of Germany*

GS nations  
 . **East Germany**

RT Central Europe  
 Europe  
 German space program  
 Germany  
 West Germany

*East Pakistan*  
 USE **Bangladesh**

**Eastern Hemisphere**  
 RT Earth (planet)  
 geography  
 ∞ hemispheres  
 Western hemisphere

**eating**  
 GS ingestion (biology)  
 . **eating**

RT digesting

∞ food  
 mastication  
 space flight feeding  
 swallowing  
 synthetic food

**Ebert spectrometers**  
 GS measuring instruments  
 . optical measuring instruments  
 . . **Ebert spectrometers**  
 . radiation measuring instruments  
 . . **Ebert spectrometers**  
 . spectrometers  
 . . **Ebert spectrometers**  
 optical equipment  
 . optical measuring instruments  
 . . **Ebert spectrometers**

RT Earth albedo  
 filter wheel infrared spectrometers  
 infrared spectrometers  
 ultraviolet spectrometers

*EBF*  
 USE **externally blown flaps**

*EBR-1 reactor*  
 USE **Experimental Breeder Reactor 1**

*EBR-2 reactor*  
 USE **Experimental Breeder Reactor 2**

*ebullition*  
 USE **boiling**

*EBWR (reactor)*  
 USE **experimental boiling water reactors**

*EC-121 aircraft*  
 USE **C-121 aircraft**

*EC-135 aircraft*  
 USE **C-135 aircraft**

*Eccentric Geophysical Observatory*  
 USE **EGO**

*Eccentric Orbit Geophysical Observatory*  
 USE **EGO**

**eccentric orbits**  
 GS orbits  
 . **eccentric orbits**

RT circular orbits  
 elliptical orbits  
 Exosat satellite  
 Lissajous figures

**eccentricity**  
 RT abnormalities  
 asymmetry  
 balancing  
 concentricity  
 deviation  
 ellipticity

elongation  
 skewness  
 symmetry  
 variability  
 variations

**eccentrics**  
 UF *cranks*  
 RT cams  
 linkages

**echelette gratings**  
 GS gratings (spectra)  
 . **echelette gratings**

RT diffraction  
 echelle gratings  
 reflection

**echelle gratings**  
*(added August 1988)*  
 GS gratings (spectra)  
 . **echelle gratings**

RT diffraction  
 echelette gratings  
 reflection

*echelon faults*  
 USE **geological faults**

*Echo 1 carrier rocket*  
 USE **Thor Delta launch vehicle**

**Echo 1 satellite**  
 UF *A-11 satellite*  
 GS artificial satellites  
 . passive satellites  
 . . Echo satellites  
 . . . **Echo 1 satellite**

RT Thor Delta launch vehicle

**Echo 2 satellite**  
 UF *A-12 satellite*  
 GS artificial satellites  
 . passive satellites  
 . . Echo satellites  
 . . . **Echo 2 satellite**  
 unmanned spacecraft  
 . **Echo 2 satellite**

**Echo project**  
 GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Echo project**  
 . projects  
 . . **Echo project**  
 . space programs  
 . . NASA space programs  
 . . . **Echo project**

RT communication satellites  
 passive satellites

**Echo satellites**  
 GS artificial satellites  
 . passive satellites  
 . . **Echo satellites**  
 . . . Echo 1 satellite  
 . . . Echo 2 satellite

RT Agena B rocket vehicle  
 Agena rocket vehicles

**echo sounding**  
 GS sounding  
 . **echo sounding**

RT deep scattering layers  
 depth measurement  
 echoes  
 navigation aids  
 sodar  
 sonar  
 sound localization  
 sound ranging  
 underwater acoustics

**echo suppressors**  
 GS circuits  
 . **echo suppressors**  
 suppressors  
 . **echo suppressors**

RT noise reduction  
 pulse radar

radiotelephones  
 sonar  
 switches  
 telephony  
 voice communication

**echocardiography**  
 GS bioengineering  
 . biometrics  
 . . cardiography  
 . . . phonocardiography  
 . . . . **echocardiography**

RT cardiac ventricles  
 heart diseases  
 heart function

**echoencephalography**  
 DEF A diagnostic technique in which pulses of ultrasonic waves are beamed through the head from both sides, and echoes from the midstructures of the brain are recorded as graphic tracings.

GS bioengineering  
 . biometrics  
 . . **echoencephalography**

RT bioinstrumentation  
 brain  
 electrophysiology  
 medical electronics  
 medical equipment

**echoes**  
 DEF Waves that have been reflected or otherwise returned with sufficient magnitude and delay to be detected as a wave distinct from that directly transmitted. In radar, a pulse of reflected radiofrequency energy; the appearance on a radar indicator of the energy returned from a target.

GS **echoes**  
 . auroral echoes  
 . lunar echoes  
 . . lunar radar echoes  
 . radar echoes  
 . . angels (radar)  
 . . clutter  
 . . lunar radar echoes  
 . . solar radar echoes  
 . . Venus radar echoes  
 . radio echoes  
 . signal reflection

RT acoustics  
 cepstral analysis  
 echo sounding  
 ground effect (communications)  
 noise (sound)  
 reverberation

**eclipse project**  
 GS programs  
 . projects  
 . . **eclipse project**

**eclipses**  
 DEF The reductions in visibility or disappearances of nonluminous bodies by passing into the shadows cast by another nonluminous body. The apparent cutting off, wholly or partially, of the light from a luminous body by a dark body coming between it and the observer.

GS **eclipses**  
 . lunar eclipses  
 . solar eclipses

RT eclipsing binary stars  
 lunar shadow  
 occultation  
 penumbras  
 umbras

**eclipsing binary stars**  
 GS celestial bodies  
 . stars  
 . . double stars  
 . . . binary stars  
 . . . . **eclipsing binary stars**  
 . . . . . dwarf novae  
 . . . . . Lambda Tauri stars  
 . . . . . Zeta Aurigae star

RT accretion disks  
 cataclysmic variables

## ecliptic

eclipses  
stellar occultation  
superhumps (astronomy)  
symbiotic stars  
variable stars  
x ray binaries

### ecliptic

DEF The apparent annual path of the sun among the stars; the intersection of the plane of the Earth's orbit with the celestial sphere. The ecliptic is a great circle of the celestial sphere inclined at an angle of about 23 degrees 27 minutes to the celestial equator.

RT planets  
solar orbits  
zodiac

### eclogite

GS rocks  
. igneous rocks  
. . . **eclogite**  
RT gadolinium-gallium garnet  
garnets  
pyroxenes  
soils

### ecological systems

USE **ecosystems**

### ecology

DEF The study of the environmental relations of organisms. Used for ecological systems.

GS **ecology**  
. coastal ecology  
RT biochemical oxygen demand  
∞ biology  
biometeorology  
carbon cycle  
Central Atlantic Regional Ecol Test Site  
closed ecological systems  
coastal plains  
Earth sciences  
ecosystems  
endangered species  
energy policy  
environments  
Gaia hypothesis  
habitability  
habitats  
phenology  
predators  
symbiosis  
vegetation growth

### e-commerce

(added April 2000)

USE **electronic commerce**

### econometrics

DEF The application of mathematics and statistical techniques to the testing and quantifying of economic theories and the solution of economic problems.

RT ∞ applications of mathematics  
economics  
gross national product  
statistical correlation

### economic analysis

RT allocations  
comparison  
cost analysis  
cost estimates  
costs  
economy  
efficiency  
management  
operating costs  
value engineering

### economic development

RT commerce  
developing nations  
economy  
geographic distribution  
geography  
industries  
land use

manufacturing  
resources  
space industrialization  
urban development

### economic factors

RT allocations  
budgeting  
commercial energy  
costs  
developing nations  
domestic energy  
economy  
efficiency  
energy policy  
feasibility analysis  
industrial energy  
insurance (contracts)  
management  
reserves  
resources  
transportation energy

### economic impact

DEF The impact on the economy from whatever cause.

GS impact  
. **economic impact**  
RT costs  
environments  
industries  
investments  
resources

### economics

DEF Study of the production, distribution, and consumption of goods and services.

GS **economics**  
. demand (economics)  
RT costs  
econometrics  
evaluation  
fiduciaries  
income  
international trade  
investments  
prejudices  
progress  
recession  
resources  
statistical analysis

### economy

RT cost estimates  
decision making  
economic analysis  
economic development  
economic factors  
financial management  
low cost  
management planning  
recycling

### ecosystems

UF *ecological systems*  
RT closed ecological systems  
ecology  
endangered species  
food chain  
Gaia hypothesis  
predators  
∞ systems

### ECS

USE **European Communications Satellite**

### Ecuador

GS nations  
. **Ecuador**  
RT South America

### eddies

USE **vortices**

### Eddington approximation

GS analysis (mathematics)  
. numerical analysis  
. . . approximation

### . . . Eddington approximation

### eddy currents

SN (LIMITED TO ELECTRIC CURRENTS)  
DEF Electric currents caused to flow in a conductor by the time or space variation, or both, of an applied magnetic field.

GS electric current  
. **eddy currents**  
RT braking  
electric conductors  
electrical properties  
hysteresis  
losses  
magnetic properties  
∞ physical properties  
plasma currents  
vorticity transport hypothesis

### eddy diffusion

USE **turbulent diffusion**

### eddy viscosity

DEF The turbulent transfer of momentum by eddies giving rise to an internal fluid friction, in a manner analogous to the action of molecular viscosity in laminar flow, but taking place on a much larger scale.

GS transport properties  
. viscosity  
. . . **eddy viscosity**  
RT Baldwin-Lomax turbulence model  
flow characteristics  
flow resistance  
internal friction  
large eddy simulation  
turbulent flow  
viscous drag  
viscous flow

### edema

GS signs and symptoms  
. **edema**  
RT body fluids  
diuresis  
water balance

### edge cracks

(added October 1997)

GS fractures (materials)  
. cracks  
. . . **edge cracks**  
RT cracking (fracturing)  
edge loading  
edges  
stress intensity factors  
surface cracks

### edge detection

(added January 1990)

UF *boundary detection (imagery)*  
GS detection  
. **edge detection**  
RT computer vision  
image analysis  
image processing  
pattern recognition  
scene analysis

### edge dislocations

UF *slip bands*  
GS defects  
. crystal defects  
. . . crystal dislocations  
. . . **edge dislocations**  
dislocations (materials)  
. crystal dislocations  
. . . **edge dislocations**  
RT ∞ bands  
kink bands  
screw dislocations

### edge loading

GS loads (forces)  
. **edge loading**  
RT aerodynamic loads  
compression loads  
dynamic loads  
edge cracks  
static loads

wing loading

**edges**  
 GS **edges**  
 . leading edges  
 . . blunt leading edges  
 . . sharp leading edges  
 . trailing edges  
 . . blunt trailing edges

RT edge cracks  
 margins  
 rims  
 scalloping  
 sides  
 tips

**editing**  
 RT data processing  
 data reduction  
 editing routines (computers)  
 format  
 technical writing

**editing routines (computers)**  
 GS computer programs  
 . **editing routines (computers)**  
 RT computer systems programs  
 data processing  
 editing

**EDTA**  
 USE **ethylenediaminetetraacetic acids**

**education**  
 UF *instructions*  
*teaching*  
*training*  
 GS **education**  
 . ejection training  
 . flight training  
 . . pilot training  
 . . space flight training  
 . . . astronaut training  
 . gunnery training  
 . maintenance training  
 . programmed instruction  
 . . computer assisted instruction

RT behavior  
 communicating  
 creativity  
 educational resources  
 experience  
 human factors engineering  
 human resources  
 instructors  
 knowledge  
 learning  
 learning theory  
 lectures  
 memory  
 ∞ orientation  
 psychometrics  
 qualifications  
 retraining  
 safety management  
 schools  
 students  
 ∞ tests  
 textbooks  
 training analysis  
 training devices  
 transfer of training  
 universities

**educational resources**  
*(added April 2004)*  
 DEF Products produced for educational or training purposes.  
 GS **educational resources**  
 . textbooks  
 RT education  
 learning  
 manuals

**educational television**  
 GS telecommunication  
 . **educational television**  
 television systems  
 . **educational television**  
 RT closed circuit television

color television  
 communication equipment  
 learning  
 networks  
 stereotelevision  
 training devices

**EEG (electroencephalograms)**  
 USE **electroencephalography**

**effective perceived noise levels**  
 UF *EPNL*  
 GS level (quantity)  
 . **effective perceived noise levels**  
 RT acoustic measurement  
 acoustics  
 loudness  
 ∞ noise  
 noise (sound)  
 noise intensity  
 noise reduction  
 sound intensity

**effectiveness**  
 GS **effectiveness**  
 . cost effectiveness  
 . system effectiveness  
 RT antenna gain  
 efficiency

∞ **effectors**  
*(added September 1989)*  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT actuators  
 control equipment  
 end effectors  
 manipulators

∞ **effects**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 UF *affects*  
 RT atmospheric effects  
 Auger effect  
 Barkhausen effect  
 Bauschinger effect  
 biological effects  
 Brillouin effect  
 brown wave effect  
 capture effect  
 causes  
 Cerenkov radiation  
 chemical effects  
 Coanda effect  
 compressibility effects  
 Compton effect  
 Coriolis effect  
 diffusion  
 Doppler effect  
 Doppler-Fizeau effect  
 electro-optical effect  
 environment effects  
 Ettingshausen effect  
 Faraday effect  
 field effect transistors  
 Fizeau effect  
 Forbush decreases  
 galvanomagnetic effects  
 gravitational effects  
 green wave effect  
 greenhouse effect  
 ground effect (aerodynamics)  
 ground effect (communications)  
 ground effect machines  
 Gunn effect  
 Hall effect  
 hydrodynamic ram effect  
 isotope effect  
 Jahn-Teller effect  
 jet blast effects  
 Joule-Thomson effect  
 ∞ Kerr effects  
 Kerr electrooptical effect  
 Kerr magneto-optical effect  
 Kirkendall effect  
 Kondo effect  
 long term effects  
 lunar effects

lunar gravitational effects  
 Luxembourg effect  
 magnetic effects  
 Magnus effect  
 Moire effects  
 Mossbauer effect  
 Nernst-Ettingshausen effect  
 nonohmic effect  
 nuclear explosion effect  
 Overhauser effect  
 pathological effects  
 Peltier effects  
 Penning effect  
 photoelectric effect  
 photoelectromagnetic effects  
 photomagnetic effects  
 photomechanical effect  
 photovoltaic effect  
 physiological effects  
 pinch effect  
 POGO effects  
 Portevin-le Chatelier effect  
 Poynting-Robertson effect  
 pressure effects  
 proximity effect (electricity)  
 psychological effects  
 radiation effects  
 Ramsauer effect  
 reentry effects  
 relativistic effects  
 scale effect  
 Schach effect  
 screen effect  
 Seebeck effect  
 solar activity effects  
 Stark effect  
 sterilization effects  
 Suhl effect  
 Sunyaev-Zeldovich effect  
 surface effect ships  
 surface roughness effects  
 sweep effect  
 temperature effects  
 thermoacoustic effects  
 thermomagnetic effects  
 turbulence effects  
 Umkehr effect  
 vacuum effects  
 vibration effects  
 view effects  
 Voigt effect  
 wind effects  
 Zeeman effect  
 Zener effect

**efferent nervous systems**  
 UF *motor systems (biology)*  
 GS anatomy  
 . nervous system  
 . . **efferent nervous systems**  
 RT sensorimotor performance  
 ∞ systems

**effervescence**  
 RT boiling  
 bubbles  
 surface properties

**efficiency**  
 GS **efficiency**  
 . charge efficiency  
 . combustion efficiency  
 . compressor efficiency  
 . energy conversion efficiency  
 . nozzle efficiency  
 . power efficiency  
 . propulsive efficiency  
 . . propeller efficiency  
 . thermodynamic efficiency  
 . transmission efficiency  
 RT aircraft production costs  
 comfort  
 commonality  
 compression ratio  
 computer systems performance  
 cost incentives  
 cost reduction  
 costs  
 economic analysis  
 economic factors



## effluents

effectiveness  
 feasibility  
 figure of merit  
 human factors engineering  
 incentive techniques  
 indexes (ratios)  
 optimization  
 ∞ performance  
 productivity  
 ratios  
 utilization

### effluents

RT air pollution  
 contaminants  
 ∞ discharge  
 environment protection  
 exhaust gases  
 filtration  
 liquid wastes  
 reaction products  
 settling  
 sewage  
 sewers  
 volcanic eruptions  
 waste disposal  
 wastes

### efflux

RT emission  
 output

### effort

RT abilities  
 consistency  
 fatigue (biology)  
 ∞ performance  
 physical work

### effusives

GS **effusives**  
 . lava  
 RT cones (volcanoes)  
 igneous rocks  
 Mars volcanoes  
 rocks  
 volcanoes  
 volcanology

### EGCR (reactor)

USE **experimental gas cooled reactors**

### eggs

GS cells (biology)  
 . gametocytes  
 . . **eggs**  
 . . . zygotes  
 RT embryos  
 fetuses  
 ∞ food  
 ovaries

### EGO

UF *Eccentric Geophysical Observatory*  
*Eccentric Orbit Geophysical*  
*Observatory*  
 EGO  
 GS artificial satellites  
 . geophysical satellites  
 . . OGO  
 . . . **EGO**  
 observatories  
 . geophysical observatories  
 . . OGO  
 . . . **EGO**  
 RT Agena B rocket vehicle  
 Atlas launch vehicles  
 POGO

### egress

RT air locks  
 doors  
 hatches  
 ingress (spacecraft passageway)  
 openings  
 outlets

### Egypt

GS nations  
 . **Egypt**

RT Africa

### EH-101 helicopter

(added April 1997)  
 UF *Heliliner (helicopter)*  
*Merlin (helicopter)*  
 GS V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . **EH-101 helicopter**  
 RT ∞ aircraft  
 commercial aircraft  
 military helicopters

### EHW (computers)

(added September 2001)  
 USE **evolvable hardware**

### eigenfunctions

USE **eigenvectors**

### eigenstates

USE **eigenvectors**

### eigenvalues

UF *characteristic equations*  
*characteristic functions*  
 GS algebra  
 . vector spaces  
 . . matrices (mathematics)  
 . . . **eigenvalues**  
 RT eigenvectors  
 flux vector splitting  
 Hill determinant  
 Jacobi matrix method  
 Jordan form  
 polynomials  
 roots of equations

### eigenvectors

UF *characteristic equations*  
*characteristic functions*  
*eigenfunctions*  
*eigenstates*  
 GS algebra  
 . vector spaces  
 . . matrices (mathematics)  
 . . . **eigenvectors**  
 . . vectors (mathematics)  
 . . . **eigenvectors**  
 RT eigenvalues  
 Jacobi matrix method  
 Mathieu function  
 polynomials

### eikonal equation

GS wave equations  
 . **eikonal equation**  
 RT ∞ equations  
 geometrical optics  
 Pomeranchuk theorem  
 refracted waves  
 wave fronts  
 ∞ waves

### Einstein equations

GS analysis (mathematics)  
 . real variables  
 . . **Einstein equations**  
 RT Brownian movements  
 diffusion  
 diffusion theory  
 ∞ equations  
 equations of motion  
 grand unified theory  
 kinetic equations  
 probability theory

### Einstein Observatory

USE **HEAO 2**

### einsteinium

GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . **einsteinium**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements

. . . . **einsteinium**  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . **einsteinium**  
 RT einsteinium compounds

### einsteinium compounds

GS actinide series compounds  
 . **einsteinium compounds**  
 RT einsteinium

### EISCAT radar system (Europe)

DEF The European Incoherent Scatter Radar system. Used for European Incoherent Scatter Radar.

UF *European Incoherent Scatter Radar*  
 GS radar  
 . incoherent scatter radar  
 . . **EISCAT radar system (Europe)**

RT incoherent scattering  
 international cooperation  
 ionospheric propagation  
 radar scattering  
 radar transmission  
 ∞ systems  
 ultrahigh frequencies

### ejecta

DEF Matter ejected during impact cratering processes, usually meteoritic.

RT cratering  
 craters  
 debris  
 ejection  
 fragments  
 impact damage  
 Mars craters  
 meteorite craters  
 meteoritic damage  
 projectile cratering  
 Wolf-Rayet stars

### ejection

GS **ejection**  
 . stellar mass ejection  
 . . coronal mass ejection  
 RT bailout  
 ∞ discharge  
 disconnect devices  
 disposal  
 dumping  
 ejecta  
 ejectors  
 emission  
 emptying  
 escape (abandonment)  
 escape systems  
 evacuating (transportation)  
 evacuating (vacuum)  
 exhausting  
 expulsion  
 expulsion bladders  
 flushing  
 jettison systems  
 jettisoning  
 materials handling  
 parachute descent  
 releasing  
 removal  
 shedding  
 throwing  
 unloading

### ejection injuries

GS injuries  
 . **ejection injuries**  
 RT bailout  
 pilot training

### ejection seats

GS onboard equipment  
 . aircraft equipment  
 . . **ejection seats**  
 . . . flying ejection seats  
 safety devices  
 . **ejection seats**  
 . . flying ejection seats  
 seats  
 . **ejection seats**

. . flying ejection seats  
 RT abort apparatus  
 aircraft safety  
 bailout  
 cockpits  
 ejectors  
 escape capsules  
 escape systems  
 jettison systems  
 ∞ propellant actuated devices  
**ejection training**  
 GS education  
 . **ejection training**  
 RT astronaut training  
 bailout  
 escape (abandonment)  
 flight training  
 parachute descent  
 pilot training  
**ejectors**  
 DEF Devices consisting of a nozzle, mixing tube, and diffuser utilizing the kinetic energy of a fluid from a low pressure region by direct mixing and ejecting both streams.  
 RT dispensers  
 ejection  
 ejection seats  
 exhaust diffusers  
 exhaust nozzles  
 exhaust systems  
 flying ejection seats  
 injectors  
 jet engines  
 jet pumps  
 materials handling  
 pumps  
 rocket engines  
 sprayers  
 vacuum pumps  
**Ekman layer**  
 DEF The layer of transition between the surface boundary layer of the atmosphere, where the shearing stress is constant, and the free atmosphere, which is treated as an ideal fluid in approximate geostrophic equilibrium.  
 RT atmospheric boundary layer  
 boundary layer transition  
 ∞ layers  
 mixing layers (fluids)  
 porous boundary layer control  
 turbulent boundary layer  
*ekranoplanes*  
 (added December 1999)  
 USE **wing-in-ground effect vehicles**  
**el Nino**  
 DEF A warming of the surface waters of the eastern equatorial Pacific Ocean that occurs at irregular intervals of 1-2 years, usually lasting 1-2 years.  
 GS circulation  
 . water circulation  
 . . water currents  
 . . . ocean currents  
 . . . . **el Nino**  
 RT air water interactions  
 Madden-Julian Oscillation  
 ocean temperature  
 Pacific Ocean  
 periodic variations  
 quasi-biennial oscillation  
 Southern Oscillation  
 tropical meteorology  
**El Salvador**  
 GS nations  
 . **El Salvador**  
 RT Central America  
**Elara**  
 (added July 1995)  
 DEF A natural satellite of Jupiter, orbiting at a mean distance of 11,737,000 kilometers.  
 GS celestial bodies  
 . natural satellites  
 . . Jupiter satellites

. . . **Elara**  
 RT Jupiter (planet)  
**elastic anisotropy**  
 GS anisotropy  
 . plastic anisotropy  
 . . **elastic anisotropy**  
**elastic bars**  
 GS bars  
 . **elastic bars**  
**elastic bending**  
 GS bending  
 . **elastic bending**  
 deformation  
 . elastic deformation  
 . . **elastic bending**  
 RT earthquake resistant structures  
**elastic bodies**  
 RT ∞ bodies  
 ∞ elastic systems  
 elastodynamics  
 elastostatics  
 plastic bodies  
**elastic buckling**  
 GS buckling  
 . **elastic buckling**  
 deformation  
 . elastic deformation  
 . . **elastic buckling**  
 RT failure modes  
*elastic collisions*  
 USE **elastic scattering**  
*elastic constants*  
 USE **elastic properties**  
**elastic cylinders**  
 RT ∞ cylinders  
 cylindrical bodies  
 cylindrical shells  
**elastic damping**  
 GS damping  
 . **elastic damping**  
 . . viscoelastic damping  
 elastodynamics  
 . **elastic damping**  
 . . viscoelastic damping  
 RT resonance testing  
 vibration damping  
 viscous damping  
**elastic deformation**  
 GS deformation  
 . **elastic deformation**  
 . . elastic bending  
 . . elastic buckling  
 RT axial strain  
 bending  
 Bordoni peaks  
 deflection  
 elastodynamics  
 elastostatics  
 flexible spacecraft  
 plane strain  
 plastic deformation  
 prestressing  
 strain distribution  
 strain energy release rate  
 stress-strain relationships  
 stretching  
 structural strain  
 tensile deformation  
**elastic media**  
 GS media  
 . **elastic media**  
 RT elastodynamics  
 elastostatics  
*elastic modulus*  
 USE **modulus of elasticity**  
**elastic plates**  
 GS structural members  
 . plates (structural members)

. . **elastic plates**  
 RT plastic bodies  
 plastic plates  
**elastic properties**  
 DEF Properties of materials by virtue of which they tend to recover their original size and shape immediately after removal of the forces causing deformation. Used for elastic constants and elasticity.  
 UF *elastic constants*  
*elasticity*  
 GS mechanical properties  
 . **elastic properties**  
 . . aeroelasticity  
 . . . aeroservoelasticity  
 . . . aerothermoelasticity  
 . . anelasticity  
 . . elastoplasticity  
 . . hydroelasticity  
 . . hypoelasticity  
 . . magnetostriction  
 . . modulus of elasticity  
 . . . dynamic modulus of elasticity  
 . . photoelasticity  
 . . . photoviscoelasticity  
 . . proportional limit  
 . . thermoelasticity  
 . . . aerothermoelasticity  
 . . viscoelasticity  
 . . . photoviscoelasticity  
 . . . thermoviscoelasticity  
 . . ferroelasticity  
 RT Airy function  
 biharmonic equations  
 compressive strength  
 elastodynamics  
 elastometers  
 elastostatics  
 Euler-Bernoulli beams  
 flexibility  
 Hookes law  
 hybrid structures  
 influence coefficient  
 microsonics  
 microyield strength  
 ∞ physical properties  
 piezoelectricity  
 plastic properties  
 Poisson ratio  
 propellant properties  
 ∞ properties  
 resilience  
 softness  
 strain energy release rate  
 stress tensors  
 tensile properties  
 tensile strength  
 yield strength  
**elastic scattering**  
 UF *elastic collisions*  
 GS scattering  
 . **elastic scattering**  
 RT atomic collisions  
 ∞ coherence  
 coherent scattering  
 electron scattering  
 Glauber theory  
 inelastic scattering  
 nuclear scattering  
 photon-electron interaction  
 Pomeranchuk theorem  
**elastic sheets**  
 RT girder webs  
 ∞ sheets  
 webs (sheets)  
 webs (supports)  
**elastic shells**  
 GS shells (structural forms)  
 . **elastic shells**  
 RT anisotropic shells

## elastic systems

- plastic shells
- elastic stability*
- USE **damping**
- elastic strength*
- USE **proportional limit**
- ∞ **elastic systems**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT earthquake resistant structures
- elastic bodies
- ∞ systems
- elastic waves**
- UF *expansion waves*
- loading waves*
- pressure waves*
- rarefaction waves*
- GS **elastic waves**
- . capillary waves
- . . gravity waves
- . . . baroclinic waves
- . . ripples
- . coherent acoustic radiation
- . compression waves
- . dilatational waves
- . ionic waves
- . magnetoelastic waves
- . . magnetoacoustic waves
- . . magnetohydrodynamic waves
- . . plasma waves
- . . . electrostatic waves
- . P waves
- . phonons
- . . phonon beams
- . polarized elastic waves
- . S waves
- . . SH waves
- . seismic waves
- . . Love waves
- . . microseisms
- . . Rayleigh waves
- . shock waves
- . . detonation waves
- . . interplanetary shock waves
- . . Mach cones
- . . normal shock waves
- . . oblique shock waves
- . . Riemann waves
- . . sonic booms
- . sound waves
- . . electroacoustic waves
- . . ion acoustic waves
- . . Lamb waves
- . . noise (sound)
- . . . aircraft noise
- . . . . blade slap noise
- . . . . jet aircraft noise
- . . . . propeller noise
- . . . . sonic booms
- . . . engine noise
- . . . . rocket engine noise
- . . . flow noise
- . . . thermal noise
- . . . . aerodynamic noise
- . . . . blade slap noise
- . . . . propeller noise
- . . . . screech tones
- . stress waves
- . Tollmien-Schlichting waves
- . ultrasonic radiation
- . unloading waves
- RT acoustic propagation
- acoustic simulation
- acoustics
- aeolian tones
- background noise
- backward waves
- cnoidal waves
- coherent radiation
- combustion vibration
- continuous radiation
- cylindrical waves
- diffusion waves
- Doppler effect
- elastodynamics
- elastohydrodynamics
- Lame wave equations
- longitudinal waves
- magnetohydrodynamic stability
- plane waves
- polarized radiation
- pressure
- pulsed radiation
- ∞ radiation
- radiation distribution
- radiation pressure
- rarefaction
- reflected waves
- refracted waves
- sine waves
- solitary waves
- sound transmission
- spherical waves
- stress propagation
- surface waves
- transverse waves
- traveling waves
- tropospheric waves
- underwater acoustics
- vibration
- wave dispersion
- ∞ waves
- elasticity*
- USE **elastic properties**
- elasticizers*
- USE **plasticizers**
- elastin**
- GS biopolymers
- . proteins
- . . **elastin**
- organic compounds
- . proteins
- . . **elastin**
- RT albumins
- elastodynamics**
- GS **elastodynamics**
- . elastic damping
- . . viscoelastic damping
- . . . elastohydrodynamics
- RT ∞ dynamics
- elastic bodies
- elastic deformation
- elastic media
- elastic properties
- elastic waves
- elastostatics
- electrorheological fluids
- elastohydrodynamics**
- GS elastodynamics
- . **elastohydrodynamics**
- mechanics (physics)
- . fluid mechanics
- . . fluid dynamics
- . . . hydrodynamics
- . . . . **elastohydrodynamics**
- . . . hydromechanics
- . . . hydrodynamics
- . . . . **elastohydrodynamics**
- RT ball bearings
- elastic waves
- friction measurement
- lubrication
- rotating cylinders
- squeeze films
- water waves
- elastomers**
- DEF Macromolecular materials which, at room temperature, are capable of recovering substantially in size and shape after removal of a deforming force.
- GS **elastomers**
- . rubber
- . . synthetic rubbers
- . . . Adiprene (trademark)
- . . . Buna (trademark)
- . . . silicone rubber
- . . . . RTV-40 rubber (trademark)
- . . . . RTV-60 rubber (trademark)
- . . . Viton rubber (trademark)
- . . . vulcanized elastomers
- . . . . RTV-40 rubber (trademark)
- . . . . RTV-60 rubber (trademark)
- . . . chloroprene resins
- RT latex
- organic materials
- plastics
- ∞ polymers
- solithanes
- sponges (materials)
- thioplastics
- elastometers**
- GS measuring instruments
- . **elastometers**
- RT elastic properties
- extensometers
- strain gages
- elastoplasticity**
- GS mechanical properties
- . elastic properties
- . . **elastoplasticity**
- . plastic properties
- . . **elastoplasticity**
- RT J integral
- plastic bodies
- plastic plates
- plastic shells
- superplastic forming
- elastostatics**
- RT elastic bodies
- elastic deformation
- elastic media
- elastic properties
- elastodynamics
- statics
- Elber equation**
- DEF In fatigue crack propagation studies, the effective stress range ratio  $U = 0.5 + 0.4R$ , where R is the stress ratio.
- RT crack closure
- cracks
- cyclic loads
- ∞ equations
- fractography
- fracture mechanics
- microcracks
- stress concentration
- stress cycles
- elbow (anatomy)**
- GS anatomy
- . limbs (anatomy)
- . . arm (anatomy)
- . . . **elbow (anatomy)**
- . . . . musculoskeletal system
- . . . . joints (anatomy)
- . . . . **elbow (anatomy)**
- appendages
- . arm (anatomy)
- . . **elbow (anatomy)**
- RT humerus
- ulna
- Eldo launch vehicle**
- GS launch vehicles
- . **Eldo launch vehicle**
- rocket vehicles
- . multistage rocket vehicles
- . . **Eldo launch vehicle**
- RT Ariane launch vehicle
- Blue Streak launch vehicle
- Europa launch vehicles
- European 1 spacecraft
- European Space Agency
- Electra aircraft**
- GS commercial aircraft
- . **Electra aircraft**
- jet aircraft
- . turboprop aircraft
- . . **Electra aircraft**
- Lockheed aircraft
- . **Electra aircraft**
- monoplanes
- . **Electra aircraft**
- passenger aircraft
- . **Electra aircraft**

transport aircraft  
 . **Electra aircraft**  
 RT ∞ aircraft

**electrets**  
 RT capacitors  
 Curie temperature  
 dielectric polarization  
 dielectrics  
 electric energy storage  
 electric fields  
 energy storage  
 magnets  
 polarization (charge separation)

*electric aircraft*  
 USE **fly by wire control**

*electric appliances*  
 USE **electric equipment**

**electric arcs**  
 DEF (1) a luminous discharge of electricity through a gas. (2) A prolonged electrical discharge or series of prolonged discharges between two electrodes with no physical contact between them.  
 GS electric current  
 . electric discharges  
 . . **electric arcs**  
 . . . carbon arcs  
 . . . mercury arcs  
 RT arc chambers  
 arc discharges  
 arc generators  
 ∞ arcs  
 coronas  
 electrical faults  
 flashover  
 gas discharges  
 glow discharges  
 ionization  
 light sources  
 lightning  
 magnetohydrodynamics  
 planotrons  
 plasma generators  
 plasmas (physics)  
 Saha equations  
 short circuits

**electric automobiles**  
 GS surface vehicles  
 . motor vehicles  
 . . automobiles  
 . . . **electric automobiles**  
 . . electric motor vehicles  
 . . . **electric automobiles**  
 RT transportation

**electric batteries**  
 SN (INCLUDES BOTH RECHARGEABLE OR STORAGE BATTERIES AND NON-RECHARGEABLE BATTERIES FOR GENERATING CURRENT FROM A STORED CHEMICAL ENERGY SOURCE)  
 UF *batteries*  
 GS electrochemical cells  
 . **electric batteries**  
 . . nickel iron batteries  
 . . primary batteries  
 . . . alkaline batteries  
 . . . dry cells  
 . . . . magnesium cells  
 . . . . nickel zinc batteries  
 . . . metal air batteries  
 . . . . zinc-oxygen batteries  
 . . . sodium sulfur batteries  
 . . thermal batteries  
 . . Redox cells  
 . . storage batteries  
 . . lead acid batteries  
 . . nickel cadmium batteries  
 . . . nickel hydrogen batteries  
 . . . nickel zinc batteries  
 . . . silver cadmium batteries  
 . . . silver hydrogen batteries  
 . . . silver zinc batteries  
 . . . zinc-bromide batteries  
 . . . zinc-chlorine batteries  
 . . lithium batteries

. . wet cells  
 . . . lithium sulfur batteries  
 RT auxiliary power sources  
 battery chargers  
 charge efficiency  
 chemical auxiliary power units  
 direct power generators  
 ∞ electric cells  
 ∞ electric power  
 electrodes  
 electrolytes  
 electrolytic cells  
 electromotive forces  
 ∞ energy sources  
 energy storage  
 nonaqueous electrolytes  
 ∞ power supplies  
 pulse charging  
 radioisotope batteries  
 roadway powered vehicles  
 space station power supplies  
 spacecraft power supplies  
 voltage converters (DC to DC)

**electric bridges**  
 GS circuits  
 . **electric bridges**  
 . . wire bridge circuits  
 . . . Wheatstone bridges  
 RT ∞ bridges  
 capacitors  
 electrical measurement  
 measuring instruments  
 solid state devices

∞ **electric cells**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT amplifiers  
 direct power generators  
 electric batteries  
 electric generators  
 electrochemical cells  
 electrolytic cells  
 fission electric cells  
 fuel cells  
 Kerr cells  
 lead acid batteries  
 lithium sulfur batteries  
 nonaqueous electrolytes  
 photoelectric cells  
 sodium sulfur batteries  
 solar cells  
 wet cells

**electric charge**  
 GS **electric charge**  
 . electric dipoles  
 . . orbiting dipoles  
 . electrostatic charge  
 . ion charge  
 . space charge  
 . traveling charge  
 RT capacitance  
 ∞ charging  
 ∞ dipoles  
 electrical properties  
 electrometers  
 polarity  
 polarization (charge separation)  
 pulse charging  
 SCATHA satellite

**electric choppers**  
 SN (DEVICES FOR CONVERTING DC TO AC)  
 UF *choppers (electric)*  
 RT amplifiers  
 mechanical oscillators

*electric circuits*  
 USE **circuits**

**electric coils**  
 GS **electric coils**  
 . magnetic coils  
 . . field coils  
 . . magnet coils  
 RT chokes  
 ∞ coils  
 ignition systems

impedance  
 magnetic cores  
 transformers

**electric conductors**  
 UF *electrical leads*  
 GS conductors  
 . **electric conductors**  
 . . beam leads  
 . . conducting polymers  
 . . electric wire  
 RT ∞ conduction  
 dielectrics  
 eddy currents  
 electrical insulation  
 electrical resistivity  
 electrostatic shielding  
 insulators  
 resistors  
 semiconductors (materials)  
 Sommerfeld waves  
 thermal conductors  
 transmission lines

**electric connectors**  
 DEF Connecting devices, ordinarily designed for use in a fixed location to which a wire or wires of a circuit may be attached and that are arranged for the insertion of a plug. Used for jacks (electrical).  
 UF *connectors (electric)*  
*jacks (electrical)*  
 GS connectors  
 . **electric connectors**  
 RT beam leads  
 circuits  
 disconnect devices  
 electric terminals  
 flat conductors  
 ∞ jacks  
 optical interconnects  
 switches

**electric contacts**  
 UF *contacts (electric)*  
 RT brushes  
 brushes (electrical contacts)  
 commutators  
 contact potentials  
 contact resistance  
 dropouts  
 flat conductors  
 ∞ relay  
 ∞ sliding contact  
 sliding friction  
 switches

**electric control**  
 UF *electrohydraulic control*  
 RT automatic control  
 ∞ control  
 control equipment  
 control systems design  
 electronic control  
 engine control  
 numerical control  
 optical control  
 remote control  
 solenoid valves  
 voltage controlled oscillators

**electric corona**  
 DEF A luminous, and often audible, electric discharge that is intermediate in nature between a spark discharge (with, usually, its single discharge channel) and a non point discharge (with its diffuse, quiescent, nonluminous character). Used for corona discharges.  
 UF *corona discharges*  
 GS coronas  
 . **electric corona**  
 electric current  
 . electric discharges  
 . . **electric corona**  
 RT atmospheric electricity  
 electrohydrodynamics  
 glow discharges  
 ionization  
 solar corona

# electric current

static electricity

## electric current

- UF *amperage*
- electroseismic effect*
- Hall currents*
- photocurrents*
- GS **electric current**
  - . alternating current
  - . beam currents
  - . Brillouin flow
  - . direct current
  - . eddy currents
  - . electric discharges
    - . . . arc discharges
    - . . . electric arcs
      - . . . . carbon arcs
      - . . . . mercury arcs
    - . . . electric corona
    - . . . electric sparks
    - . . . electrodeless discharges
    - . . . flashover
    - . . . glow discharges
    - . . . lightning
      - . . . . ball lightning
      - . . . . cloud-to-cloud discharges
      - . . . . cloud-to-ground discharges
      - . . . . intracloud discharges
      - . . . . leaders (meteorology)
        - . . . . . stepped leaders
      - . . . . multipactor discharges
      - . . . . Penning discharge
      - . . . . radio frequency discharge
      - . . . . Saint Elmo fire
      - . . . . Townsend discharge
        - . . . . . gas discharges
        - . . . . . toroidal discharge
        - . . . . . ring discharge
    - . . . external surface currents
    - . . . field aligned currents
    - . . . Birkeland currents
    - . . . high current
    - . . . ionospheric currents
    - . . . Birkeland currents
    - . . . electrojets
      - . . . . auroral electrojets
      - . . . . equatorial electrojet
    - . . . Pedersen currents
    - . . . critical current
    - . . . dark current
    - . . . line current
    - . . . low currents
    - . . . plasma currents
    - . . . ring currents
    - . . . short circuit currents
    - . . . telluric currents
    - . . . threshold currents
  - RT ammeters
  - circuits
  - current converters (AC to DC)
  - current density
  - current regulators
  - current sheets
  - ∞ currents
  - ∞ electric power
  - electrical resistivity
  - electricity
  - high voltages
  - hydroelectricity
  - inverted converters (DC to AC)
  - Kirchhoff law of networks
  - levitation melting
  - Lienard potential
  - low conductivity
  - micromilliammeters
  - Ohms law
  - power conditioning
  - system generated electromagnetic pulses
  - transmission lines
  - volt-ampere characteristics

## electric dipoles

- GS electric charge
- . **electric dipoles**
  - . . . orbiting dipoles
- RT ∞ dipoles
- magnetic dipoles

zwitterions

## electric discharges

- DEF The flowing of electricity through a gas, resulting in the emission of radiation that is characteristic of the gas and the intensity of the current.
- GS electric current
- . **electric discharges**
  - . . . arc discharges
  - . . . electric arcs
    - . . . . carbon arcs
    - . . . . mercury arcs
    - . . . . electric corona
    - . . . . electric sparks
    - . . . . electrodeless discharges
    - . . . . flashover
    - . . . . glow discharges
    - . . . . lightning
      - . . . . . ball lightning
      - . . . . . cloud-to-cloud discharges
      - . . . . . cloud-to-ground discharges
      - . . . . . intracloud discharges
      - . . . . . leaders (meteorology)
        - . . . . . . stepped leaders
      - . . . . . multipactor discharges
      - . . . . . Penning discharge
      - . . . . . radio frequency discharge
      - . . . . . Saint Elmo fire
      - . . . . . Townsend discharge
      - . . . . . gas discharges
      - . . . . . toroidal discharge
      - . . . . . . ring discharge
    - . . . . . avalanches
    - . . . . . coronas
  - ∞ discharge
  - duoplasmatrons
  - electron emission
  - electrostatic charge
  - ∞ flash
    - ionization
    - lightning suppression
    - Molniya satellites
    - plasma currents
    - space charge
    - Zener effect
- RT

## electric energy storage

- GS energy storage
- . **electric energy storage**
- RT capacitors
- direct power generators
- electrets
- electrochemical capacitors
- inductors
- potential energy

## ∞ electric equipment

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *electric appliances*
- RT airborne equipment
- circuits
- current regulators
- electric generators
- electric power transmission
- electricity
- electromechanical devices
- electronic equipment
- heating equipment
- homopolar generators
- lighting equipment
- logistics
- miniature electronic equipment
- motors
- solenoid valves
- utilities
- voltage converters (AC to AC)
- voltage converters (DC to DC)
- welding machines

## electric equipment tests

- SN (CHECKOUT OF ELECTRICAL EQUIPMENT)
- RT electrical measurement
- electronic equipment tests
- ground tests

∞ tests

## electric field strength

- GS field strength
- . **electric field strength**
- RT Coulomb potential
- ∞ force
- H waves
- ∞ strength

## electric fields

- UF *electrostatic fields*
- RT barium ion clouds
- cavitons
- constitutive equations
- Coulomb potential
- crossed fields
- crystal field theory
- dielectric polarization
- electrets
- electrodynamics
- electromagnetism
- electromechanics
- electrostatic charge
- electrostatics
- external surface currents
- field emission
- field strength
- ∞ fields
- Lienard potential
- magnetic fields
- Pedersen currents
- permittivity
- polarity
- spacecraft charging
- spark gaps
- Stark effect
- static electricity

## electric filters

- GS electromagnetic wave filters
- . **electric filters**
  - . . . bandstop filters
  - . . . crystal filters
  - . . . digital filters
  - . . . FIR filters
  - . . . IIR filters
  - . . . microwave filters
  - . . . radar filters
  - . . . radio filters
  - . . . tracking filters
  - . . . waveguide filters
- RT adaptive filters
- bandpass filters
- capacitors
- circuits
- electronic filters
- ∞ filters
- high pass filters
- infrared filters
- Kalman filters
- linear filters
- low pass filters
- nonlinear filters
- optical filters
- RC circuits
- receivers
- reduced order filters
- resistors
- transformers
- tunable filters
- ultraviolet filters
- Wiener filtering

## electric furnaces

- DEF Furnaces whose heat is derived from electrical energy, generally achieved through resistance heating. Materials research and space processing are research uses.
- GS heating equipment
- . furnaces
- . . **electric furnaces**
- RT ∞ materials
- space processing

## electric fuses

- RT circuit protection
- disconnect devices

- ∞ fuses
- electric generators**
  - UF *electric power conversion*
  - electrogenerators*
  - power generators*
  - GS **electric generators**
    - . AC generators
      - . . linear alternators
      - . . static alternators
    - . direct power generators
      - . . DC generators
        - . . . homopolar generators
        - . . electrostatic generators
        - . . fuel cells
          - . . . biochemical fuel cells
          - . . . hydrogen oxygen fuel cells
          - . . . molten carbonate fuel cells
          - . . . phosphoric acid fuel cells
          - . . . regenerative fuel cells
          - . . . solid oxide fuel cells
        - . . magnetohydrodynamic generators
        - . . photoelectric generators
          - . . . photovoltaic cells
            - . . . . solar cells
            - . . . . vertical junction solar cells
        - . . primary batteries
          - . . . alkaline batteries
          - . . . dry cells
            - . . . . magnesium cells
              - . . . . . nickel zinc batteries
            - . . . . metal air batteries
              - . . . . . zinc-oxygen batteries
              - . . . . . sodium sulfur batteries
            - . . . . thermal batteries
            - . . . . radioisotope batteries
              - . . . . . SNAP 7
              - . . . . . SNAP 9A
              - . . . . . SNAP 11
              - . . . . . SNAP 13
              - . . . . . SNAP 15
              - . . . . . SNAP 17
              - . . . . . SNAP 19
              - . . . . . SNAP 21
              - . . . . . SNAP 23
              - . . . . . SNAP 27
              - . . . . . SNAP 29
          - . . thermionic converters
            - . . . SNAP 13
            - . . . solar blankets
          - . . thermoelectric generators
            - . . . SNAP 3
            - . . . SNAP 7
            - . . . SNAP 9A
            - . . . SNAP 10A
            - . . . SNAP 11
            - . . . SNAP 15
            - . . . SNAP 17
            - . . . SNAP 19
            - . . . SNAP 21
            - . . . SNAP 23
            - . . . SNAP 27
            - . . . SNAP 29
          - . . . solar sea power plants
        - . rotating generators
          - . . amplidynes
          - . . dynamometers
          - . . homopolar generators
          - . . turbogenerators
            - . . . ASTEC solar turboelectric generator
          - . . solar generators
            - . . . solar auxiliary power units
            - . . . ASTEC solar turboelectric generator
          - . . solar cells
            - . . . vertical junction solar cells
            - . . solar dynamic power systems
        - RT aircraft power supplies
        - arc generators
        - armatures
        - auxiliary power sources
        - brushes
        - brushes (electrical contacts)
        - closed cycles
        - cogeneration
        - combined cycle power generation
        - ∞ conversion
        - ∞ converters
        - ∞ electric cells
        - ∞ electric equipment
          - electrical engineering
          - electromotive forces
        - ∞ energy sources
        - ∞ generators
          - nuclear electric power generation
        - ∞ power
          - power conditioning
        - ∞ power supplies
          - SNAP
          - solar ponds (heat storage)
          - static inverters
          - thermonuclear power generation
          - tide powered generators
          - windmills (windpowered machines)
          - windpowered generators
        - electric hybrid vehicles**
          - DEF Surface vehicles which utilize propulsion systems of both electric motors and conventional internal combustion engines.
          - GS surface vehicles
            - . **electric hybrid vehicles**
          - RT automobiles
            - internal combustion engines
          - ∞ rotating electrical machines
          - ∞ vehicles
        - electric ignition**
          - GS ignition
            - . **electric ignition**
          - RT igniters
            - ignition systems
            - spark ignition
            - squibs
            - starting
        - electric impulses*
        - USE **electric pulses**
        - electric moments**
          - GS electrical properties
            - . **electric moments**
            - moments
              - . dipole moments
              - . . **electric moments**
          - RT magnetic moments
          - polarization (charge separation)
        - electric motor vehicles**
          - GS surface vehicles
            - . motor vehicles
              - . . **electric motor vehicles**
              - . . . electric automobiles
          - RT automated transit vehicles
            - automobiles
            - crawler tractors
            - research vehicles
            - roadway powered vehicles
            - test vehicles
            - tractors
            - trucks
          - ∞ vehicles
        - electric motors**
          - GS electromechanical devices
            - . **electric motors**
            - . . asynchronous motors
            - . . induction motors
            - . . micromotors
            - . . piezoelectric motors
            - . . stepping motors
            - . . synchronous motors
            - . . torque motors
          - motors
            - . **electric motors**
            - . . asynchronous motors
            - . . induction motors
            - . . micromotors
            - . . piezoelectric motors
            - . . stepping motors
            - . . synchronous motors
            - . . torque motors
          - RT amplidynes
          - armatures
          - brushes
          - brushes (electrical contacts)
          - circuits
          - commutators
        - decommutators
        - power factor controllers
        - ∞ rotating electrical machines
          - servomechanisms
          - servomotors
          - stators
          - transformers
        - electric networks**
          - GS networks
            - . **electric networks**
          - RT impedance matching
          - sneak circuit analysis
          - voltage controlled oscillators
        - electric outlets**
          - RT ∞ power transmission
        - electric potential**
          - DEF In electrostatics, the work done in moving unit positive charge from infinity to the point whose potential is being specified. Used for voltage.
          - UF *voltage*
          - GS potential energy
            - . **electric potential**
            - . . bioelectric potential
            - . . contact potentials
            - . . Coulomb potential
            - . . high voltages
            - . . Lienard potential
            - . . low voltage
            - . . open circuit voltage
            - . . photovoltages
            - . . quantum wells
            - . . . photoexcitation
            - . . spike potentials
            - . . threshold voltage
          - RT Barritt diodes
            - bias
            - capacitance-voltage characteristics
            - electromotive forces
            - Gibbs-Helmholtz equations
            - ionization potentials
            - Kirchhoff law of networks
            - overvoltage
            - ∞ potential
            - potentiometers (instruments)
            - power conditioning
            - static electricity
            - transconductance
            - volt-ampere characteristics
        - ∞ **electric power**
          - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
          - UF *electrical energy*
          - RT auxiliary power sources
            - electric batteries
            - electric current
            - electric power plants
            - electric propulsion
            - electrical properties
            - electricity
            - electrification
            - geothermal energy utilization
            - hydroelectricity
            - induction motors
            - Poynting theorem
            - tokamak devices
            - turbogenerators
            - utilities
            - voltage converters (AC to AC)
            - voltage converters (DC to DC)
        - electric power conversion*
        - USE **electric generators**
        - electric power plants**
          - GS **electric power plants**
            - . fuel cell power plants
            - . nuclear power plants
              - . . Enrico Fermi atomic power plant
              - . . Hallam Nuclear Power Facility
              - . . ML-1 nuclear power plant
            - . solar thermal electric power plants
          - RT cogeneration
            - combined cycle power generation
          - ∞ electric power
            - electrical engineering

## electric power supplies

- ∞ facilities
- flue gases
- fly ash
- hydroelectric power stations
- integrated energy systems
- Modular Integrated Utility System
- ∞ power plants
- solar sea power plants

### electric power supplies

- GS **electric power supplies**
  - . aircraft power supplies
  - . solar dynamic power systems
  - . space station power supplies
  - . spacecraft power supplies
- RT auxiliary power sources
- compulsators
- induction motors
- line current
- payload delivery (STS)
- ∞ power supplies

### electric power transmission

- GS transmission
  - . **electric power transmission**
- RT circuit protection
- circuits
- ∞ conduction
- ∞ electric equipment
- electrical engineering
- electrification
- hydroelectric power stations
- poles (supports)
- power lines
- ∞ power transmission
- superconducting power transmission
- transmission circuits
- transmission lines
- transmission loss
- underground transmission lines

### electric propulsion

- SN (EXCLUDES PROPULSION USING ELECTRIC MOTORS AS PRIME MOVERS)
- DEF A general term encompassing all the various types of propulsion in which the propellant consists of charged electrical particles which are accelerated by electrical or magnetic fields, or both; for example, electrostatic propulsion, electromagnetic propulsion, and electrothermal propulsion.
- GS propulsion
  - . **electric propulsion**
  - . . electromagnetic propulsion
  - . . . magnetic sails
  - . . electrostatic propulsion
  - . . . ion propulsion
  - . . laser propulsion
  - . . plasma propulsion
  - . . solar electric propulsion
- RT arc jet engines
- ∞ electric power
- Hall thrusters
- low thrust propulsion
- marine propulsion
- nuclear electric propulsion
- plasma power sources
- RIFT (reactor in flight test)
- SERT 1 spacecraft
- SERT 2 spacecraft
- space station propulsion
- spacecraft propulsion
- two stage plasma engines
- underwater propulsion

### electric pulses

- UF *electric impulses*
- GS pulses
  - . **electric pulses**
- RT electromagnetic missiles
- electromagnetic pulses
- pulse amplitude
- pulse duration
- pulse generators
- pulse modulation
- pulse rate
- ∞ signals

system generated electromagnetic pulses

### electric reactors

- GS **electric reactors**
  - . saturable reactors
- RT capacitors
- circuit protection
- ∞ reactors
- resistors
- transformers

### electric relays

- SN (EXCLUDES COMMUNICATION SYSTEM REPEATERS)
- GS switches
  - . **electric relays**
- RT armatures
- circuit breakers
- disconnect devices
- interruption
- ∞ relay
- selectors
- solenoid valves
- solenoids
- switching circuits
- time lag

### electric rocket engines

- GS engines
  - . rocket engines
  - . . **electric rocket engines**
  - . . . electrostatic engines
  - . . . . ion engines
  - . . . . . cesium engines
  - . . . . . Hall thrusters
  - . . . . . mercury ion engines
  - . . . . . RIT engines
  - . . . electrothermal engines
  - . . . . arc jet engines
  - . . . . . pulsed jet engines
  - . . . . . resistojet engines
  - . . . plasma engines
  - . . . . magnetoplasmadynamic thrusters
  - . . . . . pulsed inductive thrusters
  - . . . . . pulsed plasma thrusters
  - . . . . . two stage plasma engines
  - . . . . . VASIMR (propulsion system)
- RT magnetic nozzles
- microrocket engines
- restartable rocket engines
- SERT 1 spacecraft
- SERT 2 spacecraft
- space electric rocket tests
- sustainer rocket engines
- Vernier engines

### electric sparks

- UF *spark discharges*
- GS electric current
  - . electric discharges
  - . . **electric sparks**
  - sparks
  - . **electric sparks**
- RT flashover
- gas discharges
- ionization
- lightning
- spark chambers
- spark gaps
- spark ignition
- spark plugs
- static electricity

### electric stimuli

- RT ∞ stimuli

### electric switches

- GS switches
  - . **electric switches**
  - . . cryotrons
  - . . stepping switches
  - . . thermostats
  - . . vacuum arc switches
- RT contactors
- cryostats
- current regulators
- dropouts
- electronic control

pressure switches

solenoid valves

switching circuits

voltage regulators

### electric terminals

- RT electric connectors
- network analysis
- ∞ terminals

### electric welding

- GS welding
  - . fusion welding
  - . . **electric welding**
  - . . . arc welding
  - . . . . gas tungsten arc welding
  - . . . . plasma arc welding
  - . . . . . electroslog welding
  - . . . . . flash welding
- RT electron beam welding
- pressure welding
- spot welds
- welding machines

### electric wire

- UF *electric wiring*
- GS conductors
  - . electric conductors
  - . . **electric wire**
  - wire
  - . **electric wire**
- RT bus conductors
- circuits
- communication cables
- electrical insulation
- exploding wires
- flat conductors
- power lines
- transmission lines
- wire bridge circuits

### electric wiring

- USE **electric wire wiring**

### electrical breakdown

- USE **electrical faults**

### electrical conductivity

- USE **electrical resistivity**

### electrical conductivity meters

- GS measuring instruments
  - . conductivity meters
  - . . **electrical conductivity meters**
- RT ohmmeters

### electrical energy

- USE **electric power**

### electrical engineering

DEF Branch of engineering related to the design, development, and operation of electrical devices and systems.

- RT electric generators
- electric power plants
- electric power transmission
- ∞ electronics
- ∞ engineering
- ∞ power transmission
- systems engineering
- transmission lines
- turbogenerators

### electrical faults

- UF *electrical breakdown*
- voltage breakdown*
- GS **electrical faults**
  - . short circuits
- RT ∞ breakdown
- circuit protection
- electric arcs
- failure
- ∞ faults
- flashover
- sneak circuit analysis
- spark gaps

### electrical grounding

- RT circuit protection
- circuits

noise reduction  
transformers

**electrical impedance**

UF *admittance*  
*impittance*  
GS electrical properties  
  . **electrical impedance**  
  . . . electrical resistance  
  . . . . contact resistance  
  . . . . Hall resistance  
  . . . . skin resistance  
  . . . transconductance  
  . . reactance  
  impedance  
  . **electrical impedance**  
  . . . electrical resistance  
  . . . . contact resistance  
  . . . . Hall resistance  
  . . . . skin resistance  
  . . . transconductance  
  . . reactance  
RT capacitance  
impedance matching  
impedance measurement  
inductance  
latch-up  
ohmmeters  
Smith chart

**electrical insulation**

DEF A material of relatively low electrical conductivity and high dielectric strength, usually used to support or provide electrical separation for conductors, in which a voltage applied between two points on or within the material produces a small and sometimes negligible current.  
UF *nonconductors*  
GS insulation  
  . **electrical insulation**  
RT asbestos  
circuit protection  
dielectrics  
electric conductors  
electric wire  
excitons  
∞ insulated structures  
  insulators  
  wiring

*electrical leads*

USE **electric conductors**

**electrical measurement**

SN (MEASUREMENT OF ELECTRICAL PROPERTIES, QUANTITIES, OR CONDITIONS)  
UF *voltage measurement*  
GS **electrical measurement**  
  . coulometry  
  . polarography  
RT ammeters  
bolometers  
coulometers  
electric bridges  
electric equipment tests  
electromagnetic measurement  
electrometers  
electronic equipment tests  
flowmeters  
impedance measurement  
magnetometers  
∞ measurement  
  measuring instruments  
  micromilliammeters  
  mismatch (electrical)  
  ohmmeters  
  oscillographs  
  potentiometers (instruments)  
  wattmeters

**electrical properties**

UF *Bardeen approximation*  
GS **electrical properties**  
  . antiferroelectricity  
  . capacitance  
  . capacitance-voltage characteristics  
  . carrier mobility  
  . . . electron mobility  
  . . . hole mobility

. . charge distribution  
. . dielectric properties  
. . . dielectric loss  
. . . permittivity  
. . electric moments  
. . electrical impedance  
. . . electrical resistance  
. . . . contact resistance  
. . . . Hall resistance  
. . . . skin resistance  
. . . transconductance  
. . reactance  
. . electrical resistivity  
. . ionospheric conductivity  
. . magneto-resistivity  
. . photoconductivity  
. . plasma conductivity  
. . superconductivity  
. . . Kondo effect  
. . electrostriction  
. . ferroelectricity  
. . inductance  
. . proximity effect (electricity)  
. . photovoltaic effect  
. . piezoelectricity  
. . pyroelectricity

RT ∞ conductivity  
crystal oscillators  
diamagnetism  
dipole moments  
domains  
eddy currents  
electric charge  
∞ electric power  
∞ electricity  
electromagnetic properties  
field strength  
hysteresis  
impedance  
magnetic properties  
open circuit voltage  
optical properties  
photoelectric emission  
photoelectricity  
∞ physical properties  
∞ properties  
  quality control  
∞ resistance  
∞ solid state physics  
  standing wave ratios

**electrical resistance**

GS electrical properties  
  . electrical impedance  
  . . **electrical resistance**  
  . . . contact resistance  
  . . . Hall resistance  
  . . . skin resistance  
  . . . transconductance  
  impedance  
  . electrical impedance  
  . . **electrical resistance**  
  . . . contact resistance  
  . . . Hall resistance  
  . . . skin resistance  
  . . . transconductance  
RT galvanic skin response  
∞ high resistance  
  linear circuits  
∞ low resistance  
  Manganin (trademark)  
  ohmmeters  
  Ohms law  
  RC circuits  
  reactance  
∞ resistance  
  RL circuits  
  RLC circuits

**electrical resistivity**

DEF A factor such that the conduction-current density is equal to the electric field in the material divided by resistivity.  
UF *electrical conductivity*  
*electroconductivity*  
*resistivity*  
GS electrical properties  
  . **electrical resistivity**  
  . . ionospheric conductivity

. . magneto-resistivity  
. . photoconductivity  
. . plasma conductivity  
. . superconductivity  
. . . Kondo effect  
transport properties  
  . **electrical resistivity**  
  . . ionospheric conductivity  
  . . magneto-resistivity  
  . . photoconductivity  
  . . plasma conductivity  
  . . superconductivity  
  . . . Kondo effect  
RT air conductivity  
atmospheric conductivity  
carrier mobility  
∞ conductivity  
  electric conductors  
  electric current  
  electromigration  
  Hall resistance  
  high temperature superconductors  
  low conductivity  
  open circuit voltage  
  plasma currents  
∞ resistance

*electrically suspended gyroscopes*  
USE **electrostatic gyroscopes**

**electricity**

GS **electricity**  
  . alternating current  
  . atmospheric electricity  
  . . ionospheric currents  
  . . . Birkeland currents  
  . . . electrojets  
  . . . . auroral electrojets  
  . . . . equatorial electrojet  
  . . . Pedersen currents  
  . geoelectricity  
  . telluric currents  
  . hydroelectricity  
  . static electricity  
RT electric current  
∞ electric equipment  
∞ electric power  
  electrical properties  
  electromagnetism  
∞ electronics  
  lightning  
  Maxwell equation  
  Ohms law  
  photoelectricity  
  piezoelectricity  
  proximity effect (electricity)

**electrification**

RT ∞ electric power  
  electric power transmission  
∞ power transmission  
  transmission lines

**electroacoustic transducers**

DEF Transducers for receiving waves from an electric system and delivering waves to an acoustic system, or vice versa. Microphones and earphones are electroacoustic transducers.  
GS transducers  
  . sound transducers  
  . . **electroacoustic transducers**  
  . . . hydrophones  
  . . . loudspeakers  
  . . . microphones  
RT electroacoustics  
interdigital transducers  
surface acoustic wave devices

**electroacoustic waves**

GS elastic waves  
  . sound waves  
  . . **electroacoustic waves**  
RT electroacoustics  
electromagnetic radiation  
plasma waves  
pressure sensors  
wave interaction



∞ waves

**electroacoustics**

- GS acoustics
- . **electroacoustics**
- RT electroacoustic transducers
- electroacoustic waves
- sound transducers
- surface acoustic wave devices
- ultrasonic wave transducers
- ultrasonics

**electroactive polymers**

- (added June 2000)
- UF EAP (polymers)
- RT actuators
- conducting polymers
- electromechanical devices
- electrorheological fluids
- electrostriction
- microelectromechanical systems
- ∞ polymers
- robot arms

**electroanesthesia**

- GS anesthesia
- . **electroanesthesia**
- RT electronarcosis

*electrocardiograms*

USE **electrocardiography**

**electrocardiography**

- UF *electrocardiograms*
- GS bioengineering
- . biometrics
- . . . cardiology
- . . . **electrocardiography**
- RT ballistocardiography
- body measurement (biology)
- electrophysiology
- heart diseases
- medical electronics
- muscles
- phonocardiography
- vectorcardiography

**electrocatalysts**

- UF *fuel cell catalysts*
- GS catalysts
- . **electrocatalysts**
- RT fuel cells

**electrochemical capacitors**

- (added September 2003)
- DEF Devices that store energy in the electric field of an electrochemical double-layer.
- UF *double-layer capacitors*
- supercapacitors*
- ultracapacitors*
- GS capacitors
- . **electrochemical capacitors**
- RT electric energy storage

**electrochemical cells**

- DEF Electrochemical systems consisting of an anode and a cathode in metallic contact and immersed in an electrolyte. (The anode and cathode may be different metals or dissimilar areas on the same metal surface).
- GS **electrochemical cells**
- . electric batteries
- . . . nickel iron batteries
- . . . primary batteries
- . . . alkaline batteries
- . . . dry cells
- . . . . magnesium cells
- . . . . nickel zinc batteries
- . . . . metal air batteries
- . . . . zinc-oxygen batteries
- . . . sodium sulfur batteries
- . . . thermal batteries
- . . Redox cells
- . . storage batteries
- . . . lead acid batteries
- . . . . nickel cadmium batteries
- . . . . nickel hydrogen batteries
- . . . . nickel zinc batteries
- . . . . silver cadmium batteries
- . . . . silver hydrogen batteries

- . . . silver zinc batteries
- . . . zinc-bromide batteries
- . . . zinc-chlorine batteries
- . . lithium batteries
- . . wet cells
- . . . lithium sulfur batteries
- . . fuel cells
- . . biochemical fuel cells
- . . hydrogen oxygen fuel cells
- . . molten carbonate fuel cells
- . . phosphoric acid fuel cells
- . . regenerative fuel cells
- . . solid oxide fuel cells

- RT ∞ cells
- ∞ electric cells
- electrochemistry
- photoelectric cells
- photoelectrochemical devices
- photovoltaic cells

**electrochemical corrosion**

- GS corrosion
- . **electrochemical corrosion**
- RT electrodisolution
- electrolysis
- metal-water reactions

**electrochemical machining**

- UF *electrolytic grinding*
- GS machining
- . chemical machining
- . . **electrochemical machining**
- RT electropolishing

**electrochemical oxidation**

- GS chemical reactions
- . oxidation
- . . **electrochemical oxidation**

**electrochemical synthesis**

- (added January 2000)
- DEF A chemical synthesis reaction that is induced by an electric current.
- UF *electrosynthesis*
- GS synthesis (chemistry)
- . **electrochemical synthesis**
- RT electrochemistry
- electrolysis
- polymerization

**electrochemistry**

- DEF The branch of science and technology which deals with transformations between chemical and electrical energy.
- GS **electrochemistry**
- . electrolysis
- . . coulometry
- . photoelectrochemistry
- RT ∞ chemistry
- corrosion
- coulometers
- electrochemical cells
- electrochemical synthesis
- electrochromism
- electrodeposition
- electrodes
- electrodisolution
- electrolytes
- electrolytic cells
- electrophysics
- fuel cells
- glass electrodes
- nonaqueous electrolytes
- oxidation-reduction reactions
- Redox cells

**electrochromism**

- DEF A phenomenon whereby a select number of solid materials will change color when an electric field is applied.
- RT chromophores
- color
- display devices
- electrochemistry
- electro-optics

thin films

*electroconductivity*

USE **electrical resistivity**

**electrocutaneous communication**

- GS communicating
- . **electrocutaneous communication**
- RT perception
- sensory perception
- touch

*electrode dark current*

(added October 1997)

USE **dark current**

**electrode film barriers**

- RT ∞ barriers
- electrodes
- ∞ films
- polarization (charge separation)
- thin films

**electrode materials**

- RT anions
- anodes
- anodic coatings
- cathodes
- cathodic coatings
- cell anodes
- cell cathodes
- electrodes
- mischmetal
- photocathodes
- photoelectric cells
- photoelectric materials
- photoelectrochemical devices
- polypyrroles
- tube anodes

**electrodeless discharges**

- GS electric current
- . electric discharges
- . . **electrodeless discharges**
- RT ∞ discharge
- gas discharges
- glow discharges
- lightning
- Penning discharge
- radio frequency discharge
- ring discharge
- toroidal discharge
- Townsend discharge

**electrodeposition**

- GS deposition
- . **electrodeposition**
- . . electroplating
- RT cathodic coatings
- cell cathodes
- coulometers
- electrochemistry
- electroforming
- electroless deposition
- electrolysis
- electrolytes
- electrolytic cells
- electrophoresis
- electrowinning
- metal matrix composites
- metal powder
- plating
- powder metallurgy
- reduction (chemistry)

*electrodermal response*

USE **galvanic skin response**

**electrodes**

- DEF Terminals at which electricity passes from one medium into another. The positive electrodes are called the anodes; the negative electrodes are called the cathodes. In semiconductor devices, elements that perform one or more of the functions of emitting or collecting electrons or holes, or of controlling their movements by electric fields. In electron tubes, conducting elements that perform one or more of the functions of emitting, collecting, or control-

ling by electromagnetic fields, the movements of electrons or ions.

- GS **electrodes**
- . anodes
  - . . cell anodes
  - . . shell anodes
  - . . tube anodes
  - . cathodes
  - . . cell cathodes
  - . . hollow cathodes
  - . . tube cathodes
  - . . . cold cathodes
  - . . . hot cathodes
  - . . . photocathodes
  - . . . thermionic cathodes
  - . . . tunnel cathodes
  - . diffusion electrodes
  - . dynodes
  - . glass electrodes
  - . implanted electrodes (biology)
  - . ion selective electrodes
  - . plasma electrodes
  - . solid electrodes
  - . tube grids
- RT cold cathode tubes  
electric batteries  
electrochemistry  
electrode film barriers  
electrode materials  
electrolysis  
electroplating  
electrorefining  
electrowinning  
graphite  
photomultiplier tubes  
phototubes  
Tafel law  
transconductance

#### electrodialysis

- GS dialysis
- . **electrodialysis**
- RT colloids  
hydrometallurgy
- ∞ separation

#### electrodissolution

- RT dissociation  
electrochemical corrosion  
electrochemistry  
electrolysis

#### electrodynamics

DEF The science dealing with the forces and energy transformations of electric currents and the magnetic fields associated with them.

- GS **electrodynamics**
- . electrohydrodynamics
  - . electromechanics
  - . quantum electrodynamics
- RT Born-Infeld theory
- ∞ dynamics
- electric fields
  - electromagnetic interactions
  - electromechanical devices
  - line current
  - Maxwell equation
  - ponderomotive forces
  - traveling charge

#### electrodynamometers

USE **dynamometers**

#### electroencephalogram

USE **electroencephalography**

#### electroencephalography

- UF **EKG (electroencephalograms)**  
*electroencephalogram*
- GS bioengineering
- . biometrics
  - . . **electroencephalography**
- RT arousal  
body measurement (biology)  
brain  
electrophysiology  
medical electronics

medical equipment

#### electroepitaxy

DEF Crystal growth process achieved by passing an electric current through the substrate solution.

- GS growth
- . crystal growth
  - . . epitaxy
  - . . . **electroepitaxy**
- RT crystals  
hydrothermal crystal growth  
liquid phases  
traveling solvent method

#### electroerosion

USE **spark machining**

#### electroexplosive devices

USE **initiators (explosives)**

#### electroforming

- GS forming techniques
- . **electroforming**
- RT deposition  
electrodeposition  
electroless deposition  
electroplating  
spark machining

#### electrogenerators

USE **electric generators**

#### electrohydraulic control

USE **electric control**  
**hydraulic control**

#### electrohydraulic forming

- GS forming techniques
- . cold working
  - . . **electrohydraulic forming**
- RT explosive forming  
metal working

#### electrohydrodynamics

- GS electrodynamics
- . **electrohydrodynamics**
- mechanics (physics)
- . fluid mechanics
  - . . fluid dynamics
  - . . . hydrodynamics
  - . . . . **electrohydrodynamics**
  - . . hydromechanics
  - . . . hydrodynamics
  - . . . . **electrohydrodynamics**
- RT electric corona  
electrokinetics  
electron gas  
electron mobility  
ion distribution  
ionic mobility  
magnetohydrodynamics

#### electrojets

DEF Laterally limited, relatively intense electric currents located in the ionosphere.

- GS electric current
- . ionospheric currents
  - . . **electrojets**
  - . . . auroral electrojets
  - . . . equatorial electrojet
  - electricity
  - . atmospheric electricity
  - . . ionospheric currents
  - . . . **electrojets**
  - . . . . auroral electrojets
  - . . . . equatorial electrojet
- RT Birkeland currents  
Earth ionosphere  
geomagnetism  
ionospheric conductivity  
ionospheric drift  
ring currents

#### electrokinetics

- GS kinetics
- . **electrokinetics**
- RT electrohydrodynamics  
electromagnetic fields  
electromechanics

electrophysics

#### electroless deposition

DEF Controlled autocatalytic reduction method of depositing coatings.

- GS deposition
- . **electroless deposition**
- RT coatings  
electrodeposition  
electroforming  
metal coatings  
plating  
vacuum deposition  
vapor deposition

#### electroluminescence

DEF Emission of light caused by an application of electric fields to solids or gases. In gas electroluminescence, light is emitted when the kinetic energy of electron or ions accelerated in an electric field is transferred to the atoms or molecules of the gas in which the discharge takes place. Used for electroluminescent lamps.

- UF *electroluminescent lamps*
- GS emission
- . light emission
  - . . luminescence
  - . . . **electroluminescence**
- RT electro-optics  
light emitting diodes  
light sources  
porous silicon

#### electroluminescent lamps

USE **electroluminescence**  
**luminaires**

#### electrolysis

DEF The production of chemical changes by the passage of current through an electrolyte.

- GS electrochemistry
- . **electrolysis**
  - . . coulometry
- RT corrosion  
coulometers  
cracking (chemical engineering)  
current density  
decomposition  
electrochemical corrosion  
electrochemical synthesis  
electrodeposition  
electrodes  
electrodissolution  
electrolytes  
electrolytic cells  
electroplating  
hydrogen production  
ionic mobility  
metathesis  
passivity  
photolysis  
reduction (chemistry)  
Tafel law  
water splitting

#### electrolyte metabolism

- GS metabolism
- . **electrolyte metabolism**
- RT aerospace medicine  
aldosterone  
blood plasma  
body fluids  
physiological effects  
potassium  
sodium  
weightlessness

#### electrolytes

- GS conductors
- . **electrolytes**
  - . . anolytes
  - . . catholytes
  - . . ion exchange membrane electrolytes
  - . . jumpers
  - . . molten salt electrolytes
  - . . nonaqueous electrolytes
  - . . solid electrolytes
- RT conducting fluids  
Debye-Huckel theory

## electrolytic cells

- electric batteries
- electrochemistry
- electrodeposition
- electrolysis
- electrolytic cells
- electroplating
- electrorefining
- electrowinning
- fuel cells
- ions
- nonelectrolytes
- primary batteries
- Redox cells
- storage batteries
- wet cells

### electrolytic cells

DEF Unit apparatus in which electrochemical reactions are produced by applying electrical energy, or which supply electrical energy as a result of chemical reactions and which include two or more electrodes and one or more electrolytes contained in a suitable vessel. Used for galvanic cells.

UF *galvanic cells*

RT ∞ cells

- ∞ diaphragms
- diaphragms (mechanics)
- diffusion electrodes
- electric batteries
- ∞ electric cells
- electrochemistry
- electrodeposition
- electrolysis
- electrolytes
- electroplating
- electrorefining
- electrowinning
- ionic mobility
- lead acid batteries
- nonaqueous electrolytes
- phosphoric acid fuel cells

*electrolytic grinding*

USE **electrochemical machining**

### electrolytic polarization

GS polarization (charge separation)

. **electrolytic polarization**

RT depolarization  
magnesium cells

*electrolytic polishing*

USE **electropolishing**

### electromagnetic absorption

UF *ionospheric absorption*  
*light absorption*

*magnetic absorption*  
*optical absorption*

GS energy absorption  
. radiation absorption  
. . **electromagnetic absorption**

- . . . auroral absorption
- . . . gamma ray absorption
- . . . infrared absorption
- . . . microwave absorption
- . . . multiphoton absorption
- . . . photoabsorption
- . . . polar cap absorption
- . . . ultraviolet absorption
- . . . x ray absorption

RT absorbers (materials)

- absorbance
- ∞ absorption
- absorption spectra
- absorptivity
- activation
- atmospheric attenuation
- attenuation
- Beer law
- Bouguer law
- Chandrasekhar equation
- electromagnetic properties
- excitation
- fading
- fluorescence
- gamma ray absorptiometry
- irradiation
- laser induced fluorescence

- light scattering
- molecular absorption
- Mossbauer effect
- nuclear physics
- opacity
- optical properties
- optical reflection
- pair production
- perfectly matched layers
- photodecomposition
- photodissociation
- photon absorptiometry
- photoproduction
- radar absorbers
- radar attenuation
- radiation shielding
- radio attenuation
- reflection
- resonant frequencies
- signal fading
- solar energy absorbers
- Townsend avalanche
- transmission
- transmittance
- transparence
- wave attenuation
- wave propagation

### electromagnetic acceleration

DEF The use of perpendicular components of electric and magnetic fields to accelerate a current carrier.

RT ∞ acceleration

- electromagnetic interactions
- magnetic fields
- mass drivers
- particle acceleration
- plasma accelerators

### electromagnetic compatibility

GS compatibility

. **electromagnetic compatibility**

RT atmospheric  
crosstalk  
electronic countermeasures  
electronic warfare

∞ interference  
noise spectra  
radio frequency interference

*electromagnetic control*

USE **electromagnets**  
**remote control**

### electromagnetic coupling

(added September 1988)

GS coupling

. **electromagnetic coupling**

- . . microwave coupling
- . . optical coupling

RT electromagnetic interactions  
laser plasma interactions  
magnetosphere-ionosphere coupling  
plasma-electromagnetic interaction

*electromagnetic deduction*

USE **magnetic induction**

### electromagnetic environment experiment

DEF Shuttleborne radio frequency experiment.

GS payloads

- . Space Shuttle payloads
- . . **electromagnetic environment experiment**

### electromagnetic fields

GS **electromagnetic fields**

- . far fields
- . near fields
- . system generated electromagnetic pulses

RT Abrikosov theory  
biomagnetism  
blackout (propagation)  
electrokinetics  
electromagnetism  
electromechanics  
external surface currents  
field mode theory

- field strength
- field theory (physics)
- grand unified theory
- magnetic field configurations
- magnetic field inversions
- magnetic fields
- quantum electrodynamics
- reciprocity theorem
- solar magnetic field
- Sommerfeld approximation
- squeezed states (quantum theory)
- stellar magnetic fields
- unified field theory
- whistlers
- Yang-Mills fields

### electromagnetic hammers

GS tools

. hammers

. . **electromagnetic hammers**

RT forming techniques  
magnetic coils  
magnetic forming  
metal working

### electromagnetic interactions

GS **electromagnetic interactions**

- . photoproduction
- . plasma-electromagnetic interaction
- . . laser plasma interactions

RT biomagnetism

- electrodynamics
- electromagnetic acceleration
- electromagnetic coupling
- electrostatics
- electroweak interactions (field theory)
- electroweak model
- elementary particle interactions
- Feynman diagrams
- grand unified theory
- ∞ interactions
- meson-meson interactions
- photonuclear reactions
- plasma resonance
- quantum mechanics
- unified field theory
- wave interaction
- wave-particle interactions

### electromagnetic interference

GS **electromagnetic interference**

- . crosstalk
- . . ionospheric cross modulation
- . jamming
- . radio frequency interference
- . . blackout (propagation)
- . . . polar radio blackout
- . . . chirp
- . . . chirp signals
- . . . electromagnetic noise
- . . . . atmospherics
- . . . . ionospherics
- . . . . . dawn chorus
- . . . . . hiss
- . . . . . sudden enhancement of atmospherics

- . . . . . whistlers
- . . . . . cosmic noise
- . . . . . ionospheric noise
- . . . . . whistlers
- . . . . . shot noise
- . . . . . white noise
- . . . . . thermal noise
- . . . . . cochannel interference
- . . . . . ionospheric cross modulation

RT ∞ disturbances

- electronic countermeasures
- electronic warfare
- environments
- feedback
- ground effect (communications)
- ∞ interference
- interference immunity
- noise reduction
- SCATHA satellite
- signal to noise ratios

- system generated electromagnetic pulses
- electromagnetic levitation*  
(added February 2009)  
USE **magnetic suspension**
- electromagnetic measurement**
  - SN (MEASUREMENT OF ELECTROMAGNETIC PROPERTIES, QUANTITIES OR CONDITIONS)
  - GS **electromagnetic measurement**
    - . electromagnetic noise measurement
  - RT Barkhausen effect  
Earth terminal measurement system  
electrical measurement  
electromagnetism  
infrared detectors  
magnetic measurement  
magnetic transducers
    - ∞ measurement
    - signal measurement
- electromagnetic missiles**  
(added January 1992)
  - RT electric pulses  
external surface currents  
missiles  
picosecond pulses  
pulse communication  
pulse modulation  
wave attenuation  
wave degradation  
wave propagation
- electromagnetic noise**
  - UF *radiation noise*  
*radio frequency noise*
  - GS electromagnetic interference
    - . radio frequency interference
    - . . . **electromagnetic noise**
    - . . . . atmospherics
    - . . . . . ionospherics
    - . . . . . dawn chorus
    - . . . . . hiss
    - . . . . . sudden enhancement of atmospherics
    - . . . . whistlers
    - . . . cosmic noise
    - . . . ionospheric noise
    - . . . whistlers
    - . . . shot noise
    - . . . white noise
    - . . . thermal noise
  - RT background noise  
background radiation  
blackout (propagation)  
channel noise  
chirp signals  
extraterrestrial radiation  
ground effect (communications)  
microwaves  
millimeter waves
    - ∞ noise
    - noise generators
    - noise intensity
    - noise reduction
    - noise spectra
    - noise storms
    - noise temperature
    - radar receivers
    - ∞ radiation
    - radio receivers
    - radio spectra
    - radio waves
    - random noise
    - signal to noise ratios
    - solar radio emission
    - squelch circuits
    - submillimeter waves
- electromagnetic noise measurement**
  - GS electromagnetic measurement
    - . **electromagnetic noise measurement**
  - RT cosmic noise
    - ∞ measurement
    - thermal noise
- white noise
- electromagnetic propagation*  
USE **electromagnetic wave transmission**
- electromagnetic properties**
  - GS **electromagnetic properties**
    - . Faraday effect
    - . inductance
    - . . . proximity effect (electricity)
    - . Kerr magneto-optical effect
    - . magneto-resistivity
    - . optical properties
    - . . . absorptance
    - . . . absorptivity
    - . . . birefringence
    - . . . . Kerr electro-optical effect
    - . . . brightness
    - . . . . sky brightness
    - . . . brightness distribution
    - . . . color
    - . . . iridescence
    - . . . stellar color
    - . . . water color
    - . . . dichroism
    - . . . luminosity
    - . . . . stellar luminosity
    - . . . opacity
    - . . . optical bistability
    - . . . optical reflection
    - . . . phosphorescence
    - . . . photoconductivity
    - . . . photoviscoelasticity
    - . . . radiance
    - . . . reflectance
    - . . . . bidirectional reflectance
    - . . . . spectral reflectance
    - . . . refractivity
    - . . . . photorefractivity
    - . . . stigmatism
    - . . . translucence
    - . . . transmissivity
    - . . . transmittance
    - . . . transparency
    - . . . turbidity
    - . . . photoelasticity
    - . . . photoviscoelasticity
  - RT carrier mobility  
clarity  
electrical properties  
electromagnetic absorption  
gamma ray absorption  
gyrotropism  
magnetic properties
    - ∞ physical properties
    - polarization (waves)
    - ∞ properties
- electromagnetic propulsion**
  - GS propulsion
    - . electric propulsion
    - . . . **electromagnetic propulsion**
    - . . . magnetic sails
    - . low thrust propulsion
    - . . . **electromagnetic propulsion**
    - . . . magnetic sails
    - . spacecraft propulsion
    - . . . **electromagnetic propulsion**
    - . . . magnetic sails
  - RT electrostatic propulsion  
ion propulsion  
magnetoplasmadynamic thrusters  
mass drivers  
photonic propulsion  
plasma propulsion  
pulsed inductive thrusters  
pulsed plasma thrusters
- electromagnetic pulses**
  - UF *EMP (electromagnetism)*
  - GS electromagnetic radiation
    - . **electromagnetic pulses**
    - . . system generated electromagnetic pulses
    - pulsed radiation
    - . **electromagnetic pulses**
    - . . system generated electromagnetic pulses
    - pulses
    - . **electromagnetic pulses**
- . . system generated electromagnetic pulses
- RT electric pulses  
external surface currents  
picosecond pulses  
pulse communication  
pulse modulation  
pulse radar  
radar transmission
- electromagnetic pumps**
  - SN (ENCOMPASSES DEVICES FOR MATERIALS HANDLING ONLY--EXCLUDES OPTICAL AND PARTICLE ENERGIZING DEVICES)
  - GS pumps
    - . **electromagnetic pumps**
  - RT fuel pumps
- electromagnetic radiation**
  - DEF Energy propagated through space or through material media in the form of an advancing disturbance in electric and magnetic fields existing in space or in media. The term radiation, alone, is used commonly for this type of energy, although it actually has a broader meaning. Used for electromagnetic waves and wave radiation.
  - UF *electromagnetic waves*  
*wave radiation*
  - GS **electromagnetic radiation**
    - . bremsstrahlung
    - . Cerenkov radiation
    - . coherent electromagnetic radiation
    - . . coherent light
    - . . laser beams
    - . diffraction radiation
    - . electromagnetic pulses
    - . . system generated electromagnetic pulses
    - . electromagnetic surface waves
    - . gamma ray beams
    - . gamma rays
    - . gamma ray bursts
    - . H waves
    - . infrared radiation
    - . far infrared radiation
    - . near infrared radiation
    - . kilometeric waves
    - . light (visible radiation)
    - . . coherent light
    - . . gegenschein
    - . . polarized light
    - . . sky radiation
    - . . . airglow
    - . . . . geocoronal emissions
    - . . . . nightglow
    - . . . . twilight glow
    - . . . dayglow
    - . . . elves
    - . . . sprites (atmospheric physics)
    - . . sunlight
    - . . zodiacal light
    - . light beams
    - . . laser beams
    - . modulated continuous radiation
    - . monochromatic radiation
    - . nonequilibrium radiation
    - . nonthermal radiation
    - . . cyclotron radiation
    - . . . ion cyclotron radiation
    - . . . synchrotron radiation
    - . photon beams
    - . planetary radiation
    - . plasmons
    - . polarized electromagnetic radiation
    - . . polarized light
    - . . synchrotron radiation
    - . radio waves
    - . . decametric waves
    - . . extraterrestrial radio waves
    - . . . galactic radio waves
    - . . . . North Polar Spur (astronomy)
    - . . . . radio bursts
    - . . . . . solar radio bursts
    - . . . . . type 2 bursts
    - . . . . . type 3 bursts
    - . . . . . type 4 bursts
    - . . . . . type 5 bursts
    - . . . solar radio emission

# electromagnetic scattering

. . . . solar radio bursts  
. . . . . type 2 bursts  
. . . . . type 3 bursts  
. . . . . type 4 bursts  
. . . . . type 5 bursts  
. . . cosmic microwave background radiation  
. . long wave radiation  
. . radio emission  
. . . CN emission  
. . . hydroxyl emission  
. . . radio bursts  
. . . . solar radio bursts  
. . . . . type 2 bursts  
. . . . . type 3 bursts  
. . . . . type 4 bursts  
. . . . . type 5 bursts  
. . . solar radio emission  
. . . . solar radio bursts  
. . . . . type 2 bursts  
. . . . . type 3 bursts  
. . . . . type 4 bursts  
. . . . . type 5 bursts  
. . short wave radiation  
. . . microwaves  
. . . centimeter waves  
. . . cosmic microwave background radiation  
. . . . decimeter waves  
. . . . microwave emission  
. . . . millimeter waves  
. . . submillimeter waves  
. . sky waves  
. . . whistlers  
. Sommerfeld waves  
. terrestrial radiation  
. thermal radiation  
. . black body radiation  
. . phonon beams  
. tropospheric radiation  
. ultraviolet radiation  
. . extreme ultraviolet radiation  
. . far ultraviolet radiation  
. . . Lyman alpha radiation  
. . . Lyman beta radiation  
. . near ultraviolet radiation  
. . ultraviolet emission  
. x rays  
. . cosmic x rays  
. . solar x-rays  
RT photosynthetically active radiation  
aerospace environments  
antennas  
atmospheric radiation  
atmospheric refraction  
backward waves  
beams (radiation)  
coherent radiation  
continuous radiation  
corpusecular radiation  
cosmic rays  
cylindrical waves  
diffraction  
Doppler effect  
duochromators  
electroacoustic waves  
electromagnetism  
extraterrestrial radiation  
far fields  
flux (rate)  
flux density  
galactic radiation  
gamma ray absorption  
gauge invariance  
glare  
harmonic radiation  
incident radiation  
incoherent scattering  
interstellar radiation  
ionizing radiation  
Kerr electrooptical effect  
light emission  
magneto-optics  
near fields  
nonlinear optics  
nuclear radiation  
phase velocity  
photons  
Plancks constant

polarized radiation  
Poynting theorem  
∞ propagation  
propagation velocity  
pulsed radiation  
radar  
∞ radiation  
radiation chemistry  
radiation distribution  
radiation hazards  
radiation laws  
radiation pressure  
radiation sources  
radiative transfer  
∞ rays  
reflected waves  
reflection  
refracted waves  
Ronchi test  
scattering  
sine waves  
solar radiation  
solitary waves  
spectral emission  
spectral energy distribution  
spherical waves  
spontaneous emission  
Stefan-Boltzmann law  
stellar radiation  
stratosphere radiation  
telecommunication  
Thomson scattering  
transmission  
transverse waves  
traveling waves  
ultraviolet astronomy  
VLF emission recorders  
wave amplification  
wave dispersion  
wave generation  
∞ waves  
whispering gallery modes  
white holes (astronomy)

*electromagnetic rocket engines*  
(added April 2001)

USE **plasma engines**

## electromagnetic scattering

GS scattering  
. wave scattering  
. . **electromagnetic scattering**  
. . . ionospheric F-scatter propagation  
. . . light scattering  
. . . . halos  
. . . microwave scattering  
. . . Mie scattering  
. . . . Rayleigh scattering  
. . . Raman spectra  
. . . Thomson scattering  
. . . x ray scattering  
RT atmospheric attenuation  
atmospheric scattering  
finite difference time domain method  
magnetic dispersion  
optical coatings  
perfectly matched layers  
reciprocity theorem

## electromagnetic shielding

GS shielding  
. **electromagnetic shielding**  
. . radio frequency shielding  
RT magnetic shielding  
radiation shielding

## electromagnetic spectra

DEF Spectra of known electromagnetic radiations, extending from the shortest cosmic rays, through gamma rays, x rays, ultraviolet radiation, visible radiation, and including microwave and all other wavelengths of radio energy.

GS spectra  
. radiation spectra  
. . **electromagnetic spectra**  
. . . gamma ray spectra  
. . . infrared spectra  
. . . line spectra  
. . . . Balmer series  
. . . . D lines

. . . . electronic spectra  
. . . . Fraunhofer lines  
. . . . H lines  
. . . . . H alpha line  
. . . . . H beta line  
. . . . . H gamma line  
. . . . K lines  
. . . . Lyman spectra  
. . . . Paschen series  
. . . . Rydberg series  
. . . . telluric lines  
. . . radio spectra  
. . . . microwave spectra  
. . . Raman spectra  
. . . stellar spectra  
. . . . solar spectra  
. . . UVB spectra  
. . . ultraviolet spectra  
. . . vibrational spectra  
. . . visible spectrum  
. . . x ray spectra

RT absorption spectra  
astronomical spectroscopy  
electronic warfare  
emission spectra  
energy spectra  
light (visible radiation)  
molecular spectra  
noise spectra  
spectral correlation  
spectral reconnaissance

## electromagnetic surface waves

GS electromagnetic radiation  
. **electromagnetic surface waves**  
. surface waves  
. . **electromagnetic surface waves**  
RT dielectrics  
propagation modes  
radio waves  
∞ surfaces  
waveguides  
∞ waves

## electromagnetic wave filters

GS **electromagnetic wave filters**  
. bandpass filters  
. . crystal filters  
. . tracking filters  
. . electric filters  
. . bandstop filters  
. . crystal filters  
. . digital filters  
. . . FIR filters  
. . . IIR filters  
. . microwave filters  
. . radar filters  
. . radio filters  
. . tracking filters  
. . waveguide filters  
. . matched filters  
. . optical filters  
. . birefringent filters  
. . infrared filters  
. . ultraviolet filters  
RT absorbers (materials)  
adaptive filters  
attenuators  
correlation detection  
∞ filters  
high pass filters  
linear filters  
low pass filters  
nonlinear filters  
screen effect

## electromagnetic wave transmission

UF *electromagnetic propagation*  
GS transmission  
. **electromagnetic wave transmission**  
. . light transmission  
. . . light scattering  
. . . . halos  
. . . microwave attenuation  
. . . radar transmission  
. . . radio transmission  
. . . double sideband transmission  
. . . ionospheric propagation

. . . . ionospheric F-scatter propagation  
 . . . microwave transmission  
 . . . multipath transmission  
 . . . short wave radio transmission  
 . . . single sideband transmission  
 . . . spread spectrum transmission  
 . . . transequatorial propagation  
 . . . transhorizon radio propagation  
 . . scatter propagation  
 . . . ionospheric F-scatter propagation  
 . . television transmission

RT atmospheric attenuation  
 attenuation  
 Fermat principle  
 incoherent scattering  
 lossy media  
 magnetoionics  
 plasma decay  
 plasmaguides  
 radar attenuation  
 radio attenuation  
 radome materials  
 screen effect  
 transmission efficiency  
 wave propagation  
 whispering gallery modes

*electromagnetic waves*  
 USE **electromagnetic radiation**

*electromagnetics*  
 USE **electromagnetism**

**electromagnetism**  
 DEF Magnetism produced by an electric current. The science dealing with the physical relations between electricity and magnetism. Used for electromagnetics.  
 UF *electromagnetics*  
 GS **electromagnetism**  
 . magnetostatics  
 RT Barkhausen effect  
 Biot-Savart law  
 computational electromagnetics  
 electric fields  
 electricity  
 electromagnetic fields  
 electromagnetic measurement  
 electromagnetic radiation  
 electromagnets  
 electrophysics  
 grand unified theory  
 magnet coils  
 magnetic coils  
 magnetic field inversions  
 magnetic fields  
 magnetic properties  
 magnetoresistivity  
 unified field theory

**electromagnets**  
 UF *electromagnetic control*  
 GS magnets  
 . **electromagnets**  
 . . high field magnets  
 . . superconducting magnets

RT electromagnetism  
 field coils  
 magnet coils  
 racetracks (particle accelerators)  
 solenoids

**electromechanical devices**  
 GS **electromechanical devices**  
 . microelectromechanical systems  
 . . lab-on-a-chip devices  
 . . microoptoelectromechanical systems  
 . electric motors  
 . piezoelectric actuators  
 . . asynchronous motors  
 . . induction motors  
 . . micromotors  
 . . piezoelectric motors  
 . . stepping motors  
 . . synchronous motors  
 . . torque motors

RT ∞ electric equipment  
 electroactive polymers

electrodynamics  
 electromechanics  
 ∞ equipment  
 homopolar generators

**electromechanics**  
 GS electrodynamics  
 . **electromechanics**  
 RT circuits  
 electric fields  
 elektrokinetiks  
 electromagnetic fields  
 electromechanical devices  
 electrostatics  
 magnetic field inversions  
 magnetic fields  
 Maxwell equation  
 mechanics (physics)

**electrometers**  
 DEF Instruments for measuring differences of electric potential.  
 GS measuring instruments  
 . **electrometers**  
 RT electric charge  
 electrical measurement  
 electron counters  
 galvanometers  
 potentiometers (instruments)  
 voltmeters  
 wattmeters

**electromigration**  
 RT electrical resistivity  
 electron mobility  
 hole mobility  
 ionic mobility  
 polarization (charge separation)  
 thermocapillary migration  
 thermomigration

**electromotive forces**  
 DEF Forces capable of maintaining a potential difference, and thus a current, within a circuit. They can be established by chemical action or by mechanical work.  
 GS **electromotive forces**  
 . ponderomotive forces  
 RT electric batteries  
 electric generators  
 electric potential  
 Ohms law  
 open circuit voltage

*electromyograms*  
 USE **electromyography**

*electromyographs*  
 USE **electromyography**

**electromyography**  
 DEF The study of the response of a muscle to an electric stimulation. Used for electromyograms and electromyographs.  
 UF *electromyograms*  
*electromyographs*  
 GS bioengineering  
 . biometrics  
 . . **electromyography**  
 RT electrophysiology  
 medical electronics  
 myoelectricity

**electron acceleration**  
 DEF The acceleration of electrons by action of solar cosmic rays.  
 GS rates (per time)  
 . acceleration (physics)  
 . . **electron acceleration**  
 RT ∞ acceleration  
 cosmic rays  
 electrons  
 extraterrestrial radiation  
 particle beams  
 solar cosmic rays

**electron accelerators**  
 GS particle accelerators  
 . **electron accelerators**  
 . . betatrons

RT ∞ accelerators  
 linear accelerators  
 synchrotrons  
 Van de Graaff accelerators

**electron affinity**  
 GS affinity  
 . **electron affinity**  
 RT anions  
 molecular ions  
 negative electron affinity  
 semiconductors (materials)

**electron attachment**  
 GS **electron attachment**  
 . nucleophiles  
 RT ∞ attachment  
 gas ionization  
 ionization

**electron avalanche**  
 DEF The process in which a relatively small number of free electrons in a gas that is subjected to a strong electric field accelerate, ionize gas atoms by collision, and thus form new free electrons to undergo the same process in cumulative fashion.  
 GS avalanches  
 . **electron avalanche**  
 RT CATT devices  
 channel multipliers  
 free electrons  
 gas discharges  
 Townsend avalanche

**electron beam welding**  
 GS welding  
 . fusion welding  
 . . **electron beam welding**  
 RT arc welding  
 electric welding  
 spiking

**electron beams**  
 DEF Specifically, focused streams of electrons used for neutralization of the positively charged ion beam in an ion engine. Also used to melt or weld materials with externally high melting points.  
 GS beams (radiation)  
 . particle beams  
 . . **electron beams**  
 . . . relativistic electron beams  
 particles  
 . corpuscular radiation  
 . . electron radiation  
 . . . **electron beams**  
 . . . . relativistic electron beams

RT beam injection  
 beam neutralization  
 beam plasma amplifiers  
 beta particles  
 Brillouin flow  
 diffraction radiation  
 electron cyclotron heating  
 ionizing radiation  
 magnetic lenses  
 monoscopes  
 nanofabrication  
 plasma jets  
 scalloping  
 scanning electron microscopy  
 transmission electron microscopy

**electron bombardment**  
 RT ∞ bombardment  
 deposition  
 particle beams  
 plasma jets  
 relativistic electron beams  
 sputtering

**electron bunching**  
 GS bunching  
 . **electron bunching**  
 RT catchers  
 convection currents  
 klystrons  
 traveling wave tubes

## electron capture

velocity modulation

### electron capture

GS nuclear reactions  
. nuclear interactions  
. . nuclear capture  
. . . **electron capture**  
. . spin-orbit interactions  
. . . **electron capture**  
particle interactions  
. elementary particle interactions  
. . nuclear capture  
. . . **electron capture**  
. nuclear interactions  
. . nuclear capture  
. . . **electron capture**  
. . spin-orbit interactions  
. . . **electron capture**  
spin  
. spin-orbit interactions  
. . **electron capture**  
RT capture effect  
many electron effects

### electron clouds

RT  $\infty$  clouds  
orbitrons  
space charge

### electron collisions

USE **electron scattering**

### electron compounds

USE **intermetallics**

### electron counters

UF *electron detectors*  
GS measuring instruments  
. counters  
. . radiation counters  
. . . **electron counters**  
. radiation measuring instruments  
. . radiation counters  
. . . **electron counters**  
RT electrometers  
ionization chambers

### electron cyclotron heating

DEF A type of radio frequency plasma heating in which high-power microwave energy is introduced into the plasma region.

GS heating  
. plasma heating  
. . **electron cyclotron heating**  
RT electron beams  
electron cyclotron resonance  
electron guns  
klystrons  
magnetic pumping

### electron cyclotron resonance

(added June 1997)  
GS resonance  
. cyclotron resonance  
. . **electron cyclotron resonance**  
RT cyclotron resonance devices  
electron cyclotron heating  
plasma heating  
plasma resonance

### electron decay rate

GS rates (per time)  
. decay rates  
. . **electron decay rate**  
RT muons  
secondary cosmic rays

### electron density (concentration)

GS density (number/volume)  
. particle density (concentration)  
. . **electron density (concentration)**  
. . . carrier density (solid state)  
. . . electron density profiles  
. . . ionospheric electron density  
. . . magnetospheric electron density  
RT atmospheric composition  
atmospheric density  
atom concentration  
density functional theory  
free electrons

ion density (concentration)  
plasma density  
plasma frequencies  
radiation belts  
semiconductors (materials)  
space density

### electron density profiles

GS density (number/volume)  
. particle density (concentration)  
. . electron density (concentration)  
. . . **electron density profiles**  
. . electron distribution  
. . . **electron density profiles**  
distribution (property)  
. electron distribution  
. . **electron density profiles**  
gradients  
. **electron density profiles**  
RT angular distribution  
atmospheric electricity  
atmospheric ionization

### electron detectors

USE **electron counters**

### electron diffraction

DEF The phenomenon, or the technique of producing diffraction patterns through the incidence of electrons as a function of kinetic energy.

GS diffraction  
. **electron diffraction**  
RT Bragg angle  
diffraction radiation  
x ray diffraction

### electron diffusion

GS diffusion  
. particle diffusion  
. . **electron diffusion**  
RT ambipolar diffusion  
diffusion length  
diffusion waves  
gaseous self-diffusion  
ionic diffusion  
plasma diffusion  
thermal diffusion

### electron distribution

GS density (number/volume)  
. particle density (concentration)  
. . **electron distribution**  
. . . electron density profiles  
distribution (property)  
. **electron distribution**  
. . electron density profiles  
RT charge distribution  
current distribution  
density functional theory  
Thomas-Fermi model  
vertical distribution

### electron emission

GS emission  
. particle emission  
. . **electron emission**  
. . . field emission  
. . . photoelectric emission  
. . . secondary emission  
RT cathodes  
electric discharges  
emitters  
negative electron affinity  
pair production  
photoelectric materials  
photoelectron spectroscopy  
photoelectrons  
photoionization  
radio frequency discharge  
self sustained emission  
stimulated emission  
thermal emission  
thermionic emission  
thermionics  
work functions

### electron energy

UF *electron temperature*  
*electronic levels*

GS particle energy  
. **electron energy**  
. . electron states  
RT activation energy  
electronic structure  
electrostatic probes  
 $\infty$  energy  
forbidden bands  
Hartree-Fock-Slater method  
interfacial energy  
ionospheric temperature  
kinetic energy  
noise temperature  
plasmas (physics)  
proton energy  
space temperature  
surface energy  
temperature

### electron flux

USE **electrons flux (rate)**

### electron flux density

SN (LIMITED TO ELECTRON EMISSION OR DETECTION RATE PER UNIT AREA)  
UF *electron intensity*  
GS rates (per time)  
. flux density  
. . radiant flux density  
. . . particle flux density  
. . . . **electron flux density**  
RT irradiance  
radiancy  
solar flux density

### electron gas

RT cosmic gases  
electrohydrodynamics  
free electrons  
ionized gases  
plasmons  
quantum Hall effect  
rarefied gases  
screen effect  
superconductors (materials)

### electron guns

DEF Electrode structures which produce and may control, focus, deflect, and converge one or more electron beams.

RT cathode ray tubes  
crossed field guns  
electron cyclotron heating  
flying spot scanners  
 $\infty$  guns  
magnetic lenses  
particle accelerators  
plasma guns  
tube anodes  
tube cathodes  
tube grids

### electron holes

USE **holes (electron deficiencies)**

### electron impact

GS impact  
. **electron impact**  
RT ion impact  
point impact  
proton impact

### electron intensity

USE **electron flux density**

### electron interactions

USE **electron scattering**

### electron ionization

USE **ionization**

### electron irradiation

GS irradiation  
. **electron irradiation**  
RT auroral irradiation  
ion irradiation  
secondary emission

### electron mass

GS mass

. particle mass  
 . . **electron mass**  
 RT electrons

**electron microscopes**  
 GS microscopes  
 . **electron microscopes**  
 RT field emission  
 ion microscopes  
 magnetic lenses  
 microanalysis  
 optical microscopes  
 photomicrography  
 replicas  
 scanning electron microscopy  
 scanning tunneling microscopy

**electron microscopy**  
 DEF The interpretive application of an electron microscope for the magnification of materials that cannot be properly seen with an optical microscope.  
 GS microscopy  
 . **electron microscopy**  
 . . scanning electron microscopy  
 . . scanning tunneling microscopy  
 . . transmission electron microscopy  
 RT field emission  
 ion microscopes  
 magnetic lenses  
 microanalysis  
 phase contrast

**electron mobility**  
 GS electrical properties  
 . carrier mobility  
 . . **electron mobility**  
 mobility  
 . carrier mobility  
 . . **electron mobility**  
 transport properties  
 . carrier mobility  
 . . **electron mobility**  
 RT ambipolar diffusion  
 atomic mobilities  
 charge carriers  
 electrohydrodynamics  
 electromigration  
 high electron mobility transistors  
 hole mobility  
 majority carriers  
 minority carriers  
 modulation doping  
 NDM semiconductor devices  
 semiconductor plasmas  
 single electron transistors  
 ∞ solid state physics  
 square wells

*electron multipliers*  
 USE **photomultiplier tubes**

**electron optics**  
 DEF The science that deals with the propagation of electrons, as light optics deals with light and its phenomena.  
 RT atom optics  
 beam switching  
 Brillouin flow  
 cathode ray tubes  
 electro-optics  
 flying spot scanners  
 ion optics  
 ∞ optics  
 particle trajectories  
 steering

**electron orbitals**  
 GS orbitals  
 . **electron orbitals**  
 RT configuration interaction  
 electronic structure  
 excimers

**electron oscillations**  
 GS oscillations  
 . **electron oscillations**  
 RT oscillator strengths  
 plasma oscillations

transient oscillations

**electron paramagnetic resonance**  
 UF *electron spin resonance*  
 GS resonance  
 . magnetic resonance  
 . . paramagnetic resonance  
 . . . **electron paramagnetic resonance**  
 RT Jahn-Teller effect

*electron paths*  
 USE **electron trajectories**

**electron phonon interactions**  
 RT ∞ interactions  
 particle interactions  
 plasma-particle interactions  
 polarons  
 superconductivity  
 thermodynamic coupling

**electron photography**  
 GS imagery  
 . photography  
 . . **electron photography**  
 RT black and white photography

**electron photon cascades**  
 RT bremsstrahlung  
 ∞ cascades  
 cosmic ray showers  
 pair production  
 secondary cosmic rays

**electron plasma**  
 GS particles  
 . charged particles  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **electron plasma**  
 . corpuscular radiation  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **electron plasma**  
 RT electron-positron plasmas  
 helium plasma  
 high temperature plasmas  
 Landau damping  
 metallic plasmas  
 plasma waves  
 plasma-particle interactions  
 rarefied plasmas  
 relativistic plasmas  
 thermal plasmas

**electron precipitation**  
 GS particle precipitation  
 . **electron precipitation**  
 particles  
 . corpuscular radiation  
 . . **electron precipitation**  
 RT auroras  
 ∞ precipitation  
 proton precipitation  
 radiation belts  
 secondary cosmic rays  
 trapped particles

**electron pressure**  
 GS pressure  
 . radiation pressure  
 . . **electron pressure**

**electron probes**  
 DEF Narrow beams of electrons used to scan or illuminate an object or screen.  
 GS measuring instruments  
 . **electron probes**  
 RT chemical analysis  
 irradiation  
 microwave plasma probes  
 spectrometers

**electron pumping**  
 RT energy transfer  
 excimer lasers  
 gas lasers  
 lasers  
 nuclear pumping

nuclear radiation  
 optical pumping  
 population inversion  
 ∞ pumping  
 stimulated emission  
 stimulated emission devices

**electron radiation**  
 SN (LIMITED TO RADIATION CONSISTING OF ELECTRONS--EXCLUDES ELECTROMAGNETIC RADIATION)  
 GS particles  
 . corpuscular radiation  
 . . **electron radiation**  
 . . . beta particles  
 . . . electron beams  
 . . . . relativistic electron beams  
 RT bremsstrahlung  
 nuclear radiation  
 plasma radiation  
 proton irradiation  
 ∞ radiation  
 radiation effects

**electron recombination**  
 GS recombination reactions  
 . **electron recombination**  
 . . radiative recombination  
 RT ion recombination  
 neutral particles

*electron ring accelerators*  
 USE **storage rings (particle accelerators)**

**electron runaway (plasma physics)**  
 DEF High acceleration of electrons in a collisional plasma caused by a suddenly applied electric field (which greatly reduces the collision cross section of the electrons).  
 GS scattering  
 . electron scattering  
 . . **electron runaway (plasma physics)**  
 RT collisional plasmas  
 high acceleration  
 plasma physics  
 scattering cross sections

**electron scattering**  
 UF *electron collisions*  
*electron interactions*  
 GS scattering  
 . **electron scattering**  
 . . electron runaway (plasma physics)  
 RT atomic collisions  
 dense plasmas  
 elastic scattering  
 inelastic scattering  
 ion scattering  
 many electron effects  
 nuclear reactions  
 nuclear scattering  
 particle interactions  
 photon-electron interaction  
 Ramsauer effect  
 recoil ions  
 relativistic electron beams  
 transmission electron microscopy  
 Umklapp process

**electron sources**  
 RT ∞ energy sources  
 ion sources  
 ∞ power supplies  
 radiation sources  
 ∞ sources

**electron spectroscopy**  
 DEF The study and interpretation of atomic, molecular, and solid state structure based on x ray induced electron emission from substances.  
 GS spectroscopy  
 . **electron spectroscopy**  
 RT absorption spectra  
 emission spectra  
 infrared spectroscopy  
 molecular spectroscopy  
 optical emission spectroscopy



## electron spin

x ray absorption

**electron spin**  
GS spin  
. particle spin  
. . **electron spin**  
RT angular momentum  
nuclear spin  
spin dynamics

*electron spin resonance*  
USE **electron paramagnetic resonance**

**electron states**  
GS level (quantity)  
. energy levels  
. . **electron states**  
particle energy  
. electron energy  
. . **electron states**  
RT density functional theory  
electronic structure  
excimers  
excitation  
ground state  
many electron effects  
noise temperature

*electron sweeping*  
USE **sweep frequency**

*electron telescopes*  
USE **particle telescopes**

*electron temperature*  
USE **electron energy**

**electron trajectories**  
DEF The paths of electrons. Used for electron paths.  
UF *electron paths*  
GS trajectories  
. particle trajectories  
. . **electron trajectories**  
RT diffraction paths  
magnetic rigidity  
radiation belts

**electron transfer**  
RT backward wave tubes  
charge exchange  
charge transfer  
oxidation  
transferred electron devices  
transferring

**electron transitions**  
RT atomic theory  
Auger effect  
Auger spectroscopy  
Balmer series  
band structure of solids  
Bohr theory  
conduction bands  
excimers  
excitation  
forbidden transitions  
Franck-Condon principle  
Jahn-Teller effect  
lasing  
many electron effects  
nuclear capture  
optical transition  
oscillator strengths  
Paschen series  
Rydberg series  
 $\infty$  transition  
transition probabilities  
x ray lasers  
xenon chloride lasers  
xenon fluoride lasers

**electron tubes**  
DEF Devices in which conduction by electrons takes place through a vacuum of gaseous medium within a gas tight envelope.  
GS **electron tubes**  
. camera tubes  
. . image dissector tubes  
. . orthicons

. . . image orthicons  
. . vidicons  
. . . return beam vidicons  
. . . . thermicons  
. cold cathode tubes  
. phototubes  
. . photomultiplier tubes  
. . . . frequency modulation photomultipliers  
. gas discharge tubes  
. . ignitrons  
. . thyratrons  
. image tubes  
. . thermicons  
. thermionic diodes  
. . cesium diodes  
. vacuum tubes  
. . cathode ray tubes  
. . . . monoscopes  
. . . picture tubes  
. . cesium diodes  
. . microwave tubes  
. . . . telescopes  
. . . cyclotron resonance devices  
. . . klystrons  
. . . magnetrons  
. . . . nigotrons  
. . . planotrons  
. . . traveling wave tubes  
. . . . backward wave tubes  
. . . . . helitrons  
. . . . . carcinotrons  
. . vacuum tube oscillators  
RT cavity resonators  
circuits  
crossed field amplifiers  
diodes  
fiber optics  
 $\infty$  heaters  
modulators  
orbitrons  
oscillators  
pentodes  
rectifiers  
resonators  
tetrodes  
transconductance  
triodes  
tube grids  
 $\infty$  tubes  
tunnel cathodes  
velocity modulation  
x ray tubes

## electron tunneling

UF *tunnel resistors*  
energy levels  
RT Josephson effect  
MIM diodes  
quantum dots  
resonant tunneling  
scanning tunneling microscopy  
semiconductors (materials)  
single electron transistors  
superconductivity  
tunnel diodes  
tunnel junctions  
 $\infty$  tunneling

## electronarcosis

RT electroanesthesia  
electrophysiology

## electron-hole drops

DEF Exciton condensations exhibiting the properties of electrically conducting plasmas which form in germanium and silicon crystals at sufficiently low cryogenic temperatures.  
RT carrier density (solid state)  
luminescence  
magnetic fields  
optical pumping  
phase transformations  
plasma density  
plasma equilibrium  
semiconductor plasmas

single event upsets

## electronic aircraft

DEF Designation for tactical electronic warfare aircraft.  
RT  $\infty$  aircraft  
automatic control  
electronic countermeasures

*electronic amplifiers*

USE **amplifiers**

## electronic bulletin boards

(added September 1993)  
UF *computer bulletin boards*  
RT communication networks  
computer conferencing  
electronic mail  
Internet resources  
internets  
websites  
World Wide Web

## electronic commerce

(added April 2000)  
DEF The buying and selling of goods and services via the Internet or other computer communications network.  
UF *e-commerce*  
GS commerce  
. **electronic commerce**  
RT computer information security  
electronic mail  
Internet resources  
websites  
World Wide Web

## electronic control

RT automatic control  
cascade control  
 $\infty$  control  
control equipment  
control systems design  
controllers  
current regulators  
electric control  
electric switches  
feedback control  
hydraulic control  
optical control  
pneumatic control  
remote control  
Terminal Configured Vehicle Program  
voltage regulators

## electronic countermeasures

GS countermeasures  
. **electronic countermeasures**  
. . antiradar coatings  
. . chaff  
RT deception  
electromagnetic compatibility  
electromagnetic interference  
electronic aircraft  
electronic warfare  
jamming  
optical countermeasures  
radar detection  
radio frequency interference  
stealth technology

## electronic equipment

DEF Equipment in which electricity is conducted principally by electrons moving through a vacuum, gas, or semiconductor.  
GS **electronic equipment**  
. diodes  
. . crystal rectifiers  
. . plasma diodes  
. . semiconductor diodes  
. . . avalanche diodes  
. . . . cryosar  
. . . . Barritt diodes  
. . . germanium diodes  
. . . Gunn diodes  
. . . . transferred electron devices  
. . . junction diodes  
. . . . MIM diodes  
. . . . step recovery diodes  
. . . light emitting diodes

- . . . parametric diodes
- . . . photodiodes
- . . . Schottky diodes
- . . . tunnel diodes
- . . . . resonant tunneling diodes
- . . . varactor diodes
- . . . thermionic diodes
- . . . cesium diodes
- . . . electronic filters
- . . . electronic modules
- . . . micromodules
- . . . electronic packaging
- . . . electronic recording systems
- . . . electronic transducers
- . . . miniature electronic equipment
- . . . solid state devices
- . . . cryotrons
- . . . crystal rectifiers
- . . . metal-nitride-oxide-semiconductors
- . . . multispectral linear arrays
- . . . semiconductor devices
- . . . . avalanche diodes
- . . . . cryosar
- . . . . Barritt diodes
- . . . . charge transfer devices
- . . . . bucket brigade devices
- . . . . charge coupled devices
- . . . . charge injection devices
- . . . . germanium diodes
- . . . . heterojunction devices
- . . . . high electron mobility transistors
- . . . . . MODFETS
- . . . . junction diodes
- . . . . MIM diodes
- . . . . step recovery diodes
- . . . . light emitting diodes
- . . . . metal oxide semiconductors
- . . . . CMOS
- . . . . ITO (semiconductors)
- . . . . SOS (semiconductors)
- . . . . MIM (semiconductors)
- . . . . MIS (semiconductors)
- . . . . MOM (semiconductors)
- . . . . MSM (semiconductors)
- . . . . NDM semiconductor devices
- . . . . neuristors
- . . . . parametric diodes
- . . . . photodiodes
- . . . . photovoltaic cells
- . . . . . solar cells
- . . . . . vertical junction solar cells
- . . . . Schottky diodes
- . . . . semiconductor lasers
- . . . . . aluminum gallium arsenide lasers
- . . . . . gallium arsenide lasers
- . . . . . quantum cascade lasers
- . . . . . quantum well lasers
- . . . . . YLF lasers
- . . . . SOI (semiconductors)
- . . . . thermistors
- . . . . thyristors
- . . . . . silicon controlled rectifiers
- . . . . transferred electron devices
- . . . . transistor amplifiers
- . . . . transistors
- . . . . . bipolar transistors
- . . . . . field effect transistors
- . . . . . . charge flow devices
- . . . . . . JFET
- . . . . . . MODFETS
- . . . . . . high electron mobility transistors
- . . . . . . . MODFETS
- . . . . . . junction transistors
- . . . . . . . JFET
- . . . . . phototransistors
- . . . . . silicon transistors
- . . . . . . SOS (semiconductors)
- . . . . . . single electron transistors
- . . . . . cascode devices
- . . . . . quantum well infrared photodetectors
- . . . . . . resonant tunneling diodes
- . . . . . TRAPATT devices
- . . . . . varactor diodes
- . . . . . varistors
- . . . . . SIS (semiconductors)
- . . . . . SIS (superconductors)
- . . . . . solid state lasers

- . . . aluminum gallium arsenide lasers
- . . . DBR lasers
- . . . fiber lasers
- . . . gallium arsenide lasers
- . . . quantum cascade lasers
- . . . quantum well lasers
- . . . ruby lasers
- . . . . YAG lasers
- . . . . YLF lasers
- . . . . spacecraft electronic equipment
- RT antenna components
- bubble technique
- ∞ electric equipment
- ∞ electronics
- ∞ equipment
- radiation hardening
- spherical antennas
- system generated electromagnetic pulses

**electronic equipment tests**

- SN (CHECKOUT OF ELECTRONIC EQUIPMENT)
- RT Earth terminal measurement system
- electric equipment tests
- electrical measurement
- environmental tests
- fault detection
- nondestructive tests
- oscilloscopes
- quality control
- resonance testing
- self tests
- stability tests
- ∞ test equipment
- ∞ tests
- vibration tests

**electronic filters**

- GS electronic equipment
- . **electronic filters**
- RT electric filters
- ∞ filters
- FIR filters

*electronic levels*

- USE **electron energy energy levels**

**electronic mail**

- UF *e-mail*
- GS telecommunication
- . **electronic mail**
- RT communication networks
- communication satellites
- computer conferencing
- computer networks
- data transmission
- electronic bulletin boards
- electronic commerce
- electronic publishing
- Internet resources
- internets

**electronic modules**

- GS electronic equipment
- . **electronic modules**
- . . micromodules
- modules
- . **electronic modules**
- . . micromodules
- RT ∞ hardware
- miniature electronic equipment
- modularity
- subminiaturization

**electronic packaging**

- GS electronic equipment
- . **electronic packaging**
- packaging
- . **electronic packaging**
- RT circuit boards
- DTL integrated circuits
- encapsulating
- hybrid circuits
- integrated circuits
- large scale integration
- linear integrated circuits
- medium scale integration
- micromodules

- printed circuits
- thick films
- TTL integrated circuits

*electronic photography*

- USE **electro-optical photography**

**electronic publishing**

- (added July 1995)
- RT computer conferencing
- document markup languages
- documents
- electronic mail
- hypertext
- information dissemination
- multimedia
- printing

**electronic recording systems**

- GS electronic equipment
- . **electronic recording systems**
- RT recording instruments
- ∞ systems
- tape recorders

*electronic signal measurement*

- USE **signal measurement**

**electronic spectra**

- SN (EMISSION OR ABSORPTION MOLECULAR SPECTRA OF AN ELECTRON TRANSITION)
- GS molecular properties
- . molecular spectra
- . . **electronic spectra**
- spectra
- . energy spectra
- . . **electronic spectra**
- . . molecular spectra
- . . **electronic spectra**
- . radiation spectra
- . . electromagnetic spectra
- . . . line spectra
- . . . . **electronic spectra**
- RT absorption spectra
- emission spectra
- Lyman spectra
- spectral bands
- vibrational spectra

**electronic structure**

- (added April 1999)
- SN (THE TERM "ATOMIC STRUCTURE" WAS USED FOR THIS CONCEPT PRIOR TO MAY 1999)
- RT atomic structure
- band structure of solids
- density functional theory
- electron energy
- electron orbitals
- electron states
- energy bands
- energy gaps (solid state)
- energy levels
- Fermi liquids

*electronic switches*

- USE **switching circuits**

**electronic transducers**

- GS electronic equipment
- . **electronic transducers**
- transducers
- . **electronic transducers**
- RT magnetic transducers
- ∞ sensors
- ultrasonic wave transducers

**electronic warfare**

- DEF Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum, and action which retains friendly use of the electromagnetic spectrum.
- GS military operations
- . **electronic warfare**
- warfare
- . **electronic warfare**
- RT air defense
- antiradar coatings
- chaff
- combat

deception  
 electromagnetic compatibility  
 electromagnetic interference  
 electromagnetic spectra  
 electronic countermeasures  
 evasive actions  
 jamming  
 missile detection  
 peacetime  
 radar detection  
 radio frequency interference  
 stealth technology  
 strategy

∞ **electronics**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Study and application of the motions of electrons through vacuum and gaseous, conducting, or semiconducting media. Used for photoelectronics.

UF *photoelectronics*  
 RT *astrionics*

avionics  
 digital electronics  
 electrical engineering  
 electricity  
 electronic equipment  
 electrophysics  
 medical electronics  
 microelectronics  
 molecular electronics  
 nucleonics  
 quantum electronics  
 radio electronics  
 thermionics  
 transistor circuits  
 volt-ampere characteristics

**electron-ion recombination**

GS recombination reactions  
 . **electron-ion recombination**  
 . . radiative recombination  
 RT ion recombination  
 plasma control

**electronography**

RT electrophysiology  
 printing

*electron-positron annihilation*

USE **positron annihilation**

**electron-positron pairs**

(added September 1988)

GS particles  
 . elementary particles  
 . . **electron-positron pairs**  
 RT annihilation reactions  
 charged particles  
 electron-positron plasmas  
 electrons  
 pair production  
 positron annihilation  
 positrons

**electron-positron plasmas**

(added September 1988)

GS particles  
 . charged particles  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **electron-positron plasmas**  
 . corpuscular radiation  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **electron-positron plasmas**

RT electron plasma  
 electron-positron pairs  
 electrons  
 positrons  
 relativistic plasmas

**electrons**

DEF Particles of very small mass, carrying a unit negative or positive charge. Negative electrons, surrounding the nucleus (i.e., orbital electrons) are present in all atoms. Their number is equal to the number of positive charges (or protons) in the particular nucleus. The term

electron, when used alone, commonly refers to a negative electron. A positive electron is usually called a positron, and a negative electron is sometimes called a negatron.

UF *electron flux*  
*nonrelativistic electrons*

GS particles  
 . charged particles  
 . . energetic particles  
 . . . **electrons**  
 . . . . conduction electrons  
 . . . . free electrons  
 . . . . high energy electrons  
 . . . . . relativistic electron beams  
 . . . . hot electrons  
 . . . . N electrons  
 . . . . negatrons  
 . . . . photoelectrons  
 . . . . pi-electrons  
 . . . . polarons  
 . . . . solar electrons  
 . corpuscular radiation  
 . . energetic particles  
 . . . **electrons**  
 . . . . conduction electrons  
 . . . . free electrons  
 . . . . high energy electrons  
 . . . . . relativistic electron beams  
 . . . . hot electrons  
 . . . . N electrons  
 . . . . negatrons  
 . . . . photoelectrons  
 . . . . pi-electrons  
 . . . . polarons  
 . . . . solar electrons  
 . elementary particles  
 . . fermions  
 . . . leptons  
 . . . . **electrons**  
 . . . . . conduction electrons  
 . . . . . free electrons  
 . . . . . high energy electrons  
 . . . . . relativistic electron beams  
 . . . . . hot electrons  
 . . . . . N electrons  
 . . . . . negatrons  
 . . . . . photoelectrons  
 . . . . . pi-electrons  
 . . . . . polarons  
 . . . . . solar electrons  
 RT acceptor materials  
 beta particles  
 Bohr magneton  
 cosmic rays  
 donor materials  
 electron acceleration  
 electron mass  
 electron-positron pairs  
 electron-positron plasmas  
 excitons  
 holes (electron deficiencies)  
 Lewis base  
 majority carriers  
 ∞ materials  
 minority carriers  
 muonium  
 n-type semiconductors  
 nuclear radiation  
 Pomeranchuk theorem  
 quantum numbers  
 radiation belts  
 semiconductors (materials)  
 Suhl effect

**electronystagmography**

GS bioengineering  
 . biometrics  
 . . **electronystagmography**  
 physiological tests  
 . **electronystagmography**  
 RT eye examinations  
 eye movements  
 nystagmus  
 ophthalmology

**electro-optical effect**

RT ∞ effects  
 ∞ Kerr effects  
 light modulation

nonlinear optics

∞ optics

**electro-optical photography**

UF *electronic photography*  
 GS imagery  
 . photography  
 . . **electro-optical photography**  
 RT astronomical photography  
 black and white photography  
 image resolution  
 Lallemand cameras  
 optical measurement  
 ∞ optics  
 streak photography

*electro-optical switching*

USE **optical switching**

**electro-optics**

GS electrophysics  
 . **electro-optics**  
 RT acousto-optics  
 birefringence  
 charge injection devices  
 electrochromism  
 electroluminescence  
 electron optics  
 integrated optics  
 Kerr electrooptical effect  
 laser microscopy  
 light modulators  
 light valves  
 magneto-optics  
 optical computers  
 optical control  
 optical relay systems  
 optical switching  
 ∞ optics  
 optoelectronic devices  
 photonics  
 position sensing  
 pushbroom sensor modes  
 Stark effect  
 tunable filters

**electrophoresis**

DEF The movement of colloidal particles produced by the application of an electric potential. Used for continuous flow electrophoresis.

UF *continuous flow electrophoresis*

RT bioprocessing  
 colloids  
 electrodeposition  
 electroplating  
 ∞ microgravity applications  
 particle motion

**electrophotometers**

UF *photoelectric photometers*  
 GS measuring instruments  
 . optical measuring instruments  
 . . photometers  
 . . . **electrophotometers**  
 . radiation measuring instruments  
 . . photometers  
 . . . **electrophotometers**  
 optical equipment  
 . optical measuring instruments  
 . . photometers  
 . . . **electrophotometers**  
 RT electrophotometry

**electrophotometry**

GS chemical tests  
 . chemical analysis  
 . . **electrophotometry**  
 optical measurement  
 . photometry  
 . . **electrophotometry**  
 RT colorimetry  
 electrophotometers  
 electrophysics  
 ∞ materials tests  
 microanalysis  
 photometers  
 pixels  
 qualitative analysis  
 quantitative analysis  
 spectroscopic analysis

spectroscopy

**electrophysics**  
 GS **electrophysics**  
 . electro-optics  
 . molecular electronics  
 RT electrochemistry  
 electrokinetics  
 electromagnetism  
 ∞ electronics  
 electrophotometry  
 ∞ physics  
 ∞ science  
 theoretical physics

**electrophysiology**  
 GS physiology  
 . **electrophysiology**  
 RT body measurement (biology)  
 depolarization  
 echoencephalography  
 electrocardiography  
 electroencephalography  
 electromyography  
 electronarcosis  
 electronography  
 electroplethysmography  
 electroretinography  
 His bundle  
 information processing (biology)  
 ion channels (biology)  
 myelin sheath  
 nerve fibers  
 nervous system  
 neurology  
 ∞ science

**electroplating**  
 GS coating  
 . **electroplating**  
 coatings  
 . **electroplating**  
 deposition  
 . electrodeposition  
 . . **electroplating**  
 plating  
 . **electroplating**  
 RT baths  
 cathodic coatings  
 current density  
 electrodes  
 electroforming  
 electrolysis  
 electrolytes  
 electrolytic cells  
 electrophoresis  
 metallizing  
 nickel plate  
 protective coatings  
 surface finishing

**electroplethysmography**  
 GS bioengineering  
 . biometrics  
 . . body measurement (biology)  
 . . . **electroplethysmography**  
 . . . plethysmography  
 . . . **electroplethysmography**  
 RT blood circulation  
 electrophysiology  
 medical electronics

**electropolishing**  
 DEF The improvement in surface finish of a metal effected by making it anodic in an appropriate solution. Used for electrolytic polishing.  
 UF *electrolytic polishing*  
 GS metal finishing  
 . **electropolishing**  
 polishing  
 . metal polishing  
 . . **electropolishing**  
 RT electrochemical machining  
 metallography  
 surface finishing

**electrorefining**  
 GS refining  
 . **electrorefining**  
 RT electrodes

electrolytes  
 electrolytic cells  
 electrowinning

**electroretinography**  
 GS bioengineering  
 . biometrics  
 . . **electroretinography**  
 RT electrophysiology  
 medical electronics  
 retina

**electrorheological fluids**  
*(added June 1990)*  
 UF *ER fluids*  
 RT elastodynamics  
 electroactive polymers  
 magnetorheological fluids  
 rheology  
 smart materials

*electroseismic effect*  
 USE **electric current**  
**seismic waves**

∞ **electroslag process**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT electroslag refining  
 electroslag welding

**electroslag refining**  
 GS refining  
 . **electroslag refining**  
 RT arc melting  
 ∞ electroslag process  
 resistance heating

**electroslag welding**  
 GS welding  
 . fusion welding  
 . . electric welding  
 . . . **electroslag welding**  
 RT ∞ electroslag process

**electrostatic bonding**  
 DEF Use of the particle-attracting property of electrostatic charges to bond particles of one charge to those of the opposite charge.  
 RT binding energy  
 coverings  
 encapsulating  
 energy technology  
 glass  
 solar arrays  
 solar cells

**electrostatic charge**  
 GS electric charge  
 . **electrostatic charge**  
 RT capacitance  
 charge distribution  
 ∞ charging  
 electric discharges  
 electric fields  
 electrostatics  
 SCATHA satellite  
 static electricity  
 xerography

**electrostatic drag**  
 GS dynamic characteristics  
 . drag  
 . . **electrostatic drag**  
 RT drag measurement  
 satellite drag

**electrostatic engines**  
 DEF Electric rocket engines that use charge potential differences to accelerate propellant ions.  
 GS engines  
 . rocket engines  
 . . electric rocket engines  
 . . . **electrostatic engines**  
 . . . . ion engines  
 . . . . . cesium engines  
 . . . . . Hall thrusters  
 . . . . . mercury ion engines  
 . . . . . RIT engines

RT arc jet engines  
 microrocket engines  
 restartable rocket engines  
 sustainer rocket engines  
 Vernier engines

*electrostatic erosion*  
 USE **spark machining**

*electrostatic fields*  
 USE **electric fields**

**electrostatic generators**  
 GS electric generators  
 . direct power generators  
 . . **electrostatic generators**  
 RT arc generators  
 ∞ generators  
 klystrons  
 magnetrons  
 rotating generators  
 voltage generators

**electrostatic gyroscopes**  
 UF *electrically suspended gyroscopes*  
*ESG (gyroscopes)*  
 GS gyroscopes  
 . **electrostatic gyroscopes**  
 RT levitation

*electrostatic levitation*  
*(added February 2009)*  
 USE **magnetic suspension**

*electrostatic plasma*  
 USE **plasmas (physics)**

**electrostatic precipitators**  
 GS separators  
 . precipitators  
 . . **electrostatic precipitators**  
 RT adsorption  
 air purification  
 air sampling  
 dust collectors  
 fly ash  
 ∞ separation

**electrostatic probes**  
 UF *Langmuir probes*  
 GS measuring instruments  
 . plasma probes  
 . . **electrostatic probes**  
 . . radiation measuring instruments  
 . . **electrostatic probes**  
 RT electron energy  
 plasma frequencies  
 radiation counters  
 SCATHA satellite

**electrostatic propulsion**  
 GS propulsion  
 . electric propulsion  
 . . **electrostatic propulsion**  
 . . . ion propulsion  
 . . low thrust propulsion  
 . . **electrostatic propulsion**  
 . . . ion propulsion  
 . . spacecraft propulsion  
 . . **electrostatic propulsion**  
 . . . ion propulsion  
 RT electromagnetic propulsion  
 plasma propulsion

**electrostatic shielding**  
 GS shielding  
 . **electrostatic shielding**  
 RT electric conductors  
 SCATHA satellite

**electrostatic waves**  
 GS elastic waves  
 . magnetohydrodynamic waves  
 . . plasma waves  
 . . . **electrostatic waves**  
 RT diffusion waves  
 ionic waves  
 longitudinal waves  
 magnetoelastic waves  
 shock waves

## electrostatics

wave-particle interactions

### electrostatics

GS statics  
  . **electrostatics**  
RT Born-Infeld theory  
  electric fields  
  electromagnetic interactions  
  electromechanics  
  electrostatic charge  
  magnetostatics  
  Poisson equation  
  static electricity

### electrostriction

DEF The phenomenon wherein some dielectric materials experience an elastic strain when subjected to an electric field, this strain being independent of polarity of the field.

GS electrical properties  
  . **electrostriction**  
  mechanical properties  
  . **electrostriction**  
RT electroactive polymers  
  magnetostriction  
  piezoelectricity  
  smart materials

### electrosynthesis

(added January 2000)

USE **electrochemical synthesis**

### electrothermal engines

DEF Electric rocket engines that use electric energy to heat the propellant and add additional enthalpy.

GS engines  
  . rocket engines  
  . . electric rocket engines  
  . . . **electrothermal engines**  
  . . . . arc jet engines  
  . . . . . pulsed jet engines  
  . . . . . resistojet engines  
RT high temperature propellants  
  ion engines  
  nuclear electric propulsion  
  plasma engines  
  restartable rocket engines  
  sustainer rocket engines

### electroweak interactions (field theory)

(added April 1994)

GS particle interactions  
  . elementary particle interactions  
  . . **electroweak interactions (field theory)**  
RT electromagnetic interactions  
  electroweak model  
 $\infty$  interactions  
  standard model (particle physics)  
  weak interactions (field theory)

### electroweak model

(added April 1994)

UF *standard electroweak model*  
*Weinberg-Salam Gauge Model*  
GS field theory (physics)  
  . gauge theory  
  . . unified field theory  
  . . . **electroweak model**  
  models  
  . **electroweak model**  
RT electromagnetic interactions  
  electroweak interactions (field theory)  
  Higgs bosons  
  particle theory  
  quantum theory  
  standard model (particle physics)  
  weak interactions (field theory)

### electrowinning

DEF The production of metals by electrolysis with insoluble anodes in solutions derived from ores or other materials.

RT electrodeposition  
  electrodes  
  electrolytes  
  electrolytic cells

electrorefining

### Elektron 1 satellite

GS artificial satellites  
  . meteorological satellites  
  . . Elektron satellites  
  . . . **Elektron 1 satellite**

### Elektron 2 satellite

GS artificial satellites  
  . meteorological satellites  
  . . Elektron satellites  
  . . . **Elektron 2 satellite**

### Elektron 4 satellite

GS artificial satellites  
  . meteorological satellites  
  . . Elektron satellites  
  . . . **Elektron 4 satellite**

### Elektron satellites

GS artificial satellites  
  . meteorological satellites  
  . . **Elektron satellites**  
  . . . Elektron 1 satellite  
  . . . Elektron 2 satellite  
  . . . Elektron 4 satellite

### element abundance

USE **abundance**

### elementary excitations

UF *quasi-particles*  
GS **elementary excitations**  
  . excitons  
  . magnons  
  . phonons  
  . . phonon beams  
  . plasmons  
  . polarons  
RT many body problem

### elementary particle interactions

GS particle interactions  
  . **elementary particle interactions**  
  . . electroweak interactions (field theory)  
  . . high energy interactions  
  . . . strong interactions (field theory)  
  . . meson-meson interactions  
  . . meson-nucleon interactions  
  . . nuclear capture  
  . . . electron capture  
  . . nucleon-nucleon interactions  
  . . weak energy interactions  
  . . . weak interactions (field theory)  
  . . proton-antiproton interactions  
RT angular distribution  
  electromagnetic interactions  
 $\infty$  interactions  
  ion atom interactions  
  Mandelstam representation  
  particle decay  
  photon-electron interaction  
  transverse momentum  
  Veneziano model

### elementary particles

GS particles  
  . **elementary particles**  
  . . antiparticles  
  . . . antineutrinos  
  . . . antinucleons  
  . . . antiprotons  
  . . . positrons  
  . . beta particles  
  . . bosons  
  . . . alpha particles  
  . . . Higgs bosons  
  . . . mesons  
  . . . . eta-mesons  
  . . . . hyperons  
  . . . . . xi hyperons  
  . . . . kaons  
  . . . . meson resonance  
  . . . . . X mesons  
  . . . . muons  
  . . . . omega-mesons  
  . . . . pions  
  . . . . vector mesons  
RT atomic structure  
  bubble chambers  
  charged particles  
  de Broglie wavelengths  
  geocyclotrons  
  hypernuclei  
  instantons  
  ionizing radiation  
  neutron scattering  
  nuclear interactions  
  nuclear particles  
  nuclear radiation  
  nuclei (nuclear physics)  
  particle accelerators  
  Pomeranchuk theorem

positron annihilation  
 quantum theory  
 radiation belts  
 standard model (particle physics)

∞ **elements**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT atoms  
 chemical elements  
 hahnium  
 heavy elements  
 isoparametric finite elements  
 light elements  
 logical elements  
 neutral atoms  
 nuclear fuel elements  
 orbital elements  
 rutherfordium  
 tasks

**elevation**

RT altimetry  
 altitude  
 contours  
 digital elevation models  
 head (fluid mechanics)  
 hydrostatic pressure  
 hydrostatics  
 hypsography  
 low altitude  
 pressure heads  
 topography

**elevation angle**

UF *almucantar*  
 GS geometry  
 . Euclidean geometry  
 . . angles (geometry)  
 . . . **elevation angle**  
 RT altitude  
 azimuth  
 datum (elevation)  
 field of view  
 look angles (tracking)  
 topography

*elevations (drawings)*  
 USE **drawings**

**elevator illusion**

GS psychological effects  
 . illusions  
 . . optical illusion  
 . . . **elevator illusion**  
 RT visual perception

**elevators (control surfaces)**

GS airfoils  
 . **elevators (control surfaces)**  
 control surfaces  
 . **elevators (control surfaces)**  
 RT ailerons  
 ∞ control  
 elevons  
 horizontal tail surfaces  
 hydrofoils  
 stabilizers (fluid dynamics)  
 ∞ surfaces  
 tabs (control surfaces)  
 tail assemblies  
 tail surfaces

**elevators (lifts)**

GS **elevators (lifts)**  
 . space elevators  
 RT conveyors  
 escalators  
 ∞ jacks  
 ∞ lifts  
 winches

**elevons**

GS airfoils  
 . **elevons**  
 control surfaces  
 . **elevons**  
 RT ailerons  
 elevators (control surfaces)  
 lateral control

tabs (control surfaces)

**elimination**

GS **elimination**  
 . deletion  
 RT attenuation  
 cancellation  
 decontamination  
 depletion  
 ∞ discharge  
 disposal  
 evacuating (transportation)  
 evacuating (vacuum)  
 exclusion  
 exhaust systems  
 exhausting  
 Gaussian elimination  
 pollution  
 purification  
 ∞ reduction  
 rejection  
 ∞ separation  
 stopping  
 waste disposal

**ellipses**

DEF Plane curves constituting the locus of all points the sum of whose distances from two fixed points called foci is constant; an elongated circle.  
 GS geometry  
 . Euclidean geometry  
 . . analytic geometry  
 . . . conics  
 . . . . **ellipses**  
 RT circles (geometry)

**ellipsoids**

DEF Surfaces whose plane sections (cross sections) are all ellipses or circles, or the solid enclosed by such a surface. Used for Izsak ellipsoid.  
 UF *Izsak ellipsoid*  
 GS symmetrical bodies  
 . **ellipsoids**  
 RT bodies of revolution  
 ellipticity  
 ogives

**ellipsometers**

DEF Instruments for determining the ellipticity of polarized light. Used to measure the thickness of very thin transparent films.  
 GS measuring instruments  
 . optical measuring instruments  
 . . **ellipsometers**  
 optical equipment  
 . optical measuring instruments  
 . . **ellipsometers**  
 RT ellipsometry  
 photometers  
 polarimeters

**ellipsometry**

(added December 1989)  
 RT dimensional measurement  
 ellipsometers  
 ellipticity  
 film thickness  
 ∞ measurement  
 optical measurement  
 polarized light

**elliptic differential equations**

GS analysis (mathematics)  
 . real variables  
 . . differential equations  
 . . . partial differential equations  
 . . . . **elliptic differential equations**  
 . . . . Monge-Ampere equation  
 RT ∞ equations  
 half spaces  
 maximum principle

**elliptic functions**

UF *elliptic integrals*  
 GS analysis (mathematics)  
 . complex variables  
 . . meromorphic functions  
 . . . **elliptic functions**

functions (mathematics)  
 . meromorphic functions  
 . . **elliptic functions**  
 RT Jacobi integral  
 Weierstrass functions

*elliptic integrals*

USE **elliptic functions**

**elliptical cylinders**

RT circular cylinders  
 ∞ cylinders  
 cylindrical bodies  
 cylindrical shells

**elliptical galaxies**

GS celestial bodies  
 . galaxies  
 . . **elliptical galaxies**  
 RT disk galaxies  
 galactic clusters  
 local group (astronomy)  
 peculiar galaxies  
 Population II stars  
 ring galaxies  
 shell galaxies  
 spiral galaxies  
 star clusters  
 Virgo galactic cluster

**elliptical orbits**

UF *Hohmann trajectories*  
*Hohmann transfer orbits*  
 GS orbits  
 . **elliptical orbits**  
 . . transfer orbits  
 . . . interplanetary transfer orbits  
 RT aphelions  
 apogees  
 apsides  
 circular orbits  
 Earth orbits  
 Earth-Mars trajectories  
 Earth-Mercury trajectories  
 eccentric orbits  
 ellipticity  
 equatorial orbits  
 Euler-Lambert equation  
 low Earth orbits  
 lunar orbits  
 orbital mechanics  
 PAS  
 perigees  
 perihelions  
 planetary orbits  
 polar orbits  
 satellite orbits  
 solar orbits  
 spacecraft orbits

**elliptical plasmas**

DEF Confined non-circular plasmas.  
 GS particles  
 . charged particles  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **elliptical plasmas**  
 . corpuscular radiation  
 . . energetic particles  
 . . . plasmas (physics)  
 . . . . **elliptical plasmas**  
 RT magnetohydrodynamic stability  
 plasma control  
 toroidal plasmas

**elliptical polarization**

DEF The polarization of a wave radiated by an electric vector rotating in a plane and simultaneously varying in amplitude so as to describe an ellipse.  
 GS polarization (waves)  
 . **elliptical polarization**  
 RT circular polarization  
 magnetoionics

**ellipticity**

DEF The amount by which a spheroid differs from a circle, calculated by dividing the difference in the length of the axes by the length of the major axis.

## elongation

- GS shapes
- . **ellipticity**
- RT eccentricity
- ellipsoids
- ellipsometry
- elliptical orbits
- flattening
- oblate spheroids

### elongation

- RT angles (geometry)
- deformation
- ductility
- eccentricity
- expansion
- mechanical properties
- plastic deformation
- stretching
- superplasticity
- tensile deformation
- tensile strength

### elution

- UF *elutriation*
- RT adsorption
- extraction
- flushing
- leaching
- purification
- ∞ separation
- washing

### *elutriation*

USE **elution**

### elves

(added January 2000)

DEF Transient air glow events observed near 90 km, nearly simultaneously with a strong cloud-to-ground lightning stroke. They often precede sprites, which may occur at lower altitudes a few milliseconds later. It is believed that elves are the result of wave heating by very low frequency (VLF) radio pulses emitted by the lightning discharge current.

- GS atmospheric radiation
- . sky radiation
- . . **elves**
- electromagnetic radiation
- . light (visible radiation)
- . . sky radiation
- . . . **elves**
- RT atmospheric electricity
- atmospheric ionization
- cloud-to-ground discharges
- lightning
- sprites (atmospheric physics)
- thunderstorms

### *e-mail*

(added April 2000)

USE **electronic mail**

### *emanation*

USE **emission**

### embedded atom method

(added February 1998)

DEF A semiempirical calculation method developed by Daw and Baskes for determining the energetics of atoms in a bulk environment. The original form of the method was based on density functional theory and was intended primarily for tight-packed transition metals. More recent modifications have extended the applicability of the method to a large number of elements in the periodic table.

- UF *EAM (physical chemistry)*
- MEAM (physical chemistry)*
- modified embedded atom method*
- RT alloys
- crystal defects
- grain boundaries
- interatomic forces
- metals
- ∞ methodology
- molecular dynamics

potential energy

### embedded computer systems

DEF Computer systems physically incorporated into larger systems whose primary function is not data processing.

- GS data processing equipment
- . computers
- . . **embedded computer systems**
- . . . airborne/spaceborne computers
- RT Ada (programming language)

### embedding

- RT acceleration protection
- encapsulating
- insertion

### embolisms

DEF Large amounts of air in the blood stream which, when reaching the heart, cause it to fail; small amounts are resorbed and cause no symptoms.

- GS **embolisms**
- . aeroembolism
- . fat embolisms
- RT blood vessels
- clotting
- coagulation
- infarction

### embossing

- DEF Raising in relief on a surface.
- RT braille

### embrittlement

DEF The severe loss of ductility or toughness or both, of a material, usually a metal or alloy.

- GS **embrittlement**
- . hydrogen embrittlement
- RT brittle materials
- brittleness
- degradation
- time temperature parameter

### embryology

- RT ∞ biology
- diencephalon
- differentiation (biology)
- embryos
- fetuses
- neuroblasts
- reproduction (biology)

### embryos

- RT eggs
- embryology
- fetuses
- seeds
- zygotes

### *emerald*

USE **beryl**

### emergencies

- RT accidents
- disasters
- fail-safe systems

### emergency breathing techniques

- RT ∞ breathing
- ∞ methodology
- pressure breathing
- respirators
- resuscitation

### emergency landing

(added March 2002)

DEF Unscheduled aircraft or spacecraft landing necessitated by an unexpected problem.

- GS landing
- . **emergency landing**
- RT abort trajectories
- aircraft accidents
- aircraft landing
- aircraft safety
- crash landing
- engine failure
- flight safety
- hard landing

spacecraft landing

### emergency life sustaining systems

- GS support systems
- . life support systems
- . . **emergency life sustaining systems**
- . . . AEPS
- RT Assured Crew Return Vehicle
- environmental control
- escape capsules
- floats
- high altitude breathing
- medical equipment
- oxygen supply equipment
- portable life support systems
- pressurized cabins
- protective clothing
- safety
- safety devices
- survival equipment
- ∞ systems

### emergency locator transmitters

DEF Aircraft distress signal equipment with a radio beacon on a specific emergency frequency and used for locating downed aircraft. The set is activated by the impact of the crash.

- GS transmitters
- . **emergency locator transmitters**

### emerging

- RT emission
- emissivity
- emittance

### emission

- UF *emanation*
- GS **emission**
- . acoustic emission
- . exhaust emission
- . light emission
- . . incandescence
- . . luminescence
- . . . bioluminescence
- . . . cathode glow
- . . . cathodoluminescence
- . . . chemiluminescence
- . . . electroluminescence
- . . . fluorescence
- . . . . laser induced fluorescence
- . . . . phosphorescence
- . . . . resonance fluorescence
- . . . . x ray fluorescence
- . . . lunar luminescence
- . . . optical resonance
- . . . photoluminescence
- . . . . triboluminescence
- . . . . x ray fluorescence
- . . . shock wave luminescence
- . . . sonoluminescence
- . . . spacecraft glow
- . . . thermoluminescence
- . microwave emission
- . particle emission
- . . electron emission
- . . . field emission
- . . . photoelectric emission
- . . . secondary emission
- . . ion emission
- . . neutron emission
- . . thermionic emission
- . photoionization
- . radio emission
- . . CN emission
- . . hydroxyl emission
- . . radio bursts
- . . . solar radio bursts
- . . . . type 2 bursts
- . . . . type 3 bursts
- . . . . type 4 bursts
- . . . . type 5 bursts
- . . . solar radio emission
- . . . solar radio bursts
- . . . . type 2 bursts
- . . . . type 3 bursts
- . . . . type 4 bursts
- . . . . type 5 bursts
- . . self sustained emission
- . spectral emission

. spontaneous emission  
 . stimulated emission  
 . thermal emission  
 . . thermionic emission  
 . ultraviolet emission  
 . water masers

RT  
 airglow  
 atomic recombination  
 bursts  
 decay  
 ∞ discharge  
 efflux  
 ejection  
 emerging  
 emitters  
 excitation  
 ionizing radiation  
 irradiation  
 nuclear reactions  
 pair production  
 quantum theory  
 ∞ radiation  
 radioactive decay  
 radioactivity  
 releasing  
 selection rules (nuclear physics)  
 sputtering

**emission spectra**

SN (LIMITED TO ELECTROMAGNETIC RADIATION OF ANY WAVELENGTH EMITTED FROM EXCITED MATTER--EXCLUDES PARTICLE SPECTRA)

DEF The spectra of wavelengths and relative intensities of electromagnetic radiation emitted by a given radiator. Each radiating substance has a unique, characteristic emission spectrum, just as every medium of transmission has its individual absorption spectrum.

GS spectra  
 . radiation spectra  
 . . **emission spectra**

RT  
 absorption spectra  
 atomic recombination  
 Balmer series  
 blue shift  
 continuous radiation  
 D lines  
 electromagnetic spectra  
 electron spectroscopy  
 electronic spectra  
 flame spectroscopy  
 gamma ray spectra  
 gamma rays  
 H alpha line  
 H beta line  
 H gamma line  
 H II regions  
 H lines  
 hydroxyl emission  
 infrared spectra  
 K lines  
 laser-induced breakdown spectroscopy  
 line spectra  
 Lyman spectra  
 molecular spectra  
 molecular spectroscopy  
 nuclear radiation  
 optical emission spectroscopy  
 optical transition  
 Paschen series  
 photoluminescent bands  
 plasma spectra  
 Raman spectra  
 Rydberg series  
 Schumann-Runge bands  
 solar spectra  
 solar spectrometers  
 spectral signatures  
 spectrum analysis  
 spontaneous emission  
 stellar spectra  
 Swan bands  
 symbiotic stars  
 ultraviolet emission  
 ultraviolet spectra  
 Vegard-Kaplan bands  
 visible spectrum

x ray stars  
 x rays

**emissivity**

DEF A property of a material, measured as the emittance of a specimen of the material that is thick enough to be completely opaque and has an optically smooth surface. Used for photoemissivity.

UF *photoemissivity*  
 GS thermodynamic properties  
 . thermophysical properties

. . **emissivity**

RT  
 black body radiation  
 brightness  
 emerging  
 emittance  
 hohlraums  
 incandescence  
 luminosity  
 nongray atmospheres  
 nongray gas  
 optical measurement  
 radiance  
 radiant flux density  
 Stefan-Boltzmann law  
 surface properties  
 temperature  
 thermal emission

*emissographs*

USE **actinometers**  
**recording instruments**

**emittance**

RT  
 emerging  
 emissivity  
 flux (rate)  
 luminosity  
 luminous intensity  
 optical properties  
 radiance  
 radiant flux density  
 spectral emission  
 thermodynamic properties

**emitters**

GS **emitters**  
 . thermionic cathodes  
 . thermionic emitters

RT  
 electron emission  
 emission  
 semiconductors (materials)  
 thermophotovoltaic conversion

**emotional factors**

RT  
 angina pectoris  
 detachment  
 disorders  
 dithers  
 feedback  
 frustration  
 human reactions  
 moods  
 panic  
 phobias  
 psychological factors  
 psychology  
 sensory feedback  
 sensory stimulation

**emotions**

RT ∞  
 depression  
 fear  
 fear of flying  
 frustration  
 human behavior  
 laughing  
 moods  
 panic  
 psychological effects  
 psychology

sensory feedback

*EMP (electromagnetism)*  
 (added May 1997)

USE **electromagnetic pulses**

*empennage*

USE **tail assemblies**

**emphysema**

GS diseases  
 . respiratory diseases  
 . . **emphysema**

RT occupational diseases

**employee relations**

RT ∞  
 cooperation  
 human relations  
 personnel  
 personnel development  
 personnel management  
 position (title)  
 production management  
 retirement  
 wage surveys

**employment**

RT personnel selection  
 ∞ tests

**emptying**

RT  
 disposal  
 dumping  
 ejection  
 expulsion  
 expulsion bladders  
 jettisoning  
 materials handling  
 releasing  
 removal  
 spilling  
 spreading  
 unloading

**EMR 6050 computer**

GS data processing equipment  
 . computers  
 . . digital computers  
 . . . **EMR 6050 computer**

**emulsions**

DEF Suspensions of fine particle or globules of one or more liquids in another liquid.

GS mixtures  
 . dispersions  
 . . **emulsions**  
 . . . photographic emulsions  
 . . . nuclear emulsions

RT  
 Brownian movements  
 colloids  
 slurries  
 solutions

**enamels**

DEF Thin ceramic coatings, usually of high glass content, applied to a substrate, generally a metal.

GS coatings  
 . **enamels**  
 finishes  
 . **enamels**

RT porcelain

*enantiomeric compounds*

(added August 1998)

USE **enantiomers**

**enantiomers**

(added August 1998)

DEF Isomeric pairs whose crystalline forms or molecular structures are non-superimposable mirror images.

UF *enantiomeric compounds*  
*enantiomorphs*

GS isomers  
 . **enantiomers**

RT  
 chirality  
 crystal structure  
 isomorphism  
 molecular structure  
 stereochemistry



## encapsulated microcircuits

symmetry

*enantiomorphs*  
(added August 1998)  
USE **enantiomers**

**encapsulated microcircuits**  
DEF Microelectronic circuits enclosed in plastic.  
GS circuits  
. integrated circuits  
. . . **encapsulated microcircuits**  
RT microelectronics

**encapsulating**  
GS coating  
. **encapsulating**  
coatings  
. **encapsulating**  
RT canning  
electronic packaging  
electrostatic bonding  
embedding  
∞ imbeddings  
materials handling  
packaging  
plastic coatings  
potting compounds  
protective coatings  
sealing  
sheaths

**Enceladus**  
DEF A satellite of Saturn orbiting at a mean distance of 238,000 kilometers.  
GS celestial bodies  
. natural satellites  
. . . icy satellites  
. . . **Enceladus**  
. . . Saturn satellites  
. . . **Enceladus**  
RT Saturn (planet)

**encephalitis**  
GS diseases  
. **encephalitis**  
RT bacterial diseases  
brain  
viral diseases

**Encke comet**  
DEF A very faint comet with a periodicity of 3. 3 years which is the shortest of any known comet.  
GS celestial bodies  
. comets  
. . . **Encke comet**  
RT Comet Nucleus Tour

**Encke method**  
RT ∞ methodology

**enclosure**  
RT ∞ casing  
 housings  
 packaging

**enclosures**  
RT air locks  
asteroid capture  
∞ barriers  
biopaks  
closures  
compartments  
∞ containers  
coverings  
doghouses (electronics)  
∞ envelopes  
 housings  
∞ pens  
perforated shells  
pressure chambers  
protectors  
rooms  
safety devices  
shells (structural forms)  
shielding  
shipyards

walls

*encoders*  
USE **coders**

*encoding*  
USE **coding**

**encounters**  
RT crashes  
scattering

**end effectors**  
UF *fingers (robotics)*  
*hands (robotics)*  
*mechanical fingers*  
*mechanical hands*  
*robot fingers*  
*robot hands*  
RT ∞ effectors  
manipulators  
robot arms  
robot dynamics  
robotics  
robots  
tactile sensors (robotics)  
torque sensors (robotics)

*end moraines*  
USE **glacial drift**

**end plates**  
GS structural members  
. plates (structural members)  
. . . **end plates**  
RT anisotropic plates  
bulkheads  
circular plates  
closures  
flat plates  
shallow shell equations

**endangered species**  
DEF Living organisms (except plants) whose populations have diminished to such low levels that survival may require extraordinary conservation procedures. Changes in size and quality of the ecology are considered the cause of the possible extinction of some species.  
RT animals  
birds  
ecology  
ecosystems  
habitats  
pollution  
toxicity  
wildlife

**Endeavour (orbiter)**  
(added June 1989)  
UF *Space Shuttle Orbiter 105*  
GS manned spacecraft  
. space shuttles  
. . . Space Shuttle orbiters  
. . . **Endeavour (orbiter)**  
reentry vehicles  
. recoverable spacecraft  
. . . reusable spacecraft  
. . . space shuttles  
. . . . Space Shuttle orbiters  
. . . . **Endeavour (orbiter)**  
RT Challenger (Orbiter)  
∞ spacecraft

**endfire arrays**  
GS arrays  
. antenna arrays  
. . . linear arrays  
. . . **endfire arrays**  
. . . . Yagi antennas  
RT backfire antennas  
directional antennas

**endocrine glands**  
GS anatomy  
. glands (anatomy)  
. . . **endocrine glands**  
. . . adrenal gland  
. . . gonads  
. . . ovaries

. . . . testes  
. . . hypothalamus  
. . . pancreas  
. . . parathyroid gland  
. . . pineal gland  
. . . pituitary gland  
. . . thymus gland  
. . . thyroid gland  
RT endocrinology  
estrogens

**endocrine secretions**  
GS secretions  
. **endocrine secretions**  
. . hormones  
. . . corticosteroids  
. . . . aldosterone  
. . . . hydrocorticosteroid  
. . . . . cortisone  
. . . . . glucocorticoids  
. . . estrogens  
. . . hypertensin  
. . . pituitary hormones  
. . . . adrenocorticotropin (ACTH)  
. . . . vasopressins  
. . . prostaglandins  
. . . thyroxine  
. . insulin

**endocrine systems**  
RT endocrinology  
glands (anatomy)  
hormones  
mineral metabolism  
∞ systems

**endocrinology**  
GS medical science  
. **endocrinology**  
RT endocrine glands  
endocrine systems

**endolymph**  
GS body fluids  
. **endolymph**  
RT ear

**endoplasmic reticulum**  
GS organelles  
. **endoplasmic reticulum**  
. . sarcoplasmic reticulum  
RT cells (biology)  
cytoplasm

**endoscopes**  
UF *borescopes*  
GS medical equipment  
. **endoscopes**  
optical equipment  
. **endoscopes**  
RT inspection

**endothelium**  
GS tissues (biology)  
. **endothelium**  
RT blood vessels  
cells (biology)

**endothermic fuels**  
GS fuels  
. chemical fuels  
. . . **endothermic fuels**  
RT cryogenic rocket propellants  
double base propellants  
gaseous rocket propellants  
hydrocarbon fuels  
propellant decomposition

**endothermic reactions**  
GS chemical reactions  
. **endothermic reactions**  
RT association reactions  
exothermic reactions  
heat sinks  
pyrolysis  
thermal decomposition

**endotoxins**  
GS poisons  
. **endotoxins**

- toxins and antitoxins  
 . **endotoxins**  
 RT bacteriology  
 toxicology
- endrin**  
 GS epoxy compounds  
 . **endrin**  
 . organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . **endrin**  
 RT insecticides
- end-to-end data systems**  
 DEF Comprehensive data systems which demonstrate the processing of sensor data to the user thus reducing data fragmentation.  
 GS **end-to-end data systems**  
 . needs (data system)  
 RT ∞ data  
 data acquisition  
 data processing  
 data systems  
 ∞ systems
- ∞ **endurance**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT durability  
 fatigue (biology)  
 fatigue (materials)  
 human performance  
 human tolerances
- enemy personnel**  
 GS personnel  
 . **enemy personnel**  
 RT armed forces (foreign)
- Energetic Particle Explorer A*  
 USE **Explorer 12 satellite**
- Energetic Particle Explorer B*  
 USE **Explorer 14 satellite**
- Energetic Particle Explorer C*  
 USE **Explorer 15 satellite**
- Energetic Particle Explorer D*  
 USE **Explorer 26 satellite**
- energetic particles**  
 DEF Charged particles having energies equaling or exceeding a hundred MeV  
 GS particles  
 . charged particles  
 . . **energetic particles**  
 . . . electrons  
 . . . . conduction electrons  
 . . . . free electrons  
 . . . . high energy electrons  
 . . . . relativistic electron beams  
 . . . . hot electrons  
 . . . . N electrons  
 . . . . negatrons  
 . . . . photoelectrons  
 . . . . pi-electrons  
 . . . . polarons  
 . . . . solar electrons  
 . . . nuclei (nuclear physics)  
 . . . . alpha particles  
 . . . . deuterons  
 . . . . even-even nuclei  
 . . . . heavy nuclei  
 . . . . hypernuclei  
 . . . . odd-even nuclei  
 . . . . odd-odd nuclei  
 . . . . tritons  
 . . . plasmas (physics)  
 . . . . argon plasma  
 . . . . beta particles  
 . . . . boundary layer plasmas  
 . . . . cold plasmas  
 . . . . collisional plasmas  
 . . . . . strongly coupled plasmas  
 . . . . collisionless plasmas  
 . . . . cosmic plasma  
 . . . . cylindrical plasmas  
 . . . . dense plasmas  
 . . . . plasma focus  
 . . . . . strongly coupled plasmas  
 . . . . electron plasma  
 . . . . electron-positron plasmas  
 . . . . elliptical plasmas  
 . . . . helium plasma  
 . . . . high temperature plasmas  
 . . . . hydrogen plasma  
 . . . . . deuterium plasma  
 . . . . laser plasmas  
 . . . . metallic plasmas  
 . . . . . cesium plasma  
 . . . . . uranium plasmas  
 . . . . microplasmas  
 . . . . nitrogen plasma  
 . . . . nonequilibrium plasmas  
 . . . . nonuniform plasmas  
 . . . . oxygen plasma  
 . . . . rarefied plasmas  
 . . . . relativistic plasmas  
 . . . . rotating plasmas  
 . . . . semiconductor plasmas  
 . . . . space plasmas  
 . . . . . solar wind  
 . . . . . stellar winds  
 . . . . . dusty plasmas  
 . . . . spherical plasmas  
 . . . . thermal plasmas  
 . . . . toroidal plasmas  
 . . corpuscular radiation  
 . . **energetic particles**  
 . . . electrons  
 . . . . conduction electrons  
 . . . . free electrons  
 . . . . high energy electrons  
 . . . . . relativistic electron beams  
 . . . . hot electrons  
 . . . . N electrons  
 . . . . negatrons  
 . . . . photoelectrons  
 . . . . pi-electrons  
 . . . . polarons  
 . . . . solar electrons  
 . . . . nuclei (nuclear physics)  
 . . . . alpha particles  
 . . . . deuterons  
 . . . . even-even nuclei  
 . . . . heavy nuclei  
 . . . . hypernuclei  
 . . . . odd-even nuclei  
 . . . . odd-odd nuclei  
 . . . . tritons  
 . . . plasmas (physics)  
 . . . . argon plasma  
 . . . . beta particles  
 . . . . boundary layer plasmas  
 . . . . cold plasmas  
 . . . . collisional plasmas  
 . . . . . strongly coupled plasmas  
 . . . . collisionless plasmas  
 . . . . cosmic plasma  
 . . . . cylindrical plasmas  
 . . . . dense plasmas  
 . . . . plasma focus  
 . . . . . strongly coupled plasmas  
 . . . . electron plasma  
 . . . . electron-positron plasmas  
 . . . . elliptical plasmas  
 . . . . helium plasma  
 . . . . high temperature plasmas  
 . . . . hydrogen plasma  
 . . . . . deuterium plasma  
 . . . . laser plasmas  
 . . . . metallic plasmas  
 . . . . . cesium plasma  
 . . . . . uranium plasmas  
 . . . . microplasmas  
 . . . . nitrogen plasma  
 . . . . nonequilibrium plasmas  
 . . . . nonuniform plasmas  
 . . . . oxygen plasma  
 . . . . rarefied plasmas  
 . . . . relativistic plasmas  
 . . . . rotating plasmas  
 . . . . semiconductor plasmas  
 . . . . space plasmas  
 . . . . . solar wind  
 . . . . . stellar winds  
 . . . . . dusty plasmas  
 . . . . spherical plasmas  
 . . . . thermal plasmas  
 . . . . toroidal plasmas
- RT Advanced Composition Explorer  
 galactic cosmic rays  
 radio jets (astronomy)  
 solar cosmic rays
- Energiya launch vehicle**  
*(added April 1995)*  
 GS launch vehicles  
 . heavy lift launch vehicles  
 . . **Energiya launch vehicle**  
 RT international cooperation  
 Russian Space Program  
 space commercialization
- ∞ **energy**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF Any quantity with dimensions which can be represented as mass times length squared  
 RT activation energy  
 Bernstein energy principle  
 binding energy  
 chemical energy  
 commercial energy  
 dark energy  
 domestic energy  
 electron energy  
 energy conservation  
 energy conversion efficiency  
 energy of formation  
 enthalpy  
 entropy  
 exergy  
 flux (rate)  
 flux density  
 free energy  
 gravitational binding energy  
 heat  
 hydrogen-based energy  
 industrial energy  
 interfacial energy  
 internal energy  
 kinetic energy  
 lattice energy  
 molecular energy levels  
 nuclear binding energy  
 particle energy  
 potential energy  
 proton energy  
 radiant heating  
 seismic energy  
 solar energy  
 solar total energy systems  
 stacking fault energy  
 strain energy methods  
 surface energy  
 thermal energy  
 thermonuclear power generation  
 transportation energy  
 waterwave energy  
 work
- energy absorption**  
 UF *nonreflection*  
 GS **energy absorption**  
 . moderation (energy absorption)  
 . . thermalization (energy absorption)  
 . . . neutron thermalization  
 . . . radiation absorption  
 . . . electromagnetic absorption  
 . . . auroral absorption  
 . . . gamma ray absorption  
 . . . infrared absorption  
 . . . microwave absorption  
 . . . multiphoton absorption  
 . . . photoabsorption  
 . . . polar cap absorption  
 . . . ultraviolet absorption  
 . . . x ray absorption  
 . . molecular absorption  
 . . self absorption  
 . . thermal absorption  
 . . polar cap absorption  
 RT absorbers (materials)  
 ∞ absorption

## energy absorption films

damping  
energy conversion efficiency  
gamma ray absorptiometry  
heat sinks  
infrared radiation  
light (visible radiation)  
photon absorptiometry  
shock absorbers  
sound transmission  
vibration isolators

### energy absorption films

GS thin films  
. **energy absorption films**  
RT ∞ absorption  
aluminum oxides  
coatings  
direct power generators  
Golay detector cells  
monomolecular films  
photoelectric cells  
photothermal conversion  
selective surfaces  
semiconducting films  
thermochromic coatings

### energy bands

GS **energy bands**  
. Bloch band  
. conduction bands  
. forbidden bands  
RT ∞ bands  
electronic structure  
excitons  
laser windows  
quantum wells  
spectral bands  
windows (intervals)

### energy budgets

DEF Quantitative descriptions of the total energy exchange into and out of a given physical or ecological system; may include radiation heat, kinetic, and biological process.

GS **energy budgets**  
. Earth radiation budget  
. heat budget  
. . . atmospheric heat budget  
RT atmospheric energy sources  
∞ budgets  
exergy

### energy conservation

GS conservation  
. **energy conservation**  
RT ∞ energy  
energy policy  
exergy  
power factor controllers  
residential energy  
resource allocation  
resources  
thermochromic coatings

### energy consumption

GS consumption  
. **energy consumption**  
RT coal utilization  
commercial energy  
domestic energy  
∞ energy sources  
fuel consumption  
industrial energy

### energy conversion

DEF The change of a working substance or natural power into a more useable form of energy such as electricity or mechanical motion.

GS **energy conversion**  
. biomass energy production  
. geothermal energy conversion  
. ocean thermal energy conversion  
. satellite solar energy conversion  
. solar energy conversion  
. . . photothermal conversion  
. . . thermophotovoltaic conversion  
. . . photovoltaic conversion  
. . . thermophotovoltaic conversion  
. . . solar total energy systems  
. waterwave energy conversion

RT cogeneration  
commercial energy  
∞ conversion  
direct power generators  
domestic energy  
geothermal energy extraction  
hydrogen production  
hydrothermal systems  
industrial energy  
integrated energy systems  
laser power beaming  
lignite  
organic wastes (fuel conversion)  
power beaming  
power conditioning  
satellite solar power stations  
solar ponds (heat storage)  
solar sea power plants  
space industrialization  
transportation energy  
waste energy utilization

### energy conversion efficiency

GS efficiency  
. **energy conversion efficiency**  
RT carrier transport (solid state)  
∞ conversion  
direct power generators  
∞ energy  
energy absorption  
engines  
exergy  
fuel cells  
∞ generators  
motors  
open circuit voltage  
photothermal conversion  
power conditioning  
power factor controllers  
quantum efficiency  
Redox cells  
spectrophotovoltaics  
thermophotovoltaic conversion  
tide powered generators  
transducers  
volumetric efficiency  
waterwave energy conversion

### energy converters

USE **direct power generators**

### energy density

USE **flux density**

### energy dissipation

DEF The difference between energy input and output as a result of transfer of energy between two points. Used for energy loss.

UF **energy loss**  
GS dissipation  
. **energy dissipation**

RT dielectric loss  
exergy  
friction  
insertion loss  
Lagrange similarity hypothesis  
losses  
nonadiabatic theory  
∞ power loss  
traveling charge

### energy distribution

GS distribution (property)  
. **energy distribution**  
. . . spectral energy distribution  
RT equipartition theorem  
flux density  
force distribution  
integrated energy systems  
quantum mechanics  
statistical mechanics

### Energy Efficiency Transport program

USE **ACEE program**

### energy equipartition

USE **equipartition theorem**

### energy exchange

USE **energy transfer**

### energy gaps (solid state)

DEF A range of forbidden energies in the

band theory of solids. Used for bandgap.

UF **bandgap**  
GS gaps  
. **energy gaps (solid state)**  
RT band structure of solids  
blue shift  
electronic structure  
MODFETS  
modulation doping  
quantum well lasers  
quantum wells  
solid state  
∞ solid state physics

### energy levels

DEF Any one of different values of energy which a particle, atom, or molecule may adopt under conditions where the possible values are restricted by quantizing conditions. Used for electronic levels.

UF **electronic levels**  
GS level (quantity)  
. **energy levels**  
. . . atomic energy levels  
. . . electron states  
. . . ground state  
. . . molecular energy levels  
. . . . intermolecular forces  
. . . . rotational states  
. . . . vibrational states  
. . . yrast state

RT atomic excitations  
atomic structure  
electron tunneling  
electronic structure  
excitation  
Fermi surfaces  
molecular excitation  
nuclear capture  
nuclear models  
nuclear quadrupole resonance  
nuclear spin  
nuclear structure  
population inversion  
quantum numbers  
quantum theory

### energy loss

USE **energy dissipation**

### energy methods

GS structural analysis  
. **energy methods**  
. . . Bernstein energy principle  
. . . strain energy methods  
RT Castigliano variational theorem  
matrices (mathematics)  
∞ methodology  
stress analysis

### energy of formation

GS chemical energy  
. **energy of formation**  
RT ∞ energy  
free energy  
molecular energy levels

### energy policy

GS policies  
. **energy policy**  
RT abundance  
availability  
coal  
coal gasification  
coal liquefaction  
coal utilization  
conservation  
crude oil  
depletion  
∞ development  
Earth resources  
ecology  
economic factors  
energy conservation  
fuel oils  
fuels  
hydrocarbon fuels  
land use  
lignite  
logistics

- mining
- ∞ nuclear energy
  - nuclear fuels
  - oil exploration
  - oils
  - operating costs
  - pollution
  - refining
  - renewable energy
  - reserves
  - resource allocation
  - resources
  - safety
- energy requirements**
  - RT ∞ energy sources
  - fuel consumption
  - ∞ power supplies
- ∞ **energy sources**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT atmospheric energy sources
    - auxiliary power sources
    - biomass energy production
    - electric batteries
    - electric generators
    - electron sources
    - energy consumption
    - energy requirements
    - energy technology
    - geothermal resources
    - heat sources
    - lithium sulfur batteries
    - ocean thermal energy conversion
    - plasma power sources
    - point sources
    - propellants
    - rectifiers
    - renewable energy
    - spacecraft power supplies
    - tidepower
    - waterwave energy conversion
- energy spectra**
  - GS spectra
    - . **energy spectra**
      - . . electronic spectra
      - . . neutron spectra
  - RT absorption spectra
  - electromagnetic spectra
  - gamma ray astronomy
  - GRIST (telescope)
  - mass spectra
  - molecular spectra
  - plasma spectra
  - power spectra
  - radiation spectra
  - shock spectra
  - spectral energy distribution
  - spectrophotovoltaics
  - vibrational spectra
- energy storage**
  - UF *energy storage devices*
  - GS **energy storage**
    - . electric energy storage
    - . heat storage
    - . magnetic energy storage
  - RT capacitors
  - compressed air
  - electrets
  - electric batteries
  - flywheels
  - fuel cells
  - fuels
  - geothermal energy utilization
  - heat sources
  - inductors
  - lead acid batteries
  - nickel hydrogen batteries
  - ∞ nuclear energy
  - potential energy
  - Redox cells
  - regenerators
  - roadway powered vehicles
  - space station power supplies
  - springs (elastic)
  - ∞ storage
- superconductors (materials)
- energy storage devices*
- USE **energy storage**
- energy technology**
  - GS technologies
    - . **energy technology**
      - . . geothermal technology
  - RT biomass energy production
  - coal utilization
  - combined cycle power generation
  - Earth resources
  - electrostatic bonding
  - ∞ energy sources
    - fuel cell power plants
    - gas recovery
    - geothermal energy extraction
    - heat engines
    - hydrocarbon fuel production
    - hydrogen-based energy
    - lignite
    - magnetic energy storage
    - offshore energy sources
    - oil recovery
    - phosphoric acid fuel cells
    - photoelectrochemical devices
    - photothermal conversion
    - quantum efficiency
    - renewable energy
    - residential energy
    - solar cooling
    - solar energy conversion
    - solar houses
    - space cooling (buildings)
    - Trombe walls
    - waste heat
- energy transfer**
  - UF *energy exchange*
  - GS **energy transfer**
    - . linear energy transfer (LET)
  - RT acoustic coupling
  - antenna couplers
  - coupling circuits
  - cyclotron resonance
  - electron pumping
  - gas transport
  - gas-liquid interactions
  - heat transfer
  - Heisenberg theory
  - Lagrange similarity hypothesis
  - mass transfer
  - momentum transfer
  - nonadiabatic conditions
  - nonisothermal processes
  - nuclear pumping
  - plasma heating
  - Poynting theorem
  - radiative transfer
  - terminal ballistics
  - transferring
  - wave rotors
- engine airframe integration**
  - DEF Physics of the interface between the engine and the airframe.
  - RT aerodynamic characteristics
  - aerodynamic configurations
  - aircraft design
  - aircraft engines
  - airframes
- engine analyzers**
  - GS measuring instruments
    - . analyzers
    - . . **engine analyzers**
- engine control**
  - DEF Any control for regulating the power and speed of an engine, such as the throttle, mixture control, manifold pressure regulator, fuel pressure control, or supercharger control.
  - GS **engine control**
    - . rocket engine control
    - . turbojet engine control
  - RT air start
  - aircraft control
  - automatic control
  - combustion control
- ∞ control
  - electric control
  - flight instruments
  - fuel control
  - hydraulic control
  - manual control
  - pneumatic control
  - remote control
  - spacecraft control
  - speed control
  - temperature control
  - thrust control
  - variable stream control engines
- engine coolants**
  - DEF Liquids used in an engine cooling system to transfer heat from the engine to the radiator.
  - GS coolants
    - . **engine coolants**
  - RT cooling
  - cooling systems
- engine design**
  - GS **engine design**
    - . rocket engine design
  - RT aircraft design
  - computer aided design
    - ∞ design
      - helicopter design
      - missile design
      - nozzle design
      - product development
      - reactor design
      - spacecraft design
      - Stirling engines
      - volumetric efficiency
- engine failure**
  - GS failure
    - . **engine failure**
  - RT aborted missions
    - ∞ cut-off
    - emergency landing
    - ingestion (engines)
    - ∞ stalling
- engine inlets**
  - GS intake systems
    - . air intakes
    - . . **engine inlets**
  - RT bypass ratio
  - cavity flow
    - ∞ diffusers
    - hypersonic inlets
    - inlet airframe configurations
    - inlet nozzles
    - inlet temperature
    - internal compression inlets
    - nacelles
- engine monitoring instruments**
  - GS measuring instruments
    - . **engine monitoring instruments**
  - RT fault detection
  - flight instruments
  - systems health monitoring
- engine noise**
  - GS elastic waves
    - . sound waves
    - . . noise (sound)
    - . . . **engine noise**
      - . . . . rocket engine noise
  - RT aircraft noise
  - aircraft runup
  - jet aircraft noise
  - propeller noise
  - quiet engine program
- engine parts**
  - RT carburetors
  - clutches
  - combustion chambers
  - ∞ components
    - dump combustors
    - flywheels
    - internal combustion engines
    - pistons
    - retirement for cause

## engine primers

- rocket linings
- spare parts
- turbine blades
- turbine wheels
- valves
- wave rotors

### engine primers

- RT internal combustion engines
- ∞ primers
- starting

### engine relight (in-flight)

- USE **air start**

### engine starters

- GS starters
- . **engine starters**
- RT engines
- internal combustion engines
- jet engines

### engine testing laboratories

- GS laboratories
- . **engine testing laboratories**
- test facilities
- . **engine testing laboratories**
- RT engines

### engine tests

- GS **engine tests**
- . cold flow tests
- . prefiring tests
- . space electric rocket tests
- . static firing
- RT aircraft runup
- altitude tests
- captive tests
- flight tests
- fuel tests
- full scale tests
- ground tests
- lubricant tests
- missile tests
- nondestructive tests
- prelaunch tests
- propellant tests
- propulsive efficiency
- rocket engine design
- rocket test facilities
- SERT 1 spacecraft
- SERT 2 spacecraft
- static tests
- Stirling engines
- test firing
- test stands
- testing time
- ∞ tests
- vibration tests

### ∞ engineering

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The useful application of scientific or other systematic knowledge of the properties of matter and the sources of energy in nature.
- RT aeronautical engineering
- aerospace engineering
- aircraft production costs
- anthropometry
- bioengineering
- bioinstrumentation
- biometrics
- biotelemetry
- body measurement (biology)
- chemical engineering
- concurrent engineering
- electrical engineering
- environmental engineering
- human factors engineering
- man machine systems
- mechanical engineering
- production engineering
- reactor technology
- reliability engineering
- software engineering
- structural engineering
- systems engineering
- underwater engineering

- value engineering

### engineering development

- USE **product development**

### engineering drawings

- UF *mechanical drawings*
- GS documents
- . drawings
- . . **engineering drawings**
- . . . blueprints
- RT circuit diagrams
- descriptive geometry
- ∞ design
- dimensions
- graphic arts
- layouts
- lofting
- reproduction (copying)

### engineering management

- GS management
- . industrial management
- . . **engineering management**
- RT allocations
- ∞ budgets
- goals
- manpower
- priorities
- research management
- resource allocation
- resources

### engineering test reactors

- UF *ETR (reactors)*
- GS nuclear reactors
- . **engineering test reactors**
- RT reactor design
- reactor technology

### Engineering Test Satellites

(added October 1997)

- SN (LIMITED TO THE JAPANESE ETS SERIES OF SATELLITES)
- UF *ETS series satellites*
- GS artificial satellites
- . **Engineering Test Satellites**
- Japanese spacecraft
- . **Engineering Test Satellites**

### engineers

(added November 1992)

- GS manpower
- . **engineers**
- personnel
- . **engineers**
- RT awards
- scientists

### engines

- SN (LIMITED TO MACHINES WITH SELF-CONTAINED POWER SOURCES FOR CONTINUOUS OPERATION--SEE MOTORS FOR MACHINES UTILIZING EXTERNAL POWER SOURCES FOR NORMAL OPERATION)
- DEF Machines or apparatus that convert energy, especially heat energy, into work. Used for gas generator engines.
- UF *gas generator engines*
- GS **engines**
- . air breathing engines
- . . gas turbine engines
- . . . hydrogen engines
- . . . jet engines
- . . . T-58 engine
- . . . . ramjet engines
- . . . . . integral rocket ramjets
- . . . . . low volume ramjet engines
- . . . . . pulsejet engines
- . . . . . supersonic combustion ramjet engines
- . . . . . turboramjet engines
- . . . . turbojet engines
- . . . . Bristol-Siddeley Olympus 593 engine
- . . . . . gas generator engines
- . . . . . ducted fan engines
- . . . . . J-33 engine
- . . . . . J-34 engine
- . . . . . J-47 engine
- . . . . . J-52 engine
- . . . . . J-57 engine
- . . . . . J-58 engine
- . . . . . J-65 engine
- . . . . . J-69-T-25 engine
- . . . . . J-71 engine
- . . . . . J-73 engine
- . . . . . J-75 engine
- . . . . . J-79 engine
- . . . . . J-85 engine
- . . . . . J-93 engine
- . . . . . RA-28 engine
- . . . . . turbofan engines
- . . . . . Bristol-Siddeley BS 53 engine
- . . . . . CF-700 engine
- . . . . . convertible fan-shaft engines
- . . . . . J-97 engine
- . . . . . TF-30 engine
- . . . . . J-57 engine
- . . . . . J-58 engine
- . . . . . J-65 engine
- . . . . . J-69-T-25 engine
- . . . . . J-71 engine
- . . . . . J-73 engine
- . . . . . J-75 engine
- . . . . . J-79 engine
- . . . . . J-85 engine
- . . . . . J-93 engine
- . . . . . RA-28 engine
- . . . . . turbofan engines
- . . . . . Bristol-Siddeley BS 53 engine
- . . . . . CF-700 engine
- . . . . . convertible fan-shaft engines
- . . . . . J-97 engine
- . . . . . TF-30 engine

- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- .. helicopter engines
- .. rotary engines
- .. Wankel engines
- . JATO engines
- . Marquardt R4D engine
- . piston engines
- .. diesel engines
- .. free-piston engines
- .. Stirling engines
- . rocket engines
- .. booster rocket engines
- .. AJ-10 engine
- .. Algol engine
- .. apogee boost motors
- .. H-1 engine
- .. LR-87-AJ-5 engine
- .. M-1 engine
- .. M-55 engine
- .. MA-2 engine
- .. MA-3 engine
- .. MA-5 engine
- .. Nike booster rocket engines
- .. P-1 engine
- .. rocket engine 9K5-11000
- .. Space Shuttle Boosters
- ... Advanced Solid Rocket Motor (STS)
- ... X-405 engine
- .. ducted rocket engines
- .. electric rocket engines
- .. electrostatic engines
- .... ion engines
- .... cesium engines
- .... Hall thrusters
- .... mercury ion engines
- .... RIT engines
- .. electrothermal engines
- .... arc jet engines
- .... pulsed jet engines
- .... resistojet engines
- .. plasma engines
- .... magnetoplasmadynamic thrusters
- .... pulsed inductive thrusters
- .... pulsed plasma thrusters
- .... two stage plasma engines
- .... VASIMR (propulsion system)
- .. HEUS rocket engines
- .. hot water rocket engines
- .. hybrid propellant rocket engines
- .. lithergol rocket engines
- .. liquid propellant rocket engines
- .. AJ-10 engine
- .. F-1 rocket engine
- .. H-1 engine
- .. hydrazine engines
- .. hydrogen oxygen engines
- .... J-2 engine
- .... M-1 engine
- .... RL-10-A-1 engine
- .... RL-10-A-3 engine
- .. liquid air cycle engines
- .. LR-62-RM-2 engine
- .. LR-87-AJ-5 engine
- .. LR-91-AJ-5 engine
- .. MA-2 engine
- .. MA-3 engine
- .. MA-5 engine
- .. oxygen-hydrocarbon rocket engines
- .. RL-10 engines
- .. RL-10-A-1 engine
- .. RL-10-A-3 engine
- .. pulse detonation engines
- .. Space Shuttle Main Engine
- ... X-405 engine
- ... XLR-99 engine
- ... YLR-91-AJ-1 engine
- .. M-100 engine
- .. microrocket engines
- .. Orbit Maneuvering Engine (Space Shuttle)
- .. nozzleless rocket engines
- .. nuclear engine for rocket vehicles
- .. nuclear ramjet engines
- .. nuclear rocket engines
- .. nuclear lightbulb engines
- .. restartable rocket engines
- .. retrorocket engines
- .. BE-3 engine
- .. reusable rocket engines
- .. solid propellant rocket engines
- .. Algol engine
- .. apogee boost motors
- .. ASROC engine
- .. Hercules engine
- .. M-46 engine
- .. M-55 engine
- .. M-56 engine
- .. M-57 engine
- .. Nike booster rocket engines
- .. P-1 engine
- .. SL-3 rocket engine
- .. Space Shuttle Boosters
- ... Advanced Solid Rocket Motor (STS)
- ... SYNCOM apogee engines
- .. TX-77 engine
- .. TX-354 engine
- .. X-248 engine
- .. X-254 engine
- .. X-258 engines
- ... X-258-B1 engine
- .. X-259 engine
- .. XM-33 engine
- .. sustainer rocket engines
- .. turborocket engines
- .. ullage rocket engines
- .. upper stage rocket engines
- .. Vernier engines
- .. control rockets
- .. SYNCOM apogee engines
- .. aerospike engines
- .. rocket-based combined-cycle engines
- .. torpedo engines
- .. turborocket engines
- .. ullage rocket engines
- .. Vernier engines
- .. control rockets
- .. SYNCOM apogee engines
- .. turbine engines
- .. gas turbine engines
- .. hydrogen engines
- .. jet engines
- .. T-58 engine
- .... ramjet engines
- .... integral rocket ramjets
- .... low volume ramjet engines
- .... pulsejet engines
- .... supersonic combustion ramjet engines
- .... turboramjet engines
- .... turbojet engines
- .... Bristol-Siddeley Olympus 593 engine
- .... Bristol-Siddeley Viper engine
- .... ducted fan engines
- .... J-33 engine
- .... J-34 engine
- .... J-47 engine
- .... J-52 engine
- .... J-57 engine
- .... J-58 engine
- .... J-65 engine
- .... J-69-T-25 engine
- .... J-71 engine
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- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- RT auxiliary propulsion
- carburetors
- combustion chambers
- displacement
- energy conversion efficiency
- engine starters
- engine testing laboratories
- exhaust systems
- expendable stages (spacecraft)
- fuel consumption
- fuel systems
- geothermal energy conversion
- heat engines
- heat sources
- ignition systems
- lubrication
- ∞ machinery
- missile components
- motors
- ∞ power plants
- propulsion
- reaction products
- shutdowns
- speed regulators
- supersonic combustion
- thermodynamic efficiency
- thermodynamics
- transportation energy
- turbines
- ∞ vehicles
- England**
- GS nations
- .. United Kingdom
- .. **England**
- RT Europe
- English Channel**
- RT Atlantic Ocean
- France
- North Sea
- United Kingdom
- English language**
- GS languages
- .. **English language**
- RT speech
- words (language)
- engraving**
- RT etching
- printing
- enhanced vision**
- (added June 1995)
- UF *EVS*
- synthetic vision*
- GS vision
- .. **enhanced vision**
- RT aircraft landing
- landing aids
- multisensor applications
- night vision

## enrichment

visibility  
RT ∞ statistics

*enhancement*  
USE **augmentation**

*enlarging*  
USE **expansion**

*ENO schemes*  
USE **essentially non-oscillatory schemes**

**enrichment**  
GS **enrichment**  
. isotopic enrichment  
. jet membrane process  
RT **beneficiation**  
concentrating  
purification  
refining  
upgrading

**Enrico Fermi atomic power plant**  
GS electric power plants  
. nuclear power plants  
. . **Enrico Fermi atomic power plant**  
nuclear electric power generation  
. nuclear power plants  
. . **Enrico Fermi atomic power plant**  
RT breeder reactors  
fast nuclear reactors  
liquid metal cooled reactors  
∞ power plants

*Enskog-Chapman theory*  
USE **Chapman-Enskog theory**

**enstatite**  
GS chalcogenides  
. oxides  
. . pyroxenes  
. . . **enstatite**  
magnesium compounds  
. **enstatite**  
minerals  
. pyroxenes  
. . **enstatite**  
silicon compounds  
. silicates  
. . pyroxenes  
. . . **enstatite**  
RT chondrule  
igneous rocks  
regolith  
rocks  
soils

*enstrophy*  
USE **vorticity**

**Enterprise (Orbiter)**  
UF *Space Shuttle Orbiter 101*  
GS manned spacecraft  
. space shuttles  
. . Space Shuttle orbiters  
. . . **Enterprise (Orbiter)**  
reentry vehicles  
. recoverable spacecraft  
. . reusable spacecraft  
. . . space shuttles  
. . . . Space Shuttle orbiters  
. . . . . **Enterprise (Orbiter)**  
RT manned space flight  
∞ spacecraft

**enthalpy**  
DEF A mathematically defined thermodynamic function of state. Used for heat content.  
UF *heat content*  
GS **heat**  
. **enthalpy**  
. . Gibbs free energy  
. . heat of dissociation  
. . heat of formation  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
thermodynamic properties  
. **enthalpy**

. . Gibbs free energy  
. . heat of dissociation  
. . heat of formation  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
RT **adiabatic conditions**  
drying  
∞ energy  
entropy  
free energy  
Gibbs-Helmholtz equations  
heat measurement  
Joule-Thomson effect  
Mollier diagram  
specific heat  
thermochemistry  
thermodynamics

*enthalpy-entropy diagrams*  
USE **Mollier diagram**

**entire functions**  
UF *integral functions*  
GS analysis (mathematics)  
. complex variables  
. . analytic functions  
. . . **entire functions**  
functions (mathematics)  
. analytic functions  
. . **entire functions**

**entomology**  
RT insecticides  
insects  
∞ science  
∞ zoology

**entrainment**  
RT aeration  
aerosols  
blowing  
Coanda effect  
dispersing  
spraying  
suspending (mixing)

**entrances**  
RT curtains  
doors  
intake systems  
∞ thresholds  
transfer tunnels

**entrapment**  
RT accumulators  
confusion  
escape (abandonment)  
radiation belts  
tangling  
traps

**entropy**  
DEF A measure of the extent to which the energy of a system is unavailable.  
GS thermodynamic properties  
. **entropy**  
RT Crocco method  
∞ energy  
enthalpy  
exergy  
heat  
maximum entropy method  
Mollier diagram  
nonisentropicity  
Shannon-Wiener measure  
tephigrams  
thermochemistry  
thermodynamics

**entropy (statistics)**  
DEF A factor or quantity that is a function of a mechanical system and is equal to the logarithm of the probability of the particular arrangement in that state.  
GS **entropy (statistics)**  
. maximum entropy method  
. minimum entropy method

RT ∞ statistics

∞ **entry**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT atmospheric entry  
reentry

**entry guidance (STS)**  
DEF The precise steering commands for trajectory from initial penetration of the Earth's atmosphere until the terminal area guidance is activated at an Earth-relative speed (about 2500 fps).  
GS guidance (motion)  
. **entry guidance (STS)**  
RT atmospheric entry  
flight control  
hypersonic reentry  
pointing control systems  
space shuttles  
Space Transportation System flights  
spacecraft reentry  
terminal guidance

**enumeration**  
RT counting  
lists  
number theory

∞ **envelopes**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT coverings  
enclosures  
flight envelopes  
limits (mathematics)  
stellar envelopes

**environment effects**  
SN (EFFECTS ON ENVIRONMENT)  
GS **environment effects**  
. radiative forcing  
RT air pollution  
coastal ecology  
coastal water  
contaminants  
contamination  
debris  
deforestation  
∞ effects  
environments  
eutrophication  
exhaust gases  
greenhouse effect  
habitats  
ice environments  
man environment interactions  
marine biology  
marine environments  
metabolic wastes  
noise pollution  
poisons  
pollution  
sewage  
soil erosion  
thermal pollution  
waste disposal  
wastes  
water pollution  
water quality  
water resources  
wetlands  
wildlife

**environment management**  
GS management  
. **environment management**  
RT conservation  
Earth resources  
environmental cleanup  
environmental monitoring  
land management  
land use  
man environment interactions  
resources management  
waste management  
water management

water resources

**environment models**

- GS models
- . **environment models**
- RT atmospheric models
- climate models
- exobiology
- test chambers

**environment pollution**

DEF Alterations of the natural environment that are harmful to life; normally as produced by human activities.

- GS pollution
- . **environment pollution**
- . . air pollution
- . . . global air pollution
- . . . indoor air pollution
- . . soil pollution
- . . water pollution
- . . . oil pollution
- RT aerobiology
- aerosols
- air sampling
- biomass burning
- clean energy
- Earth resources
- environmental monitoring
- environmental surveys
- human wastes
- metabolic wastes
- noise pollution
- oil slicks
- poisons
- pollution monitoring
- pollution transport
- radioactive wastes
- thermal pollution
- waste disposal

**environment protection**

- GS protection
- . **environment protection**
- RT air pollution
- Central Atlantic Regional Ecol Test Site
- effluents
- environmental cleanup
- environmental monitoring
- planetary protection
- pollution
- radioactive wastes
- waste disposal
- water pollution

**environment simulation**

- GS simulation
- . **environment simulation**
- . . acoustic simulation
- . . altitude simulation
- . . space environment simulation
- . . thermal simulation
- . . . weightlessness simulation
- . . . . neutral buoyancy simulation
- RT atmospheric entry simulation
- atmospheric models
- environmental tests
- flight simulation
- virtual reality

**environment simulators**

- GS simulators
- . **environment simulators**
- . . Lunar Gravity Simulator
- . . solar simulators
- . . space simulators
- . . . clinostats
- . . . High Vacuum Orbital Simulator
- . . . Langley complex coordinator
- RT test chambers

*environmental chambers*

USE **test chambers**

**environmental chemistry**

DEF Collective term comprising the complex chemical relationships involving the atmosphere, climatology, air and water pollution, fu-

els, pesticides, energy, biochemistry, geochemistry, etc.

GS **environmental chemistry**

- . aerothermochemistry
- . atmospheric chemistry
- . geochemistry
- . . biogeochemistry
- . marine chemistry
- RT air pollution
- ∞ chemistry
- climatology
- hydrocarbon fuels
- pesticides
- smog
- waste disposal
- water pollution

**environmental cleanup**

(added February 1999)

- GS cleaning
- . **environmental cleanup**
- RT decontamination
- environment management
- environment protection
- hazardous wastes
- oil pollution
- oil slicks
- pollution control
- reclamation
- soil pollution
- waste disposal
- waste treatment
- water pollution
- water treatment

**environmental control**

- GS **environmental control**
- . pollution control
- RT antiseptics
- artificial gravity
- automatic control
- biosatellites
- cabin atmospheres
- clean rooms
- ∞ control
- emergency life sustaining systems
- environments
- habitability
- manned reentry
- manned spacecraft
- pressurized cabins
- resources management
- spacecraft cabin atmospheres
- spacecraft environments
- temperature control
- test chambers
- weather modification
- windshields

**environmental engineering**

- RT ∞ aerospace sciences
- clean energy
- climatology
- comfort
- ∞ engineering
- environments
- heating
- human factors engineering
- illuminating
- life sciences
- life support systems
- meteorology
- physiological effects
- psychological effects
- shelters
- space heating (buildings)
- Starsite program
- temperature control
- temperature distribution
- terraforming
- ventilation
- waste disposal
- waste management

**environmental index**

- RT physiological tests

**environmental laboratories**

- GS laboratories
- . **environmental laboratories**

test facilities

RT **environmental laboratories**

- human factors laboratories
- test chambers

**environmental monitoring**

- RT ambience
- biomarkers
- environment management
- environment pollution
- environment protection
- infrared radiometers
- meteorology
- monitors
- NOAA 19 satellite
- NPOESS
- oceanography
- Orbiting Carbon Observatory (OCO)
- water sampling
- weather forecasting

**environmental quality**

- GS quality
- . **environmental quality**
- . . air quality
- . . water quality
- RT air pollution
- contaminants
- environments
- Global Air Sampling Program
- marine biology
- noise pollution
- pollution
- thermal pollution
- water pollution

**Environmental Research Satellites**

- UF *Octahedral Research Satellites*
- GS artificial satellites
- . scientific satellites
- . . **Environmental Research Satellites**
- . . . ERS 17
- . . . ERS 18
- . . . Intasat satellite
- RT Atlas Agena launch vehicles

**environmental surveys**

- SN (LIMITED TO INDEXING ENVIRONMENTAL IMPACT STATEMENTS)
- RT aerosols
- air pollution
- Earth resources
- environment pollution
- human wastes
- metabolic wastes
- poisons
- pollution
- pollution control
- radioactive wastes
- thermal pollution
- waste disposal
- water pollution

*environmental temperature*

USE **ambient temperature**

**environmental tests**

- GS **environmental tests**
- . cold weather tests
- . corrosion tests
- . . corrosion test loops
- . . salt spray tests
- . high temperature tests
- . low temperature tests
- . underwater tests
- . . neutral buoyancy simulation
- RT ASSET project
- electronic equipment tests
- environment simulation
- field tests
- high altitude tests
- ∞ materials tests
- orbital space tests
- physiological tests
- psychological tests
- reverberation chambers
- spin tests
- test chambers
- ∞ tests



## environmental transport

thermal cycling tests  
thermal vacuum tests  
vibration tests

### environmental transport

(added March 2005)

DEF The transport of a substance through an environmental medium.

GS **environmental transport**

. pollution transport

### environments

DEF External conditions or the sum of such conditions, in which pieces of equipment, living organisms, or systems operate as in temperature environment, vibration environment, or space environment. Environments are usually specified by a range of values, and may be either natural or artificial.

GS **environments**

. aerospace environments  
. . . cislunar space  
. . . deep space  
. . . . interplanetary space  
. . . . interstellar space  
. . . Earth orbital environments  
. . . Earth environment  
. . . Earth magnetosphere  
. . . geomagnetic tail  
. . . magnetopause  
. . . magnetosheath  
. . . extraterrestrial environments  
. . . cislunar space  
. . . deep space  
. . . . interplanetary space  
. . . . interstellar space  
. . . Earth orbital environments  
. . . lunar environment  
. . . . lunar atmosphere  
. . . planetary environments  
. . . . Mars environment  
. . . . . Mars atmosphere  
. . . . planetary atmospheres  
. . . . . helium hydrogen atmospheres  
. . . . . Jupiter atmosphere  
. . . . . Mars atmosphere  
. . . . . Mercury atmosphere  
. . . . . Neptune atmosphere  
. . . . . planetary ionospheres  
. . . . . Pluto atmosphere  
. . . . . Saturn atmosphere  
. . . . . Uranus atmosphere  
. . . . . Venus atmosphere  
. . . . . . Venus clouds  
. . . . planetary magnetospheres  
. . . . . planetary magnetotails  
. . . satellite atmospheres  
. . . . lunar atmosphere  
. . . . Titan atmosphere  
. . . stellar atmospheres  
. . . . chromosphere  
. . . . solar atmosphere  
. . . . . solar transition region  
. . . frictionless environments  
. . . heterosphere  
. . . high altitude environments  
. . . high gravity environments  
. . . high temperature environments  
. . . ice environments  
. . . inner radiation belt  
. . . low temperature environments  
. . . marine environments  
. . . midlatitude atmosphere  
. . . rotating environments  
. . . spacecraft environments  
. . . thermal environments  
RT adiabatic conditions  
air  
air pollution  
air quality  
ambience  
∞ atmospheres  
coastal ecology  
coastal plains  
controlled atmospheres  
Earth atmosphere  
ecology  
economic impact  
electromagnetic interference

environment effects  
environmental control  
environmental engineering  
environmental quality  
global air pollution  
gravitation  
habitability  
habitats  
human factors engineering  
humidity  
life support systems  
nonpoint sources  
∞ performance  
physiological effects  
plants (botany)  
pressure  
programming environments  
psychological effects  
regimes  
temperature  
thermal pollution  
vacuum effects  
weightlessness

### Envisat-1 satellite

(added August 2000)

DEF Polar-orbiting Earth observation satellite designed to provide continuous global measurements including high- and medium-resolution radar and optical images from its Advanced Synthetic Aperture Radar (ASAR) and Medium-Resolution Imaging Spectrometer (MERIS). Acquired data will support Earth science research and allow monitoring of environmental and climatic changes.

GS artificial satellites

. ESA satellites  
. . **Envisat-1 satellite**  
ESA spacecraft  
. ESA satellites  
. . **Envisat-1 satellite**

RT ERS-2 (esa satellite)  
imaging spectrometers  
remote sensing  
satellite observation  
satellite-borne radar  
synthetic aperture radar

### enzyme activity

GS metabolism

. **enzyme activity**

. . fermentation  
RT bioconversion  
diabetes mellitus  
digestive system  
enzyme inhibitors  
lysosomes  
tyrosine

### enzyme inhibitors

(added August 2004)

DEF Compounds or agents that combine with an enzyme in such a manner as to prevent the normal substrate-enzyme combination and the catalytic reaction.

GS inhibitors

. **enzyme inhibitors**

RT active sites (chemistry)  
biochemistry  
catalytic activity  
enzyme activity

### enzymes

GS biopolymers

. proteins  
. . **enzymes**  
. . . aldolase  
. . . amidase  
. . . carbonic anhydrase  
. . . catalase  
. . . cholinesterase  
. . . cytochromes  
. . . dehydrogenases  
. . . hexokinase  
. . . lysozyme  
. . . nuclease  
. . . oxidase  
. . . papain  
. . . pepsin  
. . . phosphatases

. . . protease  
. . . renin  
. . . thrombin  
. . . trypsin  
organic compounds  
. proteins  
. . **enzymes**  
. . . aldolase  
. . . amidase  
. . . carbonic anhydrase  
. . . catalase  
. . . cholinesterase  
. . . cytochromes  
. . . dehydrogenases  
. . . hexokinase  
. . . lysozyme  
. . . nuclease  
. . . oxidase  
. . . papain  
. . . pepsin  
. . . phosphatases  
. . . protease  
. . . renin  
. . . thrombin  
. . . trypsin

RT activation (biology)  
catalysts  
coenzymes  
enzymology

### enzymology

GS biochemistry

. **enzymology**

RT digesting  
digestive system  
enzymes  
metabolism  
nitrogen metabolism  
phosphatases

### EOCR (reactor)

USE **experimental organic cooled reactors**

### EOGO

USE **EGO**

### EOLE satellites

GS artificial satellites  
. French satellites  
. . **EOLE satellites**  
. . meteorological satellites  
. . . **EOLE satellites**  
RT French space program  
GEOLE satellites  
geophysical satellites

### EOPAP

USE **Earth & Ocean Physics Applications Program**

### EOR (rendezvous)

USE **Earth orbital rendezvous**

### EOS

USE **Earth Observing System (EOS)**

### EOS AM-1 spacecraft

(added June 1999)

USE **Terra spacecraft**

### EOS data and information system

(added April 1995)

DEF A system to manage data resulting from NASA's Earth Observing Systems's science research satellites and field measurement programs, and other data essential for interpreting these measurements.

UF **EOSDIS**

GS information systems

. **EOS data and information system**

RT Earth Observing System (EOS)  
Earth Resources Information System  
remote sensing  
satellite observation

- scientific satellites
- EOS PM (satellite)*  
(added May 2005)  
USE **Aqua spacecraft**
- EOS-A*  
USE **Landsat E**
- EOS-B*  
USE **Landsat F**
- EOSDIS*  
USE **EOS data and information system**
- eosinophils**  
DEF A type of white blood cell or leukocyte which stains a red color with eosin stain; normally about 2 to 3 percent of white cells in the blood but tending to decrease during stressful situations and thus usable as an index for stress.  
GS cells (biology)  
. blood cells  
. . . leukocytes  
. . . **eosinophils**  
RT cytoplasm
- EPE-A*  
USE **Explorer 12 satellite**
- EPE-B*  
USE **Explorer 14 satellite**
- EPE-C*  
USE **Explorer 15 satellite**
- EPE-D*  
USE **Explorer 26 satellite**
- ephemerides**  
DEF Periodical publications tabulating the predicted positions of celestial bodies at regular intervals, such as daily, and containing other data of interest to astronomers. A publication giving similar information useful to a navigator is called an almanac.  
GS **ephemerides**  
. planet ephemerides  
RT astronomical catalogs  
celestial mechanics  
ephemeris time  
orbits  
position (location)
- ephemeris time**  
DEF The uniform measure of time defined by the laws of dynamics and determined in principle from the orbital motions of the planets, specifically, the orbital motion of the Earth as represented by Newcomb's Tables of the sun.  
GS time  
. **ephemeris time**  
RT ephemerides  
universal time
- epicardium**  
GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . heart  
. . . **epicardium**  
membranes  
. **epicardium**  
tissues (biology)  
. **epicardium**
- epicycloids**  
GS geometry  
. curves (geometry)  
. . **epicycloids**  
. Euclidean geometry  
. . analytic geometry  
. . . **epicycloids**  
RT cusps (mathematics)
- epidemiology**  
DEF The branch of medicine that studies the sources, distribution, and determinants of diseases and injuries in human populations.  
GS medical science
- . **epidemiology**  
RT infectious diseases  
vaccines  
veterinary medicine
- epidermis**  
GS anatomy  
. skin (anatomy)  
. . **epidermis**  
RT contact dermatitis
- epilepsy**  
GS diseases  
. **epilepsy**  
RT cramps  
human pathology  
shaking
- Epimetheus**  
(added July 1995)  
DEF A natural satellite of Saturn, orbiting at a mean distance of 151,422 kilometers. .  
GS celestial bodies  
. natural satellites  
. . Saturn satellites  
. . . **Epimetheus**  
RT Saturn (planet)
- epinephrine**  
DEF The active sympathomimetic hormone from the adrenal medulla in most species. It stimulates both the alpha- and beta- adrenergic systems, causes systemic vasoconstriction and gastrointestinal relaxation, stimulates the heart, and dilates bronchi and cerebral vessels. It is used in asthma and cardiac failure and to delay absorption of local anesthetics.  
UF *adrenaline*  
GS drugs  
. **epinephrine**  
organic compounds  
. amines  
. . catecholamine  
. . . **epinephrine**  
RT adrenal gland  
dopamine  
heart rate  
hormones  
neurotransmitters  
stimulants
- epitaxy**  
DEF The oriented growth of a crystalline substance on a substrate of the same or different crystalline substance.  
GS growth  
. crystal growth  
. . **epitaxy**  
. . . atomic layer epitaxy  
. . . electroepitaxy  
. . . liquid phase epitaxy  
. . . molecular beam epitaxy  
. . . vapor phase epitaxy  
RT bipolar transistors  
crystal lattices  
crystal structure  
junction transistors  
laser deposition  
pulsed laser deposition
- epithelium**  
GS tissues (biology)  
. **epithelium**  
RT anatomy  
histology  
peritoneum  
skin (anatomy)
- EPNL*  
USE **effective perceived noise levels**
- epochs*  
USE **time measurement**
- epoxidation**  
GS chemical reactions  
. **epoxidation**
- RT oxidation
- epoxides*  
USE **epoxy compounds**
- epoxy compounds**  
UF *epoxides*  
GS **epoxy compounds**  
. endrin  
. ethylene oxide  
. hyoscine  
. propylene oxide  
RT  $\infty$  chemical compounds  
ethers
- epoxy matrix composites**  
DEF High strength compositions consisting of epoxy resin and a reinforcing matrix of filaments or fibers of glass, metal, or other materials.  
GS composite materials  
. polymer matrix composites  
. . **epoxy matrix composites**  
. . . boron-epoxy composites  
. . . graphite-epoxy composites  
RT aramid fiber composites  
aramid fibers  
braided composites  
fiber orientation  
low density research  
 $\infty$  materials  
 $\infty$  matrices  
matrix materials  
pultrusion  
sandwich structures  
woven composites
- epoxy resins**  
DEF Viscous liquids or brittle solids containing epoxide groups that can be crosslinked into final form by means of a chemical reaction with a variety of setting agents used with or without heat.  
GS plastics  
. synthetic resins  
. . thermosetting resins  
. . . **epoxy resins**  
. . . . phenolic epoxy resins  
resins  
. synthetic resins  
. . thermosetting resins  
. . . **epoxy resins**  
. . . . phenolic epoxy resins  
RT adhesives  
boron reinforced materials  
boron-epoxy composites  
coatings  
glass transition temperature  
graphite-epoxy composites  
lay-up  
prepregs  
resin matrix composites
- equalizers (circuits)**  
RT attenuators  
frequency response  
phase shift  
signal processing
- $\infty$  **equations**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
UF *balance equations*  
*forced vibratory motion equations*  
RT adiabatic equations  
approximation  
Bernoulli theorem  
Bethe-Salpeter equation  
biharmonic equations  
Blasius equation  
Boltzmann transport equation  
Boltzmann-Vlasov equation  
Born approximation  
boundary layer equations  
Brillouin-Wigner equation  
Burger equation  
Cauchy-Riemann equations  
Chandrasekhar equation  
Chaplygin equation  
conservation equations

constitutive equations  
 continuity equation  
 convection-diffusion equation  
 cubic equations  
 difference equations  
 differential equations  
 diophantine equation  
 Dirac equation  
 Donnell equations  
 Duffing differential equation  
 eikonal equation  
 Einstein equations  
 Elber equation  
 elliptic differential equations  
 equations of motion  
 equations of state  
 equilibrium equations  
 Euler equations of motion  
 Euler-Cauchy equations  
 Euler-Lagrange equation  
 Euler-Lambert equation  
 Faddeev equations  
 Falkner-Skan equation  
 Ficks equation  
 flow equations  
 Fokker-Planck equation  
 Fredholm equations  
 Gauss equation  
 Gibbs adsorption equation  
 ∞ Gibbs equations  
 Gibbs-Helmholtz equations  
 Glimm method  
 Hamilton-Jacobi equation  
 ∞ Helmholtz equations  
 Helmholtz vorticity equation  
 Hugoniot equation of state  
 hydrodynamic equations  
 hyperbolic differential equations  
 identities  
 inhour equation  
 integral equations  
 kinematic equations  
 kinetic equations  
 Klein-Gordon equation  
 Korteweg-Devries equation  
 Krook equation  
 Lamé wave equations  
 Landau-Ginzburg equations  
 Laplace equation  
 linear equations  
 linear evolution equations  
 linearization  
 Liouville equations  
 macroscopic equations  
 Mathieu function  
 Maxwell equation  
 Monge-Ampere equation  
 Navier-Stokes equation  
 nonholonomic equations  
 nonlinear equations  
 nonlinear evolution equations  
 Orr-Sommerfeld equations  
 parabolic differential equations  
 partial differential equations  
 Pfaff equation  
 Poisson equation  
 polynomials  
 primitive equations  
 quadratic equations  
 quartic equations  
 Rayleigh equations  
 reaction-diffusion equations  
 Reynolds equation  
 roots of equations  
 Saha equations  
 Schroedinger equation  
 semiempirical equations  
 shallow shell equations  
 simultaneous equations  
 singular integral equations  
 Stokes-Beltrami equation  
 thermodynamics  
 vlasov equations  
 Volterra equations  
 Von Karman equation  
 vorticity equations  
 wave equations

Wiener Hopf equations

**equations of motion**

DEF A set of equations which give information regarding the motion of a body or of a point in space as a function of time when initial position and initial velocity are known. Used for motion equations.

UF *motion equations*

GS **equations of motion**

- . Euler equations of motion
- . Euler-Lagrange equation
- . kinetic equations
- . . hydrodynamic equations
- . . . Burnett equations
- . . . Helmholtz vorticity equation
- . . kinematic equations
- . Navier-Stokes equation
- . Reynolds equation

RT

- autonomy
- Bethe-Salpeter equation
- celestial mechanics
- classical mechanics
- computational fluid dynamics
- continuity equation
- control moment gyroscopes
- ∞ dynamics
- Einstein equations
- ∞ equations
- equilibrium equations
- Hamilton-Jacobi equation
- inertia principle
- kinematics
- Lissajous figures
- Mach inertia principle
- moments of inertia
- motion aftereffects
- spinning unguided rocket trajectory
- stability
- systems stability
- trajectories
- trajectory analysis
- variable mass systems
- von Zeipel method

**equations of state**

DEF Equations relating temperature, pressure, and volume of a system in thermodynamic equilibrium. Used for state equations.

UF *state equations*

GS **equations of state**

- . Hugoniot equation of state
- RT
- adiabatic equations
  - BBGKY hierarchy
  - Bose geometry
  - compressibility
  - continuity equation
  - ∞ equations
  - equilibrium equations
  - ideal fluids
  - ideal gas
  - kinetic theory
  - Mollier diagram
  - real gases
  - thermodynamics
  - virial coefficients

**equatorial atmosphere**

DEF The composition and characteristics of the Earth's atmosphere at and/or near the equator.

- RT ∞ atmospheres
- atmospheric composition
  - meteorological parameters
  - middle atmosphere
  - quasi-biennial oscillation
  - TRMM satellite
  - tropical meteorology
  - tropical regions

**equatorial electrojet**

- GS electric current
- . ionospheric currents
  - . . electrojets
  - . . . **equatorial electrojet**
  - electricity
  - . atmospheric electricity
  - . . ionospheric currents
  - . . . electrojets
  - . . . . **equatorial electrojet**

RT auroral electrojets

**equatorial orbits**

DEF Inclined orbits with an inclination of zero degrees. The plane of an equatorial orbit contains the equator of the primary body.

- GS orbits
- . **equatorial orbits**
  - . . stationary orbits
- RT
- circular orbits
  - Earth orbits
  - elliptical orbits
  - geosynchronous orbits
  - lunar orbits
  - orbital mechanics
  - planetary orbits
  - polar orbits
  - satellite orbits
  - spacecraft orbits
  - twenty-four hour orbits

**equatorial regions**

DEF Areas on or near the Earth's equator; regions between the Tropic of Cancer and the Tropic of Capricorn (23 degrees 27 minutes North or South of the Equator).

- GS regions
- . **equatorial regions**
- RT
- arid lands
  - Earth surface
  - tropical regions

**equators**

DEF The primary great circle of a sphere or spheroid, such as the Earth, perpendicular to the polar axis; or a line resembling or approximating such a circle.

- GS **equators**
- . lunar equator
  - . magnetic equator
- RT
- coordinates
  - rotating spheres
  - transequatorial propagation

∞ **equilibrium**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)

DEF A state of dynamic balance between the opposing actions, reactions, or velocities of a reversible process.

- RT
- acid base equilibrium
  - aerostatics
  - balance
  - balancing
  - body sway test
  - chemical equilibrium
  - diffusion
  - diffusion coefficient
  - dynamic characteristics
  - equilibrium equations
  - heat of dissociation
  - homeostasis
  - isostasy
  - liquid-vapor equilibrium
  - loads (forces)
  - Maxwell-Mohr method
  - nonequilibrium conditions
  - Onsager relationship
  - plasma equilibrium
  - relaxation (mechanics)
  - relaxation time
  - stability
  - stabilization
  - statics
  - steady state
  - systems stability
  - thermodynamic equilibrium
  - thermodynamic properties
  - thermodynamics
  - transition points
  - unsteady state
  - variability
  - water balance

*equilibrium diagrams*

USE **phase diagrams**

**equilibrium equations**

- RT analysis (mathematics)
- ∞ equations

- equations of motion  
equations of state  
∞ equilibrium
- equilibrium flow**  
DEF Gas flow in which energy is constant along streamlines and the composition of the gas at any point is not time dependent. Used for steady state flow.  
UF *steady state flow*  
GS fluid flow  
. gas flow  
. . . **equilibrium flow**  
. . . frozen equilibrium flow  
. . . shifting equilibrium flow  
RT Eyring theory  
heat transmission  
nonequilibrium flow  
plasma equilibrium  
quasi-steady states  
steady flow
- equilibrium methods**  
SN (LIMITED TO STRUCTURAL ANALYSIS)  
GS structural analysis  
. **equilibrium methods**  
RT matrix methods  
∞ methodology  
variational principles
- equinoxes**  
DEF One of two points of intersection of the ecliptic and the celestial equator occupied by the sun when its declination is zero degrees.  
RT seasons  
solar position  
solstices  
winter
- equipartition theorem**  
UF *energy equipartition*  
GS theorems  
. **equipartition theorem**  
RT degrees of freedom  
energy distribution  
kinetic energy  
specific heat
- ∞ **equipment**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *apparatus*  
RT abort apparatus  
absorbers (equipment)  
accumulators (computers)  
air conditioning equipment  
airborne equipment  
aircraft equipment  
airport surface detection equipment  
audio equipment  
automatic test equipment  
bedding equipment  
bombing equipment  
breathing apparatus  
communication equipment  
computer storage devices  
consoles  
cryogenic computer storage  
cryogenic equipment  
data processing equipment  
distillation equipment  
electromechanical devices  
electronic equipment  
ground support equipment  
handling equipment  
∞ hardware  
heating equipment  
hydraulic equipment  
laboratory equipment  
lighting equipment  
lunar based equipment  
lunar excavation equipment  
mechanical devices  
medical equipment  
miniature electronic equipment  
onboard equipment  
peripheral equipment (computers)  
photographic equipment  
pneumatic equipment  
portable equipment
- radar equipment  
rigging  
safety devices  
self erecting devices  
service life  
spacecraft equipment  
survival equipment  
syringes  
television equipment  
∞ test equipment  
wind tunnel apparatus  
x ray apparatus
- equipment specifications**  
GS specifications  
. **equipment specifications**  
RT aircraft production  
commonality  
∞ design  
dynamic range  
functional design specifications  
maintenance  
procurement
- equipotentials**  
GS fluid flow  
. potential flow  
. . . **equipotentials**  
RT ∞ flow graphs  
flow nets
- equivalence**  
GS mathematical logic  
. set theory  
. . . **equivalence**  
RT parity  
partitions (mathematics)
- equivalent circuits**  
GS circuits  
. **equivalent circuits**  
RT duality principle  
network analysis  
network synthesis  
superposition (mathematics)
- ER fluids*  
USE **electrorheological fluids**
- ER-2 aircraft*  
USE **U-2 aircraft**
- ERBE*  
USE **Earth radiation budget experiment**
- erbium**  
GS chemical elements  
. rare earth elements  
. . . **erbium**  
. . . erbium isotopes  
metals  
. rare earth elements  
. . . **erbium**  
. . . erbium isotopes
- erbium 169*  
USE **erbium isotopes**
- erbium 171*  
USE **erbium isotopes**
- erbium alloys**  
GS alloys  
. rare earth alloys  
. . . **erbium alloys**
- erbium compounds**  
GS rare earth compounds  
. **erbium compounds**  
RT ∞ chemical compounds  
∞ metal compounds
- erbium isotopes**  
UF *erbium 169*  
*erbium 171*  
GS chemical elements  
. nuclides  
. . . isotopes  
. . . **erbium isotopes**  
. rare earth elements  
. . . erbium
- . . . **erbium isotopes**  
metals  
. rare earth elements  
. . . erbium  
. . . **erbium isotopes**
- erection*  
USE **construction**
- EREP**  
UF *Earth Resources Experiment Package*  
GS packages  
. instrument packages  
. . . **EREP**  
RT ∞ instruments  
Skylab 1  
Skylab 2  
Skylab 3  
Skylab 4
- ergodic process**  
RT information theory  
probability theory  
stochastic processes  
thermodynamics
- ergometers**  
DEF Instruments for measuring muscular work.  
GS measuring instruments  
. **ergometers**  
RT dynamometers
- ergonomics*  
USE **human factors engineering**
- ergotamine**  
GS bases (chemical)  
. alkaloids  
. . . **ergotamine**  
drugs  
. **ergotamine**  
nitrogen compounds  
. alkaloids  
. . . **ergotamine**  
organic compounds  
. amines  
. . . **ergotamine**  
cyclic compounds  
. . . heterocyclic compounds  
. . . alkaloids  
. . . . **ergotamine**
- EROS (satellites)**  
UF *Earth Resources Observation Satellites*  
GS artificial satellites  
. **EROS (satellites)**  
RT Earth resources  
oceanography  
remote sensors  
satellite observation  
scanning  
terrain analysis
- EROS asteroid**  
(added March 1996)  
GS celestial bodies  
. asteroids  
. . . **EROS asteroid**  
RT Near Earth Asteroid Rendezvous Mission
- EROS project*  
USE **Experimental Reflector Orbital Shot Proj**
- erosion**  
DEF Progressive loss of original material from a solid surface due to mechanical interaction between that surface and a fluid, a multi-component fluid, or impinging liquid or solid particles. Used for scars (geology).  
UF *scars (geology)*  
GS **erosion**  
. rain erosion  
. soil erosion  
. water erosion  
. wind erosion

## erosive burning

RT ablation  
abrasion  
arroyos  
atmospheric effects  
cavitation corrosion  
cavitation flow  
corrosion  
degradation  
deterioration  
erosive burning  
etching  
fretting  
hot corrosion  
hydrogeology  
impingement  
inliers (landforms)  
metal surfaces  
metal-water reactions  
pitting  
plateaus  
rain impact damage  
ravines  
rivers  
soil science  
space weathering  
spark machining  
surface reactions  
tribology  
valleys  
wave resistance  
wear  
wear tests  
weathering  
wind effects

### erosive burning

DEF Combustion of solid propellants accompanied with nonsteady, high velocity flows of product gases across burning propellant surfaces.

GS combustion  
. **erosive burning**  
RT burnout  
combustion temperature  
deterioration  
erosion  
exhaust gases  
fuel combustion  
hypersonic combustion  
oxidation  
pitting  
propellant combustion  
smoldering  
solid propellant combustion  
tribology

### error analysis

GS analysis (mathematics)  
. numerical analysis  
. . **error analysis**  
RT ∞ analyzing  
∞ applications of mathematics  
backpropagation (artificial intelligence)  
bit error rate  
boresight error  
censored data (mathematics)  
fault tolerance  
ill-conditioned problems  
(mathematics)  
mean square values  
probability theory  
range errors  
Rayleigh distribution  
root-mean-square errors  
sensitivity analysis  
systematic errors

### error band

USE **accuracy**

### error correcting codes

DEF Codes in which each telegraph or data signal conforms to specific rules of construction so that departures from this construction in the received signals can be automatically detected, and permits the automatic correction, at the received terminal, of some or all of the errors. Note: Such codes require more signal elements

than are necessary to convey the basic information.

GS **error correcting codes**  
. Reed-Solomon codes  
RT automatic repeat request  
bit error rate  
∞ codes  
concatenated codes  
digital techniques  
redundancy encoding

### error correcting devices

RT BCH codes  
correction  
∞ devices  
instrument compensation  
redundancy encoding

### error detection codes

DEF Codes in which each expression conforms to specific rules of construction, so that if certain errors occur in an expression the resulting expression will not conform to the rules of construction and thus the presence of errors is detected. Note: Such codes require more signal elements than are necessary to convey the fundamental information.

RT bit error rate  
∞ codes  
coding  
computer programs  
computer systems programs  
digital techniques  
fault detection  
fault tolerance  
information theory  
parity  
proving  
quality control  
redundancy  
redundancy encoding

### error functions

GS functions (mathematics)  
. **error functions**  
RT statistical distributions

### error signals

DEF Voltages the magnitude of which are proportional to the difference between an actual and a desired position.

RT automatic repeat request  
bit error rate  
comparators  
compensators  
differential amplifiers  
discriminators  
errors  
false alarms  
loop transfer recovery  
phase error  
position errors  
range errors  
signal mixing  
∞ signals  
slewing

### errors

DEF In mathematics, the difference between the true value and a calculated or observed value. Use for invalidity.

UF *invalidity*  
GS **errors**  
. instrument errors  
. phase error  
. pilot error  
. position errors  
. . boresight error  
. random errors  
. range errors  
. root-mean-square errors  
. systematic errors  
. truncation errors  
. velocity errors

RT accuracy  
bias  
∞ compensation  
computer program integrity  
confidence  
consistency

correction  
drift (instrumentation)  
dynamic characteristics  
error signals  
hysteresis  
linearity  
malfunctions  
median (statistics)  
optical correction procedure  
precision  
quality control  
range (extremes)  
reliability  
resolution  
response bias  
∞ scaling  
∞ tests  
tolerances (mechanics)

### ERS 17

GS artificial satellites  
. scientific satellites  
. . Environmental Research Satellites  
. . . **ERS 17**  
RT Atlas Agena launch vehicles

### ERS 18

GS artificial satellites  
. scientific satellites  
. . Environmental Research Satellites  
. . . **ERS 18**  
RT Atlas Agena launch vehicles

### ERS-1 (ESA satellite)

DEF A European Space Agency remote sensing satellite designed to monitor global oceans, coastal zones and polar regions. It is scheduled for launch on an Ariane 4 expendable launch vehicle in 1990.

GS artificial satellites  
. ESA satellites  
. . **ERS-1 (ESA satellite)**  
. maritime satellites  
. . **ERS-1 (ESA satellite)**  
ESA spacecraft  
. ESA satellites  
. . **ERS-1 (ESA satellite)**  
RT European Space Agency

### ERS-2 (esa satellite)

(added February 1996)

GS artificial satellites  
. ESA satellites  
. . **ERS-2 (esa satellite)**  
ESA spacecraft  
. ESA satellites  
. . **ERS-2 (esa satellite)**  
RT Envisat-1 satellite  
European Space Agency

### ERTS

USE **Landsat satellites**

### ERTS-A

USE **Landsat 1**

### ERTS-B

USE **Landsat 2**

### ERTS-C

USE **Landsat 3**

### ERTS-D

USE **Landsat 4**

### ERTS-E

USE **Landsat E**

### ERTS-F

USE **Landsat F**

### eruptions (volcanology)

(added October 2001)

USE **volcanic eruptions**

### erythrocytes

UF *red blood cells*  
GS cells (biology)  
. blood cells  
. . **erythrocytes**  
. . . reticulocytes

RT blood cell count  
bone marrow  
carboxyhemoglobin  
hematocrit  
hematocrit ratio  
hemoglobin  
hemolysis  
leukocytes  
monocytes  
oxyhemoglobin

ES-3A aircraft  
USE **S-3 aircraft**

ESA  
USE **European Space Agency**

ESA satellites  
SN (EUROPEAN SPACE AGENCY SATELLITES)  
UF *ESRO satellites*  
*European Space Research Organization sat*

GS artificial satellites  
. **ESA satellites**  
.. Aerosat satellites  
.. COS-B satellite  
.. ERS-1 (ESA satellite)  
.. ERS-2 (esa satellite)  
.. ESRO 1 satellite  
.. ESRO 2 satellite  
.. ESRO 4 satellite  
.. European Communications Satellite  
.. Exosat satellite  
.. GEOS satellites (ESA)  
.. HEOS satellites  
.. . HEOS A satellite  
.. . HEOS B satellite  
.. Hipparcos satellite  
.. Infrared Space Observatory (ISO)  
.. L-Sat  
.. Magellan ultraviolet astronomy satellite  
.. Marecs maritime satellites  
.. Marots (ESA)  
.. METEOSAT satellite  
.. OTS (ESA)  
.. TD satellites  
.. . TD-1 satellite  
.. Envisat-1 satellite  
.. XMM-Newton telescope  
ESA spacecraft  
. **ESA satellites**  
.. Aerosat satellites  
.. COS-B satellite  
.. ERS-1 (ESA satellite)  
.. ERS-2 (esa satellite)  
.. ESRO 1 satellite  
.. ESRO 2 satellite  
.. ESRO 4 satellite  
.. European Communications Satellite  
.. Exosat satellite  
.. GEOS satellites (ESA)  
.. HEOS satellites  
.. . HEOS A satellite  
.. . HEOS B satellite  
.. Hipparcos satellite  
.. Infrared Space Observatory (ISO)  
.. L-Sat  
.. Magellan ultraviolet astronomy satellite  
.. Marecs maritime satellites  
.. Marots (ESA)  
.. METEOSAT satellite  
.. OTS (ESA)  
.. TD satellites  
.. . TD-1 satellite  
.. Envisat-1 satellite  
.. XMM-Newton telescope

RT Earthnet  
European Space Agency  
European space programs  
international cooperation  
SOHO Mission

ESA spacecraft  
DEF Spacecraft of the European Space Agency.  
GS **ESA spacecraft**

. Columbus space station  
.. ESA satellites  
.. . Aerosat satellites  
.. . COS-B satellite  
.. . ERS-1 (ESA satellite)  
.. . ERS-2 (esa satellite)  
.. . ESRO 1 satellite  
.. . ESRO 2 satellite  
.. . ESRO 4 satellite  
.. European Communications Satellite  
.. Exosat satellite  
.. GEOS satellites (ESA)  
.. HEOS satellites  
.. . HEOS A satellite  
.. . HEOS B satellite  
.. Hipparcos satellite  
.. Infrared Space Observatory (ISO)  
.. L-Sat  
.. Magellan ultraviolet astronomy satellite  
.. Marecs maritime satellites  
.. Marots (ESA)  
.. METEOSAT satellite  
.. OTS (ESA)  
.. TD satellites  
.. . TD-1 satellite  
.. Envisat-1 satellite  
.. XMM-Newton telescope  
.. Giotto mission  
.. Huygens probe  
RT ∞ spacecraft

*Esaki diodes*  
USE **tunnel diodes**

**escalators**  
RT elevators (lifts)  
ladders  
∞ lifts  
stairways

∞ **escape**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF Of a particle or larger body: to achieve an escape velocity and a flightpath outward from a primary body so as neither to fall back to the body nor to orbit it.  
RT escape (abandonment)  
escape capsules  
escape rockets  
escape systems  
escape velocity  
leakage

**escape (abandonment)**  
RT bailout  
ejection  
ejection training  
entrapment  
∞ escape  
escape rockets  
escape systems  
jettison systems  
jettisoning  
parachute descent

**escape capsules**  
GS safety devices  
. **escape capsules**  
space capsules  
. **escape capsules**  
RT abort apparatus  
aborted missions  
Assured Crew Return Vehicle  
ejection seats  
emergency life sustaining systems  
∞ escape  
flying ejection seats  
high altitude environments  
launch escape systems  
lunar escape devices  
paracone  
pressurized cabins  
X-38 crew return vehicle

**escape rockets**  
DEF Small rocket engines attached to the leading end of an escape tower, which may be

used to provide additional thrust to the capsule to obtain separation of the capsule from the booster vehicle in an emergency.  
GS safety devices  
. **escape rockets**  
RT abort apparatus  
aborted missions  
∞ escape  
escape (abandonment)  
launch escape systems  
lunar escape devices  
∞ rockets  
∞ spacecraft

**escape systems**  
GS **escape systems**  
. launch escape systems  
RT bailout  
ejection  
ejection seats  
∞ escape  
escape (abandonment)  
jettison systems  
paracone  
safety factors  
∞ systems

**escape velocity**  
DEF The radial speed which a particle or larger body must attain in order to escape from the gravitational field of a planet, satellite, or star. Used for parabolic velocity.  
UF *parabolic velocity*  
GS rates (per time)  
. **escape velocity**  
velocity  
. **escape velocity**  
RT ∞ escape  
high speed  
hyperbolic trajectories  
∞ hypervelocity  
orbital velocity  
planetary gravitation  
Schwarzschild metric  
velocity errors

**escarpments**  
DEF Long, more or less continuous cliffs or relatively steep slopes facing in one general direction, breaking the continuity of the land by separating two level or gently sloping surfaces, and produced by erosion or by faulting. Used for scarps.  
UF *scarps*  
GS landforms  
. **escarpments**  
RT cliffs  
slopes  
topography

**Escherichia**  
GS microorganisms  
. bacteria  
.. **Escherichia**

ESG (*gyroscopes*)  
USE **electrostatic gyroscopes**

*eskers*  
USE **glacial drift**

**Eskimos**  
RT anthropology  
culture (social sciences)

ESO (*observatory*)  
(*added June 1996*)  
USE **European Southern Observatory**

**esophagus**  
GS anatomy  
. digestive system  
.. **esophagus**

ESRO  
USE **European Space Agency**

ESRO 1 satellite  
GS artificial satellites  
. ESA satellites  
.. **ESRO 1 satellite**

## ESRO 2 satellite

ESA spacecraft  
. ESA satellites  
. . **ESRO 1 satellite**  
RT European Space Agency  
European space programs

### ESRO 2 satellite

GS artificial satellites  
. ESA satellites  
. . **ESRO 2 satellite**  
ESA spacecraft  
. ESA satellites  
. . **ESRO 2 satellite**  
RT European Space Agency  
European space programs

### ESRO 4 satellite

GS artificial satellites  
. ESA satellites  
. . **ESRO 4 satellite**  
ESA spacecraft  
. ESA satellites  
. . **ESRO 4 satellite**  
RT auroras  
European Space Agency  
European space programs  
particle density (concentration)  
scientific satellites

### ESRO satellites

USE **ESA satellites**

### ESSA 1 satellite

UF *OT-3*  
GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 1 satellite**  
RT Delta launch vehicle

### ESSA 2 satellite

UF *OT-2*  
GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 2 satellite**  
RT Delta launch vehicle

### ESSA 3 satellite

UF *TOS-A*  
GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 3 satellite**  
RT Delta launch vehicle

### ESSA 4 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 4 satellite**  
RT Delta launch vehicle

### ESSA 5 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 5 satellite**  
RT Delta launch vehicle

### ESSA 6 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 6 satellite**  
RT Delta launch vehicle

### ESSA 7 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 7 satellite**  
RT Delta launch vehicle

### ESSA 8 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 8 satellite**

RT Delta launch vehicle

### ESSA 9 satellite

GS artificial satellites  
. meteorological satellites  
. . ESSA satellites  
. . . **ESSA 9 satellite**  
RT Delta launch vehicle

### ESSA satellites

DEF A series of NASA and NOAA satellites launched to monitor the Earth's weather. Those funded by NASA are called TIROS, those funded by NOAA are called ESSA.

GS artificial satellites  
. meteorological satellites  
. . **ESSA satellites**  
. . . ESSA 1 satellite  
. . . ESSA 2 satellite  
. . . ESSA 3 satellite  
. . . ESSA 4 satellite  
. . . ESSA 5 satellite  
. . . ESSA 6 satellite  
. . . ESSA 7 satellite  
. . . ESSA 8 satellite  
. . . ESSA 9 satellite  
RT cloud photography  
Nimbus satellites  
satellite observation  
TIROS satellites

### essentially non-oscillatory schemes

(added September 1990)

UF *ENO schemes*  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **essentially non-oscillatory schemes**  
RT finite difference theory  
hyperbolic differential equations  
TVD schemes

### esters

GS **esters**  
. acrylates  
. alkylates  
. aspartates  
. Carbamates (tradename)  
. . urethanes  
. . carboxylates  
. chloroformate  
. cobalt acetates  
. cyanurates  
. glutamates  
. glycerides  
. isocyanates  
. . diisocyanates  
. . fulminates  
. lactates  
. lead acetates  
. maleates  
. meprobamate  
. nitrate esters  
. . isopropyl nitrate  
. . propyl nitrate  
. octoates  
. organic nitrates  
. . cellulose nitrate  
. . nitroforms  
. . . hydrazine nitroform  
. . nitroglycerin  
. . PETN  
. phthalates  
. polycarbonates  
. . Lexan (trademark)  
. polyesters  
. polyethylene terephthalate  
. sodium chlorodifluoroacetates  
. sodium salicylates  
. stearates  
. sulfonates  
. triacetin  
RT acetates  
acetyl compounds  
citrates  
cyanates  
lipids  
nitrosyls  
organic compounds

phosphatases  
plasticizers  
salicylates  
Skydrol (trademark)

### estimates

GS **estimates**  
. cost estimates  
RT allocations  
comparison  
confidence limits  
contingency  
contracts  
damage assessment  
estimating  
evaluation  
forecasting  
likelihood ratio  
management methods  
management planning  
noise prediction (aircraft)  
parameter identification  
predictions  
production management  
project planning  
quality control  
reliability  
reserves  
risk  
statistical analysis  
statistical tests  
∞ statistics  
subcontracts  
system identification  
value

### estimating

DEF A procedure for making a statistical inference about the numerical values of one or more unknown population parameters from the observed values in a sample.

GS **estimating**  
. orbital position estimation  
. parameter identification  
. system identification  
RT autoregressive moving average  
budgeting  
contracts  
costs  
counting  
critical path method  
Delphi method (forecasting)  
∞ design  
estimates  
∞ estimators  
evaluation  
feasibility  
forecasting  
∞ measurement  
mission planning  
numerical differentiation  
pattern method (forecasting)  
probe method (forecasting)  
profile method (forecasting)  
projects  
quality control  
reserves  
risk  
sampling  
standard deviation  
statistical analysis  
statistical tests  
∞ statistics  
technological forecasting  
value

### estimators

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT correlation  
cost estimates  
estimating  
parameterization  
personnel

### Estonia

GS nations  
. **Estonia**  
RT Baltic sea

Europe

**estrogens**  
 GS organic compounds  
 . lipids  
 . . steroids  
 . . . **estrogens**  
 secretions  
 . endocrine secretions  
 . . hormones  
 . . . **estrogens**  
 RT endocrine glands  
 sex glands

**estuaries**  
 DEF (A) The seaward end or the widened funnel-shaped tidal mouth of a river valley where fresh water comes into contact with seawater and where tidal effects are evident. ley due to the rise of sea level.  
 UF *outlets (geology)*  
 RT bays (topographic features)  
 Chesapeake Bay (US)  
 coasts  
 fisheries  
 geography  
 harbors  
 oceanography  
 rivers  
 tidal flats  
 tides  
 tributaries

**etalons**  
 DEF Two adjustable parallel mirrors mounted so that either one may serve as one of the mirrors in a Michelson interferometer; used to measure distance in terms of wavelengths of spectral lines.  
 GS measuring instruments  
 . interferometers  
 . . **etalons**  
 . optical measuring instruments  
 . . **etalons**  
 mirrors  
 . **etalons**  
 optical equipment  
 . optical measuring instruments  
 . . **etalons**  
 RT astronomical interferometry  
 diffractometers  
 Fabry-Perot interferometers  
 flatness  
 goniometers  
 optical measurement  
 photogoniometers  
 reflectors  
 Ronchi test  
 Sagnac effect  
 specular reflection  
 telescopes  
 very long base interferometry

**eta-mesons**  
 GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . **eta-mesons**  
 . . fermions  
 . . . **eta-mesons**  
 . . hadrons  
 . . . mesons  
 . . . . **eta-mesons**  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . **eta-mesons**  
 RT baryons  
 charged particles  
 omega-mesons  
 rho-mesons  
 sigma-mesons

**etchants**  
 RT corrosion  
 etching

**etching**  
 GS **etching**

. plasma etching  
 RT corrosion  
 engraving  
 erosion  
 etchants  
 metallography  
 photoresists  
 pitting  
 ultrasonic cleaning

**ethane**  
 GS organic compounds  
 . hydrocarbons  
 . . aliphatic hydrocarbons  
 . . . alkanes  
 . . . . **ethane**  
 RT hydrocarbon fuels

*ethane nitrile*  
 USE **acetonitrile**

*ethanol*  
 USE **ethyl alcohol**

**Ethernet**  
*(added January 2000)*  
 DEF Computer network protocol originally developed in the 1970s for local area network technology; uses carrier sense multiple access with collision detection (CSMA/CD), coaxial cable, and broadcast transmission.  
 GS protocol (computers)  
 . **Ethernet**  
 RT carrier sense multiple access  
 computer networks  
 local area networks

**ethers**  
 GS **ethers**  
 . acetals  
 . anisole  
 . diethyl ether  
 . gallamine triethiodide  
 . polyphenyl ether  
 RT anesthetics  
 drugs  
 epoxy compounds  
 organic compounds  
 PEEK  
 propargyl groups

**ethics**  
 DEF The standards of conduct and moral judgment of a group, religion, profession, etc.  
 RT ∞ methodology  
 norms  
 research

**Ethiopia**  
 GS nations  
 . **Ethiopia**  
 RT Africa

**ethnic factors**  
 DEF The complex patterns of behavior which distinguish an ethnic group.  
 GS sociology  
 . social factors  
 . . **ethnic factors**  
 RT American Indians  
 communities  
 culture (social sciences)  
 group dynamics  
 race factors

**ethoxy ethylene**  
 GS organic compounds  
 . ethylene compounds  
 . . **ethoxy ethylene**

**ethyl alcohol**  
 UF *ethanol*  
 GS hydroxyl compounds  
 . alcohols  
 . . **ethyl alcohol**  
 RT atmospheric energy sources  
 carbohydrates

**ethyl compounds**  
 RT ∞ chemical compounds  
 diethyl compounds

diethyl hydrogen phosphite (DEHP)  
 tetraethyl orthosilicate  
 triethyl compounds

**ethylene**  
 GS organic compounds  
 . hydrocarbons  
 . . aliphatic hydrocarbons  
 . . . alkenes  
 . . . . **ethylene**  
 . . . . vinylidene  
 RT hydrocarbon fuels  
 plant growth regulators  
 polyethylenes

**ethylene compounds**  
 GS organic compounds  
 . **ethylene compounds**  
 . . chloroethylene  
 . . . trichloroethylene  
 . . ethoxy ethylene  
 . . ethylene dihydrazine  
 . . ethylenediamine  
 . . ethylenediaminetetraacetic acids  
 . . succinonitrile  
 RT ∞ chemical compounds

*ethylene cyanide*  
*(added April 2004)*  
 USE **succinonitrile**

**ethylene dihydrazine**  
 GS hydrazines  
 . **ethylene dihydrazine**  
 organic compounds  
 . ethylene compounds  
 . . **ethylene dihydrazine**

**ethylene oxide**  
 GS epoxy compounds  
 . **ethylene oxide**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . **ethylene oxide**  
 RT bactericides  
 chemical sterilization  
 decontamination  
 oxides  
 spacecraft sterilization

**ethylenediamine**  
 GS organic compounds  
 . amines  
 . . diamines  
 . . . **ethylenediamine**  
 . ethylene compounds  
 . . **ethylenediamine**

**ethylenediaminetetraacetic acids**  
 UF *EDTA*  
 GS acids  
 . carboxylic acids  
 . . fatty acids  
 . . . acetic acid  
 . . . . **ethylenediaminetetraacetic acids**  
 organic compounds  
 . carboxylic acids  
 . . fatty acids  
 . . . acetic acid  
 . . . . **ethylenediaminetetraacetic acids**  
 . ethylene compounds  
 . . **ethylenediaminetetraacetic acids**  
 RT acetates  
 detergents

**etiology**  
 DEF The doctrine of causes, particularly the causes and reasons for diseases.  
 RT case histories  
 causes  
 diseases



## Ettingshausen effect

prevention

ETR (reactors)

USE **engineering test reactors**

ETS series satellites

(added October 1997)

USE **Engineering Test Satellites**

Ettingshausen coolers

USE **Ettingshausen effect thermoelectric cooling**

**Ettingshausen effect**

UF *Ettingshausen coolers*

RT cooling systems

∞ effects

temperature effects  
thermoelectric cooling  
thermoelectricity  
thermomagnetic cooling  
thermomagnetic effects

**Euclidean geometry**

UF *Euclidean space*

GS geometry  
. **Euclidean geometry**  
. . . analytic geometry  
. . . . . catenarries  
. . . . . circumferences  
. . . . . conics  
. . . . . ellipses  
. . . . . hyperbolas  
. . . . . parabolas  
. . . . . cycloids  
. . . . . epicycloids  
. . . . . loci  
. . . Mercator projection  
. . . quadrants  
. . . S curves  
. . . . . Gompertz curves  
. . . spheroids  
. . . . . oblate spheroids  
. . . . . prolate spheroids  
. . . tangents  
. . . toruses  
. . . trigonometry  
. . angles (geometry)  
. . . angle of attack  
. . . . . zero angle of attack  
. . . Bragg angle  
. . . Brewster angle  
. . . dihedral angle  
. . . elevation angle  
. . . look angles (electronics)  
. . . look angles (tracking)  
. . . sweep angle  
. . . . . sweepback  
. . . . . leading edge sweep  
. . Cartesian coordinates  
. . circles (geometry)  
. . . great circles  
. . descriptive geometry  
. . lines (geometry)  
. . . chords (geometry)  
. . . geodesic lines  
. . points (mathematics)  
. . . fixed points (mathematics)  
. . . inflection points  
. . polygons  
. . . hexagons  
. . . tetragons  
. . . . . parallelograms  
. . . . . rhomboids  
. . . . . rectangles  
. . . . . squares (mathematics)  
. . . . . trapezoids  
. . . triangles  
. . polyhedrons  
. . . cubes (mathematics)  
. . . icosahedrons  
. . . octahedrons  
. . . parallelepipeds  
. . . pyramids  
. . . rhombohedrons  
. . . tetrahedrons  
. . projective geometry  
. . . Mercator projection  
. . radii  
. . . Larmor radius

RT coordinates  
curves (geometry)  
phase-space integral  
polytopes  
Riemann manifold  
Sobolev space  
spheres

*Euclidean space*

USE **Euclidean geometry**

**audiometers**

GS measuring instruments  
. **audiometers**  
RT gas mixtures  
spark ignition

**Euglena**

GS animals  
. protozoa  
. . . Flagellata  
. . . . . **Euglena**  
microorganisms  
. protozoa  
. . . Flagellata  
. . . . . **Euglena**  
RT algae

**eukaryotes**

GS cells (biology)  
. **eukaryotes**  
RT bacteria  
biological evolution  
cytology  
molecular biology  
prokaryotes

**Euler buckling**

GS buckling  
. **Euler buckling**  
RT stress analysis

**Euler equations of motion**

GS equations of motion  
. **Euler equations of motion**  
RT ∞ equations  
Godunov method  
hydrodynamics  
moments of inertia  
primitive equations  
rigid structures  
upwind schemes (mathematics)

*Euler-Bernoulli beam theory*

(added April 1998)

USE **Euler-Bernoulli beams**

**Euler-Bernoulli beams**

(added April 1998)  
UF *Euler-Bernoulli beam theory*  
GS structural members  
. beams (supports)  
. . **Euler-Bernoulli beams**  
RT axial strain  
bending  
bending vibration  
dynamic structural analysis  
elastic properties  
mathematical models  
partial differential equations  
structural analysis  
Timoshenko beams

**Euler-Cauchy equations**

GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . . **Euler-Cauchy equations**  
RT complex variables  
conformal mapping  
∞ equations  
vector analysis

*Eulerian nutation*

USE **Chandler wobble**

**Euler-Lagrange equation**

UF *Lagrange equations of motion*  
GS equations of motion  
. **Euler-Lagrange equation**

RT calculus of variations  
Castigliano variational theorem  
classical mechanics  
∞ equations  
extremum values  
Lagrangian function

**Euler-Lambert equation**

RT elliptical orbits  
∞ equations

**Eureca (ESA)**

DEF A Space Shuttle launched retrievable autonomous space platform being developed by the European Space Agency. First launch is scheduled for 1991 with first retrieval 6 months later. Used for European Retrievable Carrier.

UF *European Retrievable Carrier*

GS space platforms  
. **Eureca (ESA)**

RT space shuttles

**Europa**

DEF A satellite of Jupiter orbiting at a mean distance of 671,000 kilometers. Also called Jupiter II.

GS celestial bodies  
. natural satellites  
. . icy satellites  
. . . **Europa**  
. . . Jupiter satellites  
. . . Galilean satellites  
. . . . . **Europa**  
RT Charon  
extraterrestrial oceans  
extraterrestrial water  
Jupiter (planet)

**Europa 1 launch vehicle**

GS launch vehicles  
. Europa launch vehicles  
. . **Europa 1 launch vehicle**

**Europa 2 launch vehicle**

GS launch vehicles  
. Europa launch vehicles  
. . **Europa 2 launch vehicle**  
RT COS-B satellite

**Europa 3 launch vehicle**

GS launch vehicles  
. Europa launch vehicles  
. . **Europa 3 launch vehicle**

**Europa 4 launch vehicle**

GS launch vehicles  
. Europa launch vehicles  
. . **Europa 4 launch vehicle**

**Europa launch vehicles**

GS launch vehicles  
. **Europa launch vehicles**  
. . Europa 1 launch vehicle  
. . Europa 2 launch vehicle  
. . Europa 3 launch vehicle  
. . Europa 4 launch vehicle  
RT Ariane launch vehicle  
Eldo launch vehicle  
European Space Agency  
European space programs  
∞ vehicles

**Europe**

GS continents  
. **Europe**  
. . Central Europe  
RT Albania  
Alps Mountains (Europe)  
Andorra  
Armenia  
Austria  
Azerbaijan  
Baltic Shield (Europe)  
Belarus  
Belgium  
Bosnia and Herzegovina  
Bulgaria  
Carpathian Mountains (Europe)  
Commonwealth of Independent States

Croatia  
 Czech Republic  
 Czechoslovakia  
 Denmark  
 East Germany  
 England  
 Estonia  
 European Union  
 Finland  
 France  
 Georgia (Eurasia)  
 Germany  
 Gibraltar  
 Greece  
 Hungary  
 Iceland  
 Italy  
 Latvia  
 Liechtenstein  
 Lithuania  
 Luxembourg  
 Middle East  
 Moldova  
 Monaco  
 nations  
 Netherlands  
 Northern Ireland  
 Norway  
 Poland  
 Portugal  
 Romania  
 Russian Federation  
 San Marino  
 Scotland  
 Serbska Republic  
 Slovakia  
 Spain  
 Sweden  
 Switzerland  
 Turkey  
 U.S.S.R.  
 Ukraine  
 United Kingdom  
 Vatican City  
 Wales  
 West Germany  
 Yugoslavia

**European 1 spacecraft**

GS artificial satellites  
 . **European 1 spacecraft**  
 RT Eldo launch vehicle

**European Airbus**

UF *Airbus*  
 GS commercial aircraft  
 . **European Airbus**  
 . . A-300 aircraft  
 . . A-310 aircraft  
 . . A-320 aircraft  
 . . A-330 aircraft  
 . . A-340 aircraft  
 . . A-380 aircraft  
 jet aircraft  
 . **European Airbus**  
 . . A-300 aircraft  
 . . A-310 aircraft  
 . . A-320 aircraft  
 . . A-330 aircraft  
 . . A-340 aircraft  
 . . A-380 aircraft  
 passenger aircraft  
 . **European Airbus**  
 . . A-300 aircraft  
 . . A-310 aircraft  
 . . A-320 aircraft  
 . . A-330 aircraft  
 . . A-340 aircraft  
 . . A-380 aircraft  
 transport aircraft  
 . **European Airbus**  
 . . A-300 aircraft  
 . . A-310 aircraft  
 . . A-320 aircraft  
 . . A-330 aircraft  
 . . A-340 aircraft  
 . . A-380 aircraft  
 RT ∞ aircraft

international cooperation

**European Communications Satellite**

UF *ECS*  
 GS artificial satellites  
 . communication satellites  
 . . **European Communications Satellite**  
 . ESA satellites  
 . . **European Communications Satellite**  
 ESA spacecraft  
 . ESA satellites  
 . . **European Communications Satellite**  
 RT European space programs  
 OTS (ESA)

*European Incoherent Scatter Radar*

USE **EISCAT radar system (Europe)**

*European Large Telecomm Satellite*

USE **L-Sat**

*European Retrievable Carrier*

USE **Eureca (ESA)**

**European Southern Observatory**

*(added June 1996)*

DEF An astronomical observatory with several telescopes at La Silla, Chile. It was established by and is jointly operated by Belgium, France, Germany, Italy, the Netherlands, Sweden, and Switzerland.

UF *ESO (observatory)*

GS observatories  
 . astronomical observatories  
 . . **European Southern Observatory**  
 RT Chile  
 international cooperation

**European Space Agency**

DEF An international organization acting on behalf of its member states (Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom).

UF *ESA*  
*ESRO*  
*European Space Research Organization*

GS organizations  
 . **European Space Agency**

RT Ariane launch vehicle  
 Cassini mission  
 Columbus module  
 Cupola Module  
 Eldo launch vehicle  
 ERS-1 (ESA satellite)  
 ERS-2 (ESA satellite)  
 ESA satellites  
 ESRO 1 satellite  
 ESRO 2 satellite  
 ESRO 4 satellite  
 Europa launch vehicles  
 European space programs  
 European Union  
 EXPOS (Spacelab payload)  
 Geosari project  
 ICL computers  
 LIRTS (telescope)  
 Marots (ESA)  
 Mars Express  
 METEOSAT satellite  
 space programs

**European space programs**

GS programs  
 . space programs  
 . . **European space programs**  
 . . . Austrian space program  
 . . . Belgian space program  
 . . . Czechoslovakian space program  
 . . . Danish space program  
 . . . Finnish space program  
 . . . French space program  
 . . . German space program  
 . . . Greek space program  
 . . . Hungarian space program  
 . . . Icelandic space program  
 . . . Italian space program

. . . Luxembourg space program  
 . . . Netherlands space program  
 . . . Norwegian space program  
 . . . Portuguese space program  
 . . . Spanish space program  
 . . . Swedish space program  
 . . . Swiss space program  
 . . . Turkish space program  
 . . . UK space program  
 RT Aerosat satellites  
 AMPTE (satellites)  
 Ariane 4 launch vehicle  
 Ariane 5 launch vehicle  
 Ariane launch vehicle  
 Azur satellite  
 Cassini mission  
 Cluster Mission  
 Committee on Space Research  
 COS-B satellite  
 DIAL satellite  
 Earthnet  
 ESA satellites  
 ESRO 1 satellite  
 ESRO 2 satellite  
 ESRO 4 satellite  
 Europa launch vehicles  
 European Communications Satellite  
 European Space Agency  
 European Union  
 Exosat satellite  
 foreign policy  
 French satellites  
 GEOS satellites (ESA)  
 HEOS satellites  
 Hipparcos satellite  
 Infrared Space Observatory (ISO)  
 International Magnetospheric Study  
 International Satellite Geodesy Experiment  
 IRIS satellites  
 man tended free flyers  
 Marecs maritime satellites  
 Mars Express  
 METEOSAT satellite  
 OTS (ESA)  
 Quasat  
 SOHO Mission  
 space missions  
 Symphonie satellites

*European Space Research Organization*

USE **European Space Agency**

*European Space Research Organization sat*

USE **ESA satellites**

**European Union**

*(added June 2005)*

RT Europe  
 European Space Agency  
 European space programs  
 federations  
 international cooperation  
 international law  
 North Atlantic Treaty Organization (NATO)  
 United Nations

**europium**

GS chemical elements  
 . rare earth elements  
 . . **europium**  
 . . . europium isotopes  
 metals  
 . rare earth elements  
 . . **europium**  
 . . . europium isotopes

**europium compounds**

GS rare earth compounds  
 . **europium compounds**  
 RT ∞ chemical compounds  
 ∞ metal compounds

**europium isotopes**

GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **europium isotopes**  
 . . . rare earth elements

## eustachian tubes

- . . europium
- . . . **europium isotopes**
- metals
- . rare earth elements
- . . europium
- . . . **europium isotopes**

### eustachian tubes

- GS anatomy
  - . sense organs
  - . . ear
  - . . . **eustachian tubes**
- RT eardrums
- ∞ tubes

### eutectic alloys

- GS alloys
  - . **eutectic alloys**
  - binary systems (materials)
  - . binary mixtures
  - . . eutectics
  - . . . **eutectic alloys**
  - mixtures
    - . binary mixtures
    - . . eutectics
    - . . . **eutectic alloys**
- RT alloying
  - bismuth alloys
  - lamella (metallurgy)
  - superplasticity
  - whisker composites

### eutectic composites

- DEF Composite materials with a metal matrix of a mixture of solids including eutectoids.
- GS composite materials
  - . metal matrix composites
  - . . **eutectic composites**
- RT alloys
  - directional solidification (crystals)
  - eutectics
  - fracture strength
- ∞ matrices
  - metals
  - mixtures
  - precipitation hardening

### eutectic diagrams

- USE **phase diagrams**

### eutectics

- GS binary systems (materials)
  - . binary mixtures
  - . . **eutectics**
  - . . . eutectic alloys
  - mixtures
    - . binary mixtures
    - . . **eutectics**
    - . . . eutectic alloys
- RT alloying
  - alloys
  - eutectic composites
  - liquid phases
  - phase diagrams
  - solid phases
  - solutions
  - syntectic alloys

### eutrophication

- DEF The process by which waters become more eutrophic; especially the artificial or natural enrichment of a lake by an influx of nutrients required for the growth of aquatic plants such as algae that are vital for fish and animal life.
- RT environment effects
  - lakes
- ∞ nutrients

### EUVE

- USE **Extreme Ultraviolet Explorer satellite**

### euxenite

- GS minerals
  - . **euxenite**
- RT niobates
  - oxides

titanates

- EVA
- USE **extravehicular activity**

### ∞ evacuating

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT evacuating (transportation)
- evacuating (vacuum)

### evacuating (transportation)

- SN (LIMITED TO CLEARANCE OF PERSONNEL, ANIMALS, OR MATERIAL FROM A GIVEN LOCALITY)
- DEF The organized withdrawal or removal of people from a place or area as a protective measure.
- RT C-9 aircraft
  - casualties
  - civil defense
  - ejection
  - elimination
- ∞ evacuating
  - hospitals
  - mobile quarantine facility
  - removal
  - transportation
  - unloading

### evacuating (vacuum)

- UF *gas evacuating*
- RT drainage
  - ejection
  - elimination
- ∞ evacuating
  - exhausting
  - gas pockets
  - purging
  - removal
  - suction
  - vacuum
  - vacuum pumps
  - venting
  - vents

### EVAL

- USE **Earth Viewing Applications Laboratory**

### evaluation

- DEF The process of determining whether an item or activity meets the specified criteria.
- GS **evaluation**
  - . training evaluation
- RT accelerated life tests
  - acceptability
- ∞ analyzing
  - approach and landing tests (STS)
  - assessments
  - certification
- ∞ classifying
  - comparison
  - computer systems performance
  - correlation
  - costs
  - criteria
  - crop identification
- ∞ discussion
  - economics
  - estimates
  - estimating
  - examination
  - feasibility
  - figure of merit
  - forecasting
- ∞ indication
  - inspection
  - management
- ∞ measurement
  - normalizing (statistics)
  - observation
- ∞ performance
  - performance prediction
  - position (title)
  - proving
  - quality
  - ranking
  - ratings
  - rejection

- reserves
- reviewing
- risk assessment
- selection
- statistical correlation
- technology assessment
- ∞ tests
  - timber identification
  - value

### evanescence

- RT evanescent waves
  - evaporation
  - surface properties
  - transpiration

### evanescent waves

- (added March 1998)
- GS surface waves
  - . **evanescent waves**
- RT acoustic impedance
  - evanescence
  - fiber optics
  - internal waves
  - plane waves
  - propagation modes
  - reflected waves
  - wave propagation
- ∞ waves

### evaporation

- DEF The physical process by which a liquid or solid is transformed into the gaseous state; the opposite of condensation.
- GS phase transformations
  - . vaporizing
  - . . **evaporation**
  - . . . evapotranspiration
  - . . . propellant evaporation
  - . . . transpiration
- RT boiling
  - concentrating
  - condensing
  - dehydration
  - diffusion
  - distillation
  - drying
  - evanescence
  - evaporative cooling
  - evaporography
  - flashing (vaporizing)
  - gas-liquid interactions
  - gas-metal interactions
  - hydrological cycle
  - liquid-vapor interfaces
  - perspiration
  - reservoirs
  - respiratory system
- ∞ separation
  - skin (anatomy)
  - sublimation
  - volatility
  - water loss

### evaporation rate

- DEF The mass of material evaporated per unit time from unit surface of a liquid or solid. The number of molecules of a given substance evaporated per second per square centimeter from the free surface of the condensed phase.
- GS rates (per time)
  - . **evaporation rate**
- RT heat transfer coefficients

### evaporative cooling

- GS cooling
  - . **evaporative cooling**
  - . . film cooling
  - . . sweat cooling
- RT capillary pumped loops
  - cooling systems
  - cryogenic fluid storage
  - evaporation
  - propellant evaporation
  - surface cooling

### evaporators

- GS heating equipment
  - . vaporizers
  - . . **evaporators**

- separators  
 . **evaporators**  
 RT air conditioning equipment  
 atomizers  
 concentrators  
 condensers (liquefiers)  
 cooling systems  
 drying apparatus  
 heat exchangers  
 refrigerating machinery
- evaporography**  
 RT evaporation  
 images  
 infrared radiation  
 photography
- evapotranspiration**  
 DEF Loss of water from a land area through transpiration of plants and evaporation from the soil and surface-water bodies. Also, the volume of water lost through evapotranspiration.  
 GS phase transformations  
 . vaporizing  
 . . evaporation  
 . . . **evapotranspiration**  
 RT transpiration  
 vadose water
- evasive actions**  
 GS maneuvers  
 . **evasive actions**  
 RT electronic warfare  
 obstacle avoidance  
 pursuit-evasion games  
 tactics  
 terrain following  
 warfare
- evasive satellites**  
 GS artificial satellites  
 . **evasive satellites**  
 maneuverable spacecraft  
 . **evasive satellites**  
 RT military spacecraft
- evection*  
 USE **lunar orbits**  
**orbit perturbation**  
**solar gravitation**
- even-even nuclei**  
 GS particles  
 . charged particles  
 . . energetic particles  
 . . . nuclei (nuclear physics)  
 . . . . **even-even nuclei**  
 . corpuscular radiation  
 . . energetic particles  
 . . . nuclei (nuclear physics)  
 . . . . **even-even nuclei**  
 RT nuclear structure  
 odd-even nuclei  
 odd-odd nuclei
- evening**  
 RT daytime  
 night  
 sunset
- event horizon**  
*(added August 1990)*  
 DEF The smallest radius of observable events around a black hole.  
 GS horizon  
 . **event horizon**  
 RT black holes (astronomy)  
 cosmology  
 gravitation theory  
 naked singularities  
 relativity  
 Schwarzschild metric  
 white holes (astronomy)
- events**  
 GS **events**  
 . consecutive events  
 RT occurrences  
 probability density functions  
 probability theory
- statistical analysis  
 statistical distributions  
 stochastic processes
- Everglades (FL)**  
 RT Florida
- evoked response (psychophysiology)**  
 RT physiological responses  
 psychophysiology
- ∞ **evolution**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT biogeny  
 chemical evolution  
 evolution (development)  
 evolution (liberation)  
 existence
- evolution (development)**  
 GS **evolution (development)**  
 . biological evolution  
 . . abiogenesis  
 . . chemical evolution  
 . galactic evolution  
 . lunar evolution  
 . planetary evolution  
 . solar system evolution  
 . stellar evolution  
 . . star formation  
 . . stellar mass accretion  
 RT ∞ biology  
 ∞ development  
 ∞ evolution  
 extinction  
 gene expression  
 genetics  
 growth  
 heredity  
 interstellar extinction  
 ontogeny  
 species diffusion
- evolution (liberation)**  
 GS **evolution (liberation)**  
 . gas evolution  
 RT boiling  
 desorption  
 ∞ evolution  
 outgassing  
 transpiration  
 vaporizing
- evolvable hardware**  
*(added September 2001)*  
 DEF Reconfigurable hardware devices that can be dynamically changed by evolutionary algorithms or other adaptive processes.  
 UF *EHW (computers)*  
 GS reconfigurable hardware  
 . **evolvable hardware**  
 RT design optimization  
 field-programmable gate arrays  
 genetic algorithms  
 ∞ hardware  
 integrated circuits  
 logic circuits  
 logic design  
 neural nets  
 self repairing devices
- EVS*  
 USE **enhanced vision**
- exactness*  
 USE **precision**
- examination**  
 GS **examination**  
 . eye examinations  
 RT acceptability  
 ∞ analyzing  
 characterization  
 clinical medicine  
 comparison  
 conical scanning  
 detection  
 diagnosis  
 ∞ discussion
- evaluation  
 exploration  
 inspection  
 investigation  
 ∞ measurement  
 observation  
 ∞ performance  
 proving  
 reviewing  
 scanning  
 ∞ tests  
 training evaluation  
 ultrasonic flaw detection
- excavation**  
 DEF The act or process of removing soil and/or rock materials from one location and transporting them to another. It includes digging, blasting, breaking, loading, and hauling, either at the surface or underground. Also, a pit, cavity, hole, or other uncovered cutting produced by excavation or the material dug out in making a channel or cavity. Used for ditching (excavation)  
 UF *ditching (excavation)*  
 GS **excavation**  
 . tunneling (excavation)  
 RT boreholes  
 construction  
 ∞ ditching  
 drainage  
 exploration  
 foundations  
 lunar excavation equipment  
 materials handling  
 mineral deposits  
 mineral exploration  
 mining  
 pits (excavations)  
 strip mining  
 underground structures
- ∞ **exchangers**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT heat exchangers
- exchanging**  
 GS **exchanging**  
 . charge exchange  
 . . resonance charge exchange  
 . gas exchange  
 . ion exchanging  
 . spin exchange  
 RT ∞ conversion  
 deionization  
 ∞ separation  
 ∞ shift  
 transferring
- excimer lasers**  
 DEF Molecular lasers using vibronic transitions whose lasing medium is a dimer that exists in the excited state and dissociates in the ground state.  
 GS stimulated emission devices  
 . lasers  
 . . gas lasers  
 . . . **excimer lasers**  
 RT electron pumping  
 fluorides  
 halogens  
 laser deposition  
 laser outputs  
 lasing  
 optical pumping  
 pulsed laser deposition  
 ∞ rare gas compounds  
 xenon chloride lasers  
 xenon fluoride lasers
- excimers**  
 DEF Molecules characterized by repulsive or very weakly bound ground electronic states.  
 RT electron orbitals  
 electron states  
 electron transitions  
 intermolecular forces  
 molecular energy levels

**excitation**

∞ rare gas compounds

**excitation**

DEF Addition of energy to a nuclear, atomic or molecular system transferring it to another energy state. Used for excited states.

UF *excited states*

GS **excitation**

- . atomic excitations
- . molecular excitation
- . photoexcitation
- . self excitation
- . wave excitation
- . . acoustic excitation
- . . harmonic excitation

RT

- activation
- actuation
- atomic energy levels
- auroral ionization
- auroral irradiation
- electromagnetic absorption
- electron states
- electron transitions
- emission
- energy levels
- frequency response
- ionization
- irradiation
- laser induced fluorescence
- metastable state
- radiation trapping
- relaxation time
- rotors
- starting
- transition probabilities

*excited states*

USE **excitation**

**excitons**

GS elementary excitations

. **excitons**

RT

- carrier mobility
- electrical insulation
- electrons
- energy bands
- holes (electron deficiencies)
- ionic crystals
- light (visible radiation)
- optical properties
- photoelectromagnetic effects
- plasmons
- positronium
- semiconductors (materials)
- spectra
- Suhl effect

**exclusion**

RT elimination

- isolation
- Pauli exclusion principle
- rejection
- ∞ separation

**excretion**

RT expulsion  
feces  
human wastes  
perspiration  
urine

*executive aircraft*

USE **general aviation aircraft**  
**passenger aircraft**

*executive systems (computers)*

USE **operating systems (computers)**

*exercise*

USE **physical exercise**

**exercise physiology**

GS physiology  
. **exercise physiology**  
RT circulatory system  
human body  
locomotion  
muscular tonus  
physical exercise  
physical fitness

physiochemistry  
physiological effects  
respiratory physiology  
sports medicine  
stress (biology)  
stress (physiology)

*exergic energy*

(added December 2000)

USE **exergy**

**exergy**

(added December 2000)

DEF The maximum amount of external-energy that could be drawn from a system or form of energy in relation to a certain reference environment. Exergy is not considered to be a form of energy but a designation of the quality of energy.

UF *exergic energy*

- RT ∞ energy
- energy budgets
- energy conservation
- energy conversion efficiency
- energy dissipation
- entropy
- power efficiency
- thermodynamic efficiency
- thermodynamic properties
- thermodynamics
- waste energy utilization

*exertion*

USE **physical work**

**exhalation**

RT alveolar air  
expired air  
respirometers

**exhaust clouds**

DEF Clouds formed from the exhaust aerosols of launch vehicle engines and boosters at liftoff. Used for ground clouds and launch clouds.

UF *ground clouds*  
*launch clouds*

RT aerosols

- ∞ clouds
- exhaust gases
- launch vehicles
- launching
- launching sites
- rocket exhaust
- rocket launching

**exhaust diffusers**

RT conical nozzles  
∞ diffusers  
ejectors  
∞ jet nozzles  
supersonic diffusers  
vaneless diffusers

**exhaust emission**

DEF The movement of gaseous or other particles and radiation from the nozzle of a rocket or other reaction engine.

GS emission

. **exhaust emission**

RT gas-gas interactions  
gas-metal interactions  
high temperature gases  
infrared radiation  
jet exhaust  
particle emission  
pollution transport  
releasing  
thermal emission  
volatile organic compounds

**exhaust flow simulation**

GS simulation  
. **exhaust flow simulation**  
RT flow distribution  
mathematical models  
wind tunnels

**exhaust gases**

UF *exhaust jets*

GS gases

. **exhaust gases**

. . flue gases

RT

air pollution

∞ blasts

- combustion efficiency
- combustion products
- dilutents
- effluents
- environment effects
- erosive burning
- exhaust clouds
- exhausting
- fumes
- gas mixtures
- gas recovery
- infrared suppression
- jet blast effects
- jet exhaust
- nozzle flow
- odors
- particulates
- pollution transport
- propulsion
- reaction products
- rocket exhaust
- smog
- smoke
- smoke abatement
- vapors
- waste disposal
- waste energy utilization
- wastes

*exhaust jets*

USE **exhaust gases**

**exhaust nozzles**

GS **exhaust nozzles**

- . convergent-divergent nozzles
- . plug nozzles
- . spike nozzles
- . turbine exhaust nozzles

RT

- air ducts
- annular nozzles
- base heating
- conical nozzles
- divergent nozzles
- ejectors
- ∞ flow
- infrared suppression
- inlet nozzles
- jet engines
- ∞ jet nozzles
- nozzle flow
- nozzle inserts
- ∞ nozzles
- openings
- outlets
- rocket engines
- skirts

**exhaust systems**

RT afterburning  
air conditioning  
air pollution  
blowers  
chimneys  
condensers (liquefiers)  
cooling systems  
ducts  
dust collectors  
ejectors  
elimination  
engines  
exhausting  
flues  
fuel tank pressurization  
intake systems  
internal combustion engines  
manifolds  
mufflers  
openings  
outlets  
pipe nozzles  
plenum chambers  
ports (openings)  
rocket exhaust  
∞ systems  
temperature control

ventilation  
ventilators  
vents  
waste disposal

**exhaust velocity**  
DEF The velocity of gases or particles (exhaust stream) that exhaust through the nozzle or a reaction engine, relative to the nozzle.  
GS rates (per time)  
. **exhaust velocity**  
velocity  
. **exhaust velocity**  
RT acoustic velocity  
critical velocity  
expulsion  
flow velocity

**exhausting**  
RT blowing  
breathing vibration  
consumption  
decontamination  
∞ discharge  
dispersing  
disposal  
dissipation  
ejection  
elimination  
evacuating (vacuum)  
exhaust gases  
exhaust systems  
relieving  
removal  
ventilation  
venting

**exhaustion**  
RT consumption  
depletion  
fatigue (biology)  
hyperkinesia

**existence**  
RT cosmology  
∞ evolution  
life span  
validity

**existence theorems**  
GS analysis (mathematics)  
. real variables  
. . . **existence theorems**  
theorems  
. **existence theorems**  
RT problem solving  
roots of equations

*exits (doors)*  
USE **doors**

**exobiology**  
DEF Field of biology that deals with the search for extraterrestrial life and the conditions that may give rise to life on other planets or elsewhere in the Universe. May also be defined to include the study of effects of extraterrestrial environments on living organisms. Used for astrobiology and space biology.  
UF *astrobiology*  
*space biology*  
RT aerospace environments  
Apollo extension system  
bioastronautics  
∞ biology  
biomarkers  
carbonaceous meteorites  
chemical evolution  
environment models  
extraterrestrial life  
extraterrestrial water  
life support systems  
lunar environment  
Mars Pathfinder  
panspermia  
planetary environments  
planetary protection  
spacecraft contamination  
spacecraft environments  
spacecraft sterilization

terraforming

*exophoria*  
USE **heterophoria**

*exoplanet detection*  
(added January 2003)  
USE **planet detection**

*exoplanets*  
(added April 2001)  
USE **extrasolar planets**

**EXOS satellites**  
GS artificial satellites  
. scientific satellites  
. . . **EXOS satellites**  
. . . EXOS-A satellite  
. . . EXOS-B satellite  
. . . EXOS-C satellite  
. . . EXOS-D satellite  
Japanese spacecraft  
. **EXOS satellites**  
. . EXOS-A satellite  
. . EXOS-B satellite  
. . EXOS-C satellite  
. . EXOS-D satellite

**EXOS sounding rocket**  
GS rocket vehicles  
. multistage rocket vehicles  
. . . **EXOS sounding rocket**  
. . . sounding rockets  
. . . **EXOS sounding rocket**  
RT Honest John rocket vehicle  
Nike-Ajax missile  
solid propellant rocket engines  
XM-33 engine

**EXOS-A satellite**  
(added February 1992)  
UF *Kyokko satellite*  
GS artificial satellites  
. scientific satellites  
. . EXOS satellites  
. . . **EXOS-A satellite**  
Japanese spacecraft  
. EXOS satellites  
. . **EXOS-A satellite**

**Exosat satellite**  
UF *HELOS (satellite)*  
*High Eccentric Lunar Occultation Satellite*  
GS artificial satellites  
. ESA satellites  
. . **Exosat satellite**  
. . scientific satellites  
. . **Exosat satellite**  
ESA spacecraft  
. ESA satellites  
. . **Exosat satellite**  
RT eccentric orbits  
European space programs  
lunar occultation  
x ray astronomy  
x ray sources

**EXOS-B satellite**  
UF *Jikiken satellite*  
GS artificial satellites  
. scientific satellites  
. . EXOS satellites  
. . . **EXOS-B satellite**  
Japanese spacecraft  
. EXOS satellites  
. . **EXOS-B satellite**

**EXOS-C satellite**  
UF *Ohzora satellite*  
GS artificial satellites  
. scientific satellites  
. . EXOS satellites  
. . . **EXOS-C satellite**  
Japanese spacecraft  
. EXOS satellites  
. . **EXOS-C satellite**

**EXOS-D satellite**  
(added February 1992)

UF *Akebono satellite*  
GS artificial satellites  
. scientific satellites  
. . EXOS satellites  
. . . **EXOS-D satellite**  
Japanese spacecraft  
. EXOS satellites  
. . **EXOS-D satellite**

**exoskeletons**  
RT anatomy  
arthropods  
body composition (biology)  
bones  
connective tissue  
musculoskeletal system

*exosolar planets*  
(added April 2001)  
USE **extrasolar planets**

**exosphere**  
SN (ALTITUDES ABOVE APPROXIMATELY 500 KM)  
DEF The outermost, or topmost, portion of the atmosphere. Its lower boundary is the critical level of escape, variously estimated at 500 to 1000 kilometers above the Earth's surface.  
GS Earth atmosphere  
. upper atmosphere  
. . **exosphere**  
RT Earth ionosphere  
Earth magnetosphere  
heterosphere  
planetary magnetotails  
radiation belts  
thermosphere

**exothermic reactions**  
GS chemical reactions  
. **exothermic reactions**  
RT association reactions  
combustion  
combustion chemistry  
combustion synthesis  
endothermic reactions  
incendiary ammunition  
pyrolysis  
thermal decomposition

**expandable structures**  
GS **expandable structures**  
. bellows  
. inflatable structures  
. . air bag restraint devices  
. . balloons  
. . . high altitude balloons  
. . . . jimsphere balloons  
. . . . skyhook balloons  
. . . . superpressure balloons  
. . . meteorological balloons  
. . . . jimsphere balloons  
. . . . ROBIN balloons  
. . . microballoons  
. . . tethered balloons  
. . ballutes  
. . gas bags  
. . inflatable gliders  
. . inflatable spacecraft  
. . . Beacon satellites  
. . . . Beacon Explorer A  
. . . . Explorer 22 satellite  
RT expulsion bladders  
folding structures  
large space structures  
orbital assembly  
space erectable structures  
∞ spacecraft  
∞ structures  
variable geometry structures

**expansion**  
UF *enlarging*  
GS **expansion**  
. gas expansion  
. Karhunen-Loeve expansion  
. Prandtl-Meyer expansion  
. series expansion  
. thermal expansion  
RT adiabatic conditions

## expectancy hypothesis

- distortion
- elongation
- extensions
- inflating
- rarefaction
- relaxation (mechanics)
- swelling
- thermal buckling

### expansion waves

USE **elastic waves**

### expectancy hypothesis

GS hypotheses  
. **expectancy hypothesis**  
RT Monte Carlo method  
probability density functions  
statistical analysis  
statistical distributions

### expectation

RT contingency  
decision theory  
Fisher information  
forecasting  
reliability

### expeditions

RT exploration  
∞ missions  
space flight

### expellants

RT cough  
∞ discharge  
expulsion  
flushing

### expendable stages (spacecraft)

RT booster recovery  
booster rocket engines  
engines  
multistage rocket vehicles  
recoverable spacecraft  
reusable spacecraft  
rocket engines  
space shuttles  
stage separation

### experience

RT education  
lessons learned  
qualifications  
upgrading

### experiment design

SN (LIMITED TO DESIGN OF EXPERIMENTS--EXCLUDES PROTOTYPES)  
UF *design of experiments*  
GS **experiment design**  
. factorial design  
RT covariance  
degrees of freedom  
∞ design  
factor analysis  
laboratories  
mathematical models  
operations research  
orthogonality  
quality control  
regression analysis  
statistical analysis  
systems engineering  
Taguchi methods  
variance (statistics)

### experimental aircraft

USE **research aircraft**

### experimental boiling water reactors

UF *EBWR (reactor)*  
GS nuclear reactors  
. liquid cooled reactors  
. . water cooled reactors  
. . . boiling water reactors  
. . . . **experimental boiling water reactors**  
. nuclear research and test reactors  
. . **experimental boiling water reactors**

- . water moderated reactors
- . . **experimental boiling water reactors**

### Experimental Breeder Reactor 1

UF *EBR-1 reactor*  
GS nuclear reactors  
. breeder reactors  
. . **Experimental Breeder Reactor 1**  
. fast nuclear reactors  
. . **Experimental Breeder Reactor 1**  
. liquid cooled reactors  
. . liquid metal cooled reactors  
. . . **Experimental Breeder Reactor 1**  
. nuclear research and test reactors  
. . **Experimental Breeder Reactor 1**

### Experimental Breeder Reactor 2

UF *EBR-2 reactor*  
GS nuclear reactors  
. breeder reactors  
. . **Experimental Breeder Reactor 2**  
. fast nuclear reactors  
. . **Experimental Breeder Reactor 2**  
. liquid cooled reactors  
. . liquid metal cooled reactors  
. . . **Experimental Breeder Reactor 2**  
. nuclear research and test reactors  
. . **Experimental Breeder Reactor 2**

### experimental gas cooled reactors

UF *EGCR (reactor)*  
GS nuclear reactors  
. gas cooled reactors  
. . **experimental gas cooled reactors**  
. nuclear research and test reactors  
. . **experimental gas cooled reactors**

### experimental organic cooled reactors

UF *EOCR (reactor)*  
GS nuclear reactors  
. liquid cooled reactors  
. . organic cooled reactors  
. . . **experimental organic cooled reactors**  
. nuclear research and test reactors  
. . **experimental organic cooled reactors**  
. organic moderated reactors  
. . **experimental organic cooled reactors**

### Experimental Reflector Orbital Shot Proj

UF *EROS project*  
GS programs  
. projects  
. . **Experimental Reflector Orbital Shot Proj**

### experimental STOL transport rsch airplane

USE **Questol aircraft**

### experimentation

GS **experimentation**  
. Physics and Chemistry Experiment in Space  
RT critical experiments  
exploration  
investigation  
laboratories  
phenomenology  
spaceborne experiments

### expert systems

(added August 1990)

DEF Computer programs that manipulate symbolic information to produce the same results as human experts would. They deal with uncertain data and make decisions on that data. Input and design relies on human experts. Used for knowlege based systems.

GS information systems  
. knowledge based systems  
. . **expert systems**  
RT artificial intelligence  
belief networks

C (programming language)  
computer programming  
decision support systems  
knowledge bases (artificial intelligence)  
knowledge representation  
∞ logic  
logic programming  
natural language processing  
pilot support systems  
Prolog (programming language)  
systems health monitoring

### expiration

RT ∞ breathing  
death  
expired air  
expulsion  
mortality  
respiration

### expired air

GS gases  
. gas mixtures  
. . air  
. . . **expired air**  
mixtures  
. solutions  
. . gas mixtures  
. . . air  
. . . . **expired air**  
RT alveolar air  
exhalation  
expiration  
gas composition  
metabolic wastes  
rebreathing  
respiration

### exploding conductor circuits

USE **circuits**  
**exploding wires**

### exploding conductors

USE **exploding wires**

### exploding wires

UF *exploding conductor circuits*  
*exploding conductors*  
GS explosive devices  
. initiators (explosives)  
. . **exploding wires**  
igniters  
. initiators (explosives)  
. . **exploding wires**  
wire  
. **exploding wires**  
RT boosters (explosives)  
caps (explosives)  
conductors  
detonators  
electric wire  
plasma generators  
primers (explosives)  
radiation transport  
shock waves  
wire bridge circuits

### exploitation

RT beneficiation  
depletion  
∞ development  
exploration  
geology  
land use  
mines (excavations)  
mining  
reserves  
strip mining

### exploration

DEF The search for deposits of useful minerals or fossil fuels; prospecting, including under the oceans. It may include geologic reconnaissance, e.g., remote sensing, photogeology, geophysical and geochemical methods, and both surface and underground investigations. Used for discovering and prospecting.

UF *discovering*

prospecting  
 GS **exploration**  
 . mineral exploration  
 . natural gas exploration  
 . oil exploration  
 . space exploration  
 . . lunar exploration  
 . . Mars exploration  
 RT boreholes  
 detection  
 drilling  
 examination  
 excavation  
 expeditions  
 experimentation  
 exploitation  
 geological surveys  
 geology  
 geothermal technology  
 investigation  
 mines (excavations)  
 OSS-1 payload  
 research  
 reserves  
 sampling  
 space flight  
 surveys  
 underground acoustics

**Explorer 1 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 1 satellite**

**Explorer 2 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 2 satellite**

**Explorer 3 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 3 satellite**

**Explorer 4 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 4 satellite**

**Explorer 5 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 5 satellite**

**Explorer 6 satellite**  
 GS artificial satellites  
 . geophysical satellites  
 . . **Explorer 6 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 6 satellite**  
 RT Thor Able rocket vehicle

**Explorer 7 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 7 satellite**

**Explorer 8 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 8 satellite**

**Explorer 9 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . **Explorer 9 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 9 satellite**

RT Scout launch vehicle

**Explorer 10 satellite**  
 GS artificial satellites  
 . geophysical satellites  
 . . **Explorer 10 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 10 satellite**  
 RT Delta launch vehicle

**Explorer 11 satellite**  
 UF *Gamma Ray Astronomy Explorer*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 11 satellite**  
 RT Juno 2 launch vehicle

**Explorer 12 satellite**  
 UF *Energetic Particle Explorer A*  
*EPE-A*  
*S-3 satellite*  
 GS artificial satellites  
 . geophysical satellites  
 . . **Explorer 12 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 12 satellite**  
 RT Delta launch vehicle

**Explorer 14 satellite**  
 UF *Energetic Particle Explorer B*  
*EPE-B*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 14 satellite**  
 RT Delta launch vehicle

**Explorer 15 satellite**  
 UF *Energetic Particle Explorer C*  
*EPE-C*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 15 satellite**  
 RT Delta launch vehicle

**Explorer 16 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 16 satellite**  
 RT Scout launch vehicle

**Explorer 17 satellite**  
 UF *AE-A satellite*  
*Atmosphere Explorer A*  
*S-6 satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . **Explorer 17 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 17 satellite**  
 RT Delta launch vehicle

**Explorer 18 satellite**  
 UF *IMP-1*  
*IMP-A*  
*Interplanetary Explorer*  
*S-74 satellite*  
 GS artificial satellites  
 . lunar satellites  
 . . **Explorer 18 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 18 satellite**  
 interplanetary spacecraft  
 . **Explorer 18 satellite**  
 lunar spacecraft  
 . lunar satellites  
 . . **Explorer 18 satellite**  
 unmanned spacecraft  
 . space probes  
 . . **Explorer 18 satellite**

RT Delta launch vehicle

**Explorer 19 satellite**  
 UF *AD-A satellite*  
*Air Density Explorer A*  
 GS artificial satellites  
 . meteorological satellites  
 . . **Explorer 19 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 19 satellite**  
 RT Scout launch vehicle

**Explorer 20 satellite**  
 UF *Ionosphere Explorer A*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 20 satellite**  
 RT Scout launch vehicle

**Explorer 21 satellite**  
 UF *IMP-2*  
*IMP-B*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 21 satellite**  
 RT Delta launch vehicle

**Explorer 22 satellite**  
 UF *BE B*  
*Beacon Explorer B*  
 GS artificial satellites  
 . navigation satellites  
 . . **Explorer 22 satellite**  
 . passive satellites  
 . . Beacon satellites  
 . . . **Explorer 22 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 22 satellite**  
 expandable structures  
 . inflatable structures  
 . . inflatable spacecraft  
 . . . Beacon satellites  
 . . . **Explorer 22 satellite**  
 inflatable space structures  
 . inflatable spacecraft  
 . . Beacon satellites  
 . . . **Explorer 22 satellite**  
 space erectable structures  
 . inflatable spacecraft  
 . . Beacon satellites  
 . . . **Explorer 22 satellite**  
 RT Scout launch vehicle

**Explorer 23 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 23 satellite**  
 RT Scout launch vehicle

**Explorer 24 satellite**  
 UF *AD/I satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 24 satellite**  
 RT Scout launch vehicle

**Explorer 25 satellite**  
 UF *AD/I B*  
*Air Density/Injun Explorer B*  
*Injun Explorer*  
 GS artificial satellites  
 . Injun satellites  
 . . **Explorer 25 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 25 satellite**  
 RT Scout launch vehicle

**Explorer 26 satellite**  
 UF *Energetic Particle Explorer D*  
*EPE-D*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites



## Explorer 27 satellite

... **Explorer 26 satellite**  
 RT Delta launch vehicle

**Explorer 27 satellite**  
 UF *BE C*  
*Beacon Explorer C*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 27 satellite**  
 RT Scout launch vehicle

**Explorer 28 satellite**  
 UF *IMP-3*  
*IMP-C*  
 GS artificial satellites  
 . lunar satellites  
 . . **Explorer 28 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 28 satellite**  
 lunar spacecraft  
 . lunar satellites  
 . . **Explorer 28 satellite**  
 RT Delta launch vehicle

**Explorer 29 satellite**  
 GS artificial satellites  
 . geodetic satellites  
 . . **Explorer 29 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 29 satellite**  
 RT active satellites  
 ANNA satellites  
 celestial geodesy  
 Delta launch vehicle  
 GEOS 1 satellite  
 LARGOS satellite  
 PAGEOS satellite

**Explorer 30 satellite**  
 UF *SE-A*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 30 satellite**  
 RT Scout launch vehicle

**Explorer 31 satellite**  
 UF *DME-A satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 31 satellite**  
 RT Thor Agena launch vehicle

**Explorer 32 satellite**  
 UF *AE-B satellite*  
*Atmosphere Explorer B*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 32 satellite**  
 RT Delta launch vehicle

**Explorer 33 satellite**  
 UF *AIMP-1*  
*AIMP-D*  
*IMP-D*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 33 satellite**  
 RT Delta launch vehicle

**Explorer 34 satellite**  
 UF *IMP-4*  
*IMP-F*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 34 satellite**  
 RT Thor Agena launch vehicle

**Explorer 35 satellite**  
 UF *AIMP-2*  
*AIMP-E*  
*IMP-E*  
 GS artificial satellites

. scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 35 satellite**  
 RT Thor Agena launch vehicle

**Explorer 36 satellite**  
 GS artificial satellites  
 . geodetic satellites  
 . . **Explorer 36 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 36 satellite**  
 RT active satellites  
 ANNA satellites  
 celestial geodesy  
 GEOS 2 satellite  
 LARGOS satellite  
 PAGEOS satellite  
 Thor Agena launch vehicle

**Explorer 37 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 37 satellite**  
 RT Scout launch vehicle

**Explorer 38 satellite**  
 UF *RAE-1*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 38 satellite**  
 RT Delta launch vehicle

**Explorer 39 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 39 satellite**  
 RT Scout launch vehicle

**Explorer 40 satellite**  
 UF *Injun 5 satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 40 satellite**  
 RT Scout launch vehicle

**Explorer 41 satellite**  
 UF *IMP-5*  
*IMP-G*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 41 satellite**

*Explorer 42 satellite*  
 USE **Uhuru satellite**

**Explorer 43 satellite**  
 UF *IMP-6*  
*IMP-I*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 43 satellite**  
 RT Delta launch vehicle

**Explorer 44 satellite**  
 DEF The tenth in a series of solar radiation monitoring satellites launched from Wallops Island, VA on July 8, 1971, to measure x rays and ultraviolet radiation from the sun. It was operational until June 3, 1978. Used for Solrad 10 satellite.  
 UF *Solrad 10 satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 44 satellite**

**Explorer 45 satellite**  
 DEF One in a long series of NASA scientific satellites used to study the atmosphere, ionosphere, magnetosphere, interplanetary space, etc.  
 GS artificial satellites  
 . geophysical satellites

. . **Explorer 45 satellite**  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 45 satellite**

**Explorer 46 satellite**  
 DEF A satellite designed to study meteoroid protective ability of spacecraft launched from Wallops Island, VA on August 13, 1972. Two scientific experiments also on board were to determine the size and the velocity of meteoroids. The velocity experiment failed to work due to excessive heat. Used for Meteoroid Technology Satellite.  
 UF *Meteoroid Technology Satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 46 satellite**

**Explorer 47 satellite**  
 UF *IMP-7*  
*IMP-H*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 47 satellite**

**Explorer 48 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 48 satellite**  
 RT SAS  
 SAS-2

**Explorer 49 satellite**  
 UF *Radio Astronomy Explorer 2*  
*Radio Astronomy Explorer B*  
*RAE 1*  
*RAE 2*  
*RAE B*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 49 satellite**  
 RT Delta launch vehicle

**Explorer 50 satellite**  
 UF *IMP-8*  
*IMP-J*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 50 satellite**

**Explorer 51 satellite**  
 UF *AE-C satellite*  
*Atmosphere Explorer C*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 51 satellite**

**Explorer 52 satellite**  
 DEF The Hawkeye 1 satellite in the Explorer series. Used for Hawkeye 1 satellite.  
 UF *Hawkeye 1 satellite*  
 GS artificial satellites  
 . scientific satellites  
 . . Explorer satellites  
 . . . **Explorer 52 satellite**

**Explorer 53 satellite**  
 GS artificial satellites  
 . scientific satellites  
 . . astronomical satellites  
 . . . SAS  
 . . . . **Explorer 53 satellite**  
 . . Explorer satellites  
 . . . **Explorer 53 satellite**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . SAS  
 . . . . **Explorer 53 satellite**  
 RT SAS-3

**Explorer 54 satellite**  
 UF *AE-D satellite*

Atmosphere Explorer D  
 GS artificial satellites  
   . scientific satellites  
   . . Explorer satellites  
   . . . **Explorer 54 satellite**  
**Explorer 55 satellite**  
 UF *AE-E satellite*  
   *Atmosphere Explorer E*  
 GS artificial satellites  
   . scientific satellites  
   . . Explorer satellites  
   . . . **Explorer 55 satellite**  
 RT Delta launch vehicle  
*Explorer 71 satellite*  
 (added November 2000)  
 USE **Advanced Composition Explorer**  
*Explorer 73 satellite*  
 (added November 2000)  
 USE **Transition Region and Coronal Explorer**  
*Explorer 74 satellite*  
 (added November 2000)  
 USE **Submillimeter Wave Astronomy Satellite**  
*Explorer 77 satellite*  
 (added November 2000)  
 USE **Far UV Spectroscopic Explorer**  
*Explorer 78 satellite*  
 (added November 2000)  
 USE **IMAGE satellite**  
**Explorer satellites**  
 GS artificial satellites  
   . scientific satellites  
   . . **Explorer satellites**  
   . . . Applications Explorer Satellites  
   . . . Cosmic Background Explorer satellite  
   . . . Dual Air Density Explorer  
   . . . Dynamics Explorer satellites  
   . . . . Dynamics Explorer 1 satellite  
   . . . . Dynamics Explorer 2 satellite  
   . . . Explorer 1 satellite  
   . . . Explorer 2 satellite  
   . . . Explorer 3 satellite  
   . . . Explorer 4 satellite  
   . . . Explorer 5 satellite  
   . . . Explorer 6 satellite  
   . . . Explorer 7 satellite  
   . . . Explorer 8 satellite  
   . . . Explorer 9 satellite  
   . . . Explorer 10 satellite  
   . . . Explorer 11 satellite  
   . . . Explorer 12 satellite  
   . . . Explorer 14 satellite  
   . . . Explorer 15 satellite  
   . . . Explorer 16 satellite  
   . . . Explorer 17 satellite  
   . . . Explorer 18 satellite  
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   . . . Explorer 36 satellite  
   . . . Explorer 37 satellite  
   . . . Explorer 38 satellite  
   . . . Explorer 39 satellite  
   . . . Explorer 40 satellite  
   . . . Explorer 41 satellite  
   . . . Explorer 43 satellite  
   . . . Explorer 44 satellite

. . . Explorer 45 satellite  
 . . . Explorer 46 satellite  
 . . . Explorer 47 satellite  
 . . . Explorer 48 satellite  
 . . . Explorer 49 satellite  
 . . . Explorer 50 satellite  
 . . . Explorer 51 satellite  
 . . . Explorer 52 satellite  
 . . . Explorer 53 satellite  
 . . . Explorer 54 satellite  
 . . . Explorer 55 satellite  
 . . . Extreme Ultraviolet Explorer satellite  
 . . . Far UV Spectroscopic Explorer  
 . . . IMP  
 . . . International Magnetospheric Explorer  
 . . . International Sun Earth Explorers  
   . . . . International Sun Earth Explorer 1  
   . . . . International Sun Earth Explorer 2  
   . . . . International Sun Earth Explorer 3  
   . . . Advanced Composition Explorer  
   . . . IMAGE satellite  
   . . . Micrometeoroid Explorer satellites  
   . . . Radio Astronomy Explorer satellite  
   . . . Solar Mesosphere Explorer  
   . . . Submillimeter Wave Astronomy Satellite  
   . . . Transition Region and Coronal Explorer  
   . . . Uhuru satellite  
   . . . X Ray Timing Explorer  
 RT IUE  
 Juno 1 launch vehicle  
 Jupiter C rocket vehicle  
 meteoroid dust clouds  
 micrometeoroids  
 outer planets explorers  
 Scout project  
 Thor Delta launch vehicle  
 zodiacal dust

**explosion suppression**

DEF Any method used to confine or suppress an explosion.  
 RT fire prevention  
   foams  
   retardants

**explosions**

DEF The sudden production of large quantities of gases, usually hot, from much smaller amounts of gases, liquids, or solids.

GS **explosions**

. aerial explosions  
 . chemical explosions  
 . gas explosions  
 . . propellant explosions  
 . nuclear explosions  
 . thermonuclear explosions  
 . underground explosions  
 . underwater explosions

## RT

accidents  
 backfire  
 blast loads  
 ∞ blasts  
   bursts  
   combustion  
   detonation  
 ∞ discharge  
   explosive decompression  
   explosives  
   fires  
   flame propagation  
 ∞ flash  
   flashback  
   hazards  
   hydrocarbon combustion  
   implosions  
   reactor safety  
   Riemann waves  
   safety  
   shock waves  
   sound pressure  
   spontaneous combustion

warning systems

**explosive decompression**

GS pressure reduction  
   . **explosive decompression**  
 RT explosions  
   implosions  
   pressure recovery  
   pressurized cabins

**explosive devices**

UF *cartridge actuated devices*  
 GS **explosive devices**  
   . bombs (ordnance)  
   . initiators (explosives)  
   . boosters (explosives)  
   . caps (explosives)  
   . detonators  
   . exploding wires  
   . primers (explosives)  
   . nuclear devices  
   . shaped charges  
   . torpedoes  
 RT actuators  
   ammunition  
 ∞ charging  
 ∞ devices  
   explosives detection  
   igniters  
 ∞ propellant actuated devices  
   warheads

**explosive forming**

GS forming techniques  
   . cold working  
   . . **explosive forming**  
   metal working  
   . **explosive forming**  
 RT bulging  
   deep drawing  
   electrohydraulic forming  
   extruding  
   shaped charges

*explosive gases*

USE **flammable gases**

**explosive welding**

GS bonding  
   . **explosive welding**  
   welding  
   . pressure welding  
   . . **explosive welding**  
 RT cladding  
   metal bonding  
   metal joints  
   metal working  
   metal-metal bonding

**explosives**

GS **explosives**  
   . BSX  
   . cellulose nitrate  
   . dynamite  
   . HMX  
   . hydrazine nitroform  
   . hydrogen azides  
   . nitrasol explosives  
   . octol (explosive)  
   . pentolite  
   . RDX  
   . styphnates  
   . TATB  
   . tetryl  
   . trinitrotoluene  
 RT ammonium picrates  
   ammunition  
   azides (organic)  
   bombs (ordnance)  
   burning rate  
   case bonded propellants  
 ∞ charging  
   chemical explosions  
   chemical fuels  
   composite propellants  
   detonators  
   double base propellants  
   double base rocket propellants  
   explosions  
   fires

## explosives detection

flammable gases  
fulminates  
gun propellants  
guns (ordnance)  
hazardous materials  
nitroglycerin  
nitroguanidine  
nitromethane  
nuclear weapons  
ordnance  
PETN  
plastic propellants  
potassium perchlorates  
powder (particles)  
propellants  
pyrophoric materials  
pyrotechnics  
shaped charges  
sodium azides  
TAGN  
torpedoes  
warheads

### explosives detection

(added September 1995)

GS detection  
. chemical detection  
. . **explosives detection**  
RT airport security  
explosive devices  
ion mobility spectroscopy  
terrorism

### exponential functions

GS analysis (mathematics)  
. complex variables  
. . **exponential functions**  
. . . logarithms  
functions (mathematics)  
. transcendental functions  
. . **exponential functions**  
. . . logarithms  
RT Fourier analysis  
hyperbolic functions  
orthogonal functions  
Poisson density functions  
probability density functions  
statistical analysis  
Weibull density functions

### exponents

GS number theory  
. **exponents**  
RT arithmetic  
fractals  
logarithms

### exports

USE **international trade**

### EXPOS (Spacelab payload)

DEF X ray spectropolarimetry payload for Spacelab. Used for X Ray Spectropolarimetry Payload.

UF *X Ray Spectropolarimetry Payload*  
GS payloads  
. **EXPOS (Spacelab payload)**  
RT European Space Agency  
Spacelab

### exposure

GS **exposure**  
. weathering  
. . space weathering  
. photoperiod  
RT atmospheric effects  
bearing (direction)  
bioavailability  
cold tolerance  
dosimeters  
irradiation  
photography  
position (location)  
positioning  
radiation dosage  
time

trinitrotoluene

expressions (mathematics)

USE **formulas (mathematics)**

### expulsion

RT acceleration (physics)  
circuit protection  
disposal  
dumping  
ejection  
emptying  
excretion  
exhaust velocity  
expellants  
expiration  
fluid flow  
gravity gradient satellites  
jettisoning  
particle emission  
pressurizing  
removal  
unloading

### expulsion bladders

GS diaphragms (mechanics)  
. **expulsion bladders**  
RT bellows  
ejection  
emptying  
expandable structures  
fuel tank pressurization  
fuel tanks  
pressurizing  
propellant storage  
propellant tanks  
storage tanks

extars

USE **x ray stars**

extended duration space flight

USE **long duration space flight**

### extensions

GS **extensions**  
. prolongation  
RT accessories  
adapters  
contracts  
decontamination  
expansion  
filling  
fittings  
insurance (contracts)  
revisions  
supplements

### extensometers

DEF Devices for determining the elongation of a specimen as it is strained. Used for dilatometers.

UF *dilatometers*  
GS measuring instruments  
. **extensometers**  
RT deformeters  
dilatometry  
elastometers  
mechanical measurement  
strain gages  
stress measurement  
tensometers  
thermal expansion  
transducers

### external combustion engines

GS engines  
. **external combustion engines**  
. . Stirling engines  
RT automobile engines  
boilers  
gas turbine engines  
internal combustion engines  
piston engines

### external store separation

UF *store release*  
RT nacelles  
pods (external stores)  
protuberances

∞ separation  
∞ storage  
wing tanks  
wing-fuselage stores

### external stores

GS **external stores**  
. pods (external stores)  
RT nacelles  
protuberances  
∞ storage  
wing tanks  
wing-fuselage stores

### external surface currents

GS electric current  
. **external surface currents**  
RT ∞ currents  
electric fields  
electromagnetic fields  
electromagnetic missiles  
electromagnetic pulses  
levitation melting  
photoelectric emission  
spacecraft charging  
∞ surfaces  
system generated electromagnetic pulses

### external tanks

UF *Shuttle Superlightweight Tank*  
*SLWT (propellant tank)*  
GS tanks (containers)  
. **external tanks**  
RT fuel tanks  
nacelles  
propellant tanks  
Space Shuttle Ascent Stage  
storage tanks  
wing tanks

### externally blown flaps

UF *blown flaps*  
*EBF*  
GS airfoils  
. flaps (control surfaces)  
. . **externally blown flaps**  
. . . upper surface blown flaps  
control surfaces  
. flaps (control surfaces)  
. . **externally blown flaps**  
. . . upper surface blown flaps  
RT blowing  
jet flaps  
lift  
lift devices  
powered lift aircraft  
short takeoff aircraft  
spanwise blowing  
wing flaps  
wing nacelle configurations

### extinction

GS **extinction**  
. interstellar extinction  
RT Cenozoic Era  
Cretaceous-Tertiary boundary  
evolution (development)  
extinguishing  
fading  
fluorescence  
laser induced fluorescence  
Nemesis (star)

extinguishers

USE **fire extinguishers**

### extinguishing

UF *flame quenching*  
GS **extinguishing**  
. flameout  
RT burnout  
combustion  
extinction  
occultation  
∞ quenching  
quenching (cooling)

### extraction

GS **extraction**

- . geothermal energy extraction
- . ion extraction
- . solvent extraction
- RT beds (process engineering)
- beneficiation
- centrifuges
- centrifuging
- columns (process engineering)
- concentrating
- dialysis
- diffusion
- dissolving
- elution
- filtration
- furnaces
- hydrolysis
- leaching
- material absorption
- materials recovery
- melting
- osmosis
- percolation
- recycling
- refining
- removal
- ∞ separation
- solvents
- sorption
- washers (cleaners)
- extragalactic light*
- USE **extraterrestrial radiation**
- extragalactic media*
- USE **intergalactic media**
- extragalactic radio sources**
- GS celestial bodies
  - . radio sources (astronomy)
  - . . **extragalactic radio sources**
  - . . . radio galaxies
  - . . . radio jets (astronomy)
- RT BL Lacertae objects
- blazars
- extraterrestrial radiation
- extraterrestrial radio waves
- quasars
- radiation sources
- radio astronomy
- radio emission
- ∞ sources
- extrapolation**
- RT finite difference theory
- forecasting
- interpolation
- periodic variations
- quality control
- statistical analysis
- ∞ tests
- time series analysis
- trends
- extrasensory perception**
- UF *parapsychology*
- GS perception
  - . sensory perception
  - . . **extrasensory perception**
- extrasolar planet detection*  
(added January 2003)
- USE **planet detection**
- extrasolar planets**
- UF *exoplanets*
- exosolar planets*
- GS celestial bodies
  - . planets
  - . . **extrasolar planets**
- RT gas giant planets
- hypothetical planets
- Kepler mission
- planet detection
- planetary systems
- extraterrestrial communication**
- GS telecommunication
  - . space communication
  - . . **extraterrestrial communication**
- RT information dissemination
- interplanetary communication
- radio telemetry
- extraterrestrial environments**
- GS environments
  - . **extraterrestrial environments**
  - . . cislunar space
  - . . deep space
  - . . . interplanetary space
  - . . . interstellar space
  - . . Earth orbital environments
  - . . lunar environment
  - . . . lunar atmosphere
  - . . planetary environments
  - . . . Mars environment
  - . . . . Mars atmosphere
  - . . . planetary atmospheres
  - . . . . helium hydrogen atmospheres
  - . . . . Jupiter atmosphere
  - . . . . Mars atmosphere
  - . . . . Mercury atmosphere
  - . . . . Neptune atmosphere
  - . . . . planetary ionospheres
  - . . . . Pluto atmosphere
  - . . . . Saturn atmosphere
  - . . . . Uranus atmosphere
  - . . . . Venus atmosphere
  - . . . . Venus clouds
  - . . . planetary magnetospheres
  - . . . . planetary magnetotails
  - . . satellite atmospheres
  - . . . lunar atmosphere
  - . . Titan atmosphere
  - . . stellar atmospheres
  - . . chromosphere
  - . . . solar atmosphere
  - . . . . solar transition region
- RT aerospace environments
- high gravity environments
- long duration space flight
- Mars bases
- Mercury surface
- space exploration
- space weathering
- spacecraft environments
- Venus surface
- extraterrestrial intelligence**
- DEF Intelligent life existing elsewhere than on Earth.
- GS intelligence
  - . **extraterrestrial intelligence**
- RT interstellar communication
- interstellar travel
- Project SETI
- space communication
- unidentified flying objects
- extraterrestrial life**
- DEF Life forms evolved and existing outside the terrestrial biosphere.
- GS life sciences
  - . **extraterrestrial life**
- RT aerospace environments
- biofilms
- biomarkers
- biosatellites
- exobiology
- extraterrestrial water
- life detectors
- panspermia
- Phoenix Mars Lander
- planetary protection
- extraterrestrial matter**
- GS **extraterrestrial matter**
  - . cosmic gases
  - . . interplanetary gas
  - . . interstellar gas
  - . cosmic plasma
  - . interstellar matter
  - . . cosmic dust
  - . . . interplanetary dust
  - . . . . meteoroid dust clouds
  - . . . . . zodiacal dust
  - . . dark matter
  - . . interstellar gas
- RT cosmochemistry
- degenerate matter
- matter (physics)
- negative matter
- Venus fly trap rocket vehicle
- extraterrestrial oceans**  
(added June 2001)
- SN (EXCLUDES MAGMA OCEANS)
- DEF Extensive bodies of water on planets and moons.
- UF *planetary oceans*
- satellite oceans*
- GS oceans
  - . **extraterrestrial oceans**
- RT Callisto
- Europa
- extraterrestrial water
- planetary surfaces
- satellite surfaces
- extraterrestrial radiation**
- DEF Electromagnetic or particle radiation emitted from a source beyond the Earth atmosphere. Used for extragalactic light and space radiation.
- UF *extragalactic light*
- space radiation*
- GS **extraterrestrial radiation**
  - . extraterrestrial radio waves
  - . . galactic radio waves
  - . . . North Polar Spur (astronomy)
  - . . radio bursts
  - . . . solar radio bursts
  - . . . . type 2 bursts
  - . . . . type 3 bursts
  - . . . . type 4 bursts
  - . . . . type 5 bursts
  - . . solar radio emission
  - . . . solar radio bursts
  - . . . . type 2 bursts
  - . . . . type 3 bursts
  - . . . . type 4 bursts
  - . . . . type 5 bursts
  - . . cosmic microwave background radiation
  - . . galactic radiation
  - . . galactic cosmic rays
  - . . galactic radio waves
  - . . . North Polar Spur (astronomy)
  - . . galactic winds
  - . gamma ray bursts
  - . gegenschein
  - . interstellar radiation
  - . lunar radiation
  - . planetary radiation
  - . primary cosmic rays
  - . . solar cosmic rays
  - . solar radiation
  - . . circumsolar radiation
  - . . solar corpuscular radiation
  - . . . solar electrons
  - . . . solar neutrinos
  - . . . solar neutrons
  - . . . solar protons
  - . . solar cosmic rays
  - . . solar radio emission
  - . . . solar radio bursts
  - . . . . type 2 bursts
  - . . . . type 3 bursts
  - . . . . type 4 bursts
  - . . . . type 5 bursts
  - . . solar wind
  - . . solar x-rays
  - . . sunlight
  - . stellar radiation
  - . . stellar winds
  - . zodiacal light
- RT aerospace environments
- ∞ aerospace sciences
- atmospheric radiation
- background radiation
- corpuscular radiation
- cosmic rays
- cosmic x rays
- CRRES (satellite)
- Earth orbital environments
- electromagnetic noise
- electromagnetic radiation
- electron acceleration
- extragalactic radio sources
- light (visible radiation)
- Lyman alpha radiation

## extraterrestrial radio waves

Lyman beta radiation  
microwave emission  
polarized electromagnetic radiation  
polarized radiation  
∞ radiation  
radiation belts  
radiative transfer  
radio jets (astronomy)  
radio waves  
∞ rays  
relic radiation  
synchrotron radiation  
system generated electromagnetic pulses  
terrestrial radiation  
x rays

### extraterrestrial radio waves

UF *cosmic radio waves*  
GS electromagnetic radiation  
. radio waves  
. . . **extraterrestrial radio waves**  
. . . . galactic radio waves  
. . . . . North Polar Spur (astronomy)  
. . . . . radio bursts  
. . . . . solar radio bursts  
. . . . . type 2 bursts  
. . . . . type 3 bursts  
. . . . . type 4 bursts  
. . . . . type 5 bursts  
. . . . solar radio emission  
. . . . . solar radio bursts  
. . . . . type 2 bursts  
. . . . . type 3 bursts  
. . . . . type 4 bursts  
. . . . . type 5 bursts  
. . . . cosmic microwave background radiation  
extraterrestrial radiation  
. **extraterrestrial radio waves**  
. . galactic radio waves  
. . . North Polar Spur (astronomy)  
. . radio bursts  
. . . solar radio bursts  
. . . . type 2 bursts  
. . . . type 3 bursts  
. . . . type 4 bursts  
. . . . type 5 bursts  
. . . solar radio emission  
. . . solar radio bursts  
. . . . type 2 bursts  
. . . . type 3 bursts  
. . . . type 4 bursts  
. . . . type 5 bursts  
. . cosmic microwave background radiation  
RT centimeter waves  
extragalactic radio sources  
microwave emission  
microwaves  
millimeter waves  
radio astronomy  
radio emission  
radio frequency interference  
radio jets (astronomy)  
radio sources (astronomy)

### extraterrestrial resources

GS resources  
. **extraterrestrial resources**  
. . lunar resources  
RT in situ resource utilization  
lunar exploration  
planetary bases  
space exploration  
space logistics

### extraterrestrial roving vehicles

USE **roving vehicles**

### extraterrestrial water

(added May 2005)

DEF Water beyond the surface, lithosphere, hydrosphere, and atmosphere of the Earth; includes the water content of interstellar matter, comets, planets, and satellites.

GS water  
. **extraterrestrial water**  
RT Europa  
exobiology

extraterrestrial life  
extraterrestrial oceans  
icy satellites  
Mars (planet)  
Mars Reconnaissance Orbiter  
Phoenix Mars Lander  
planetary composition

### extravehicular activity

SN (ACTIVITY OUTSIDE THE SPACECRAFT)  
DEF Activities by crew members conducted outside the spacecraft pressure hull or within the cargo bay when the cargo bay doors are open.  
UF *EVA*  
*spacewalks*  
RT ∞ activity  
AEPS  
aerospace environments  
Apollo extension system  
astronaut locomotion  
astronaut maneuvering equipment  
Crew Equipment Translation Aid (ISS)  
extravehicular mobility units  
IMLSS  
intravehicular activity  
man operated propulsion systems  
manned maneuvering units  
manned space flight  
orbital workers  
self maneuvering units  
space flight  
space maintenance  
Space Shuttle payloads  
umbilical connectors  
weightlessness

### extravehicular mobility units

SN (LIMITED TO SPACE SUIT UNITS OF THAT NAME DESIGNED FOR THE SPACE TRANSPORTATION SYSTEM)  
DEF Independent anthropometric space suit systems that provide crew members with environmental protection, life support, mobility, communications, and visibility while performing various extravehicular activities.  
GS clothing  
. protective clothing  
. . pressure suits  
. . . space suits  
. . . . **extravehicular mobility units**  
. . . suits  
. . . pressure suits  
. . . space suits  
. . . . **extravehicular mobility units**  
RT astronaut locomotion  
astronaut maneuvering equipment  
Crew Equipment Translation Aid (ISS)  
extravehicular activity  
IMLSS  
life support systems  
self maneuvering units  
space transportation system

### extrema

USE **range (extremes)**

### Extreme Ultraviolet Explorer satellite

DEF An Explorer satellite carrying scientific instruments for scanning the sky in the 100-900 Angstrom region of the spectrum to study the very hot celestial bodies (white dwarfs, for example). Used for EUVE.

UF *EUVE*  
GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . **Extreme Ultraviolet Explorer satellite**

RT IUE  
ultraviolet astronomy

### extreme ultraviolet radiation

DEF Ultraviolet emission in the 100-1000 Angstrom range.  
GS electromagnetic radiation  
. ultraviolet radiation  
. . **extreme ultraviolet radiation**  
RT beams (radiation)  
ionizing radiation  
Magellan ultraviolet astronomy  
satellite

∞ radiation  
solar radiation

### extremely high frequencies

SN (30 TO 300 GHZ)  
UF *K band*  
*KA band*  
*V band*  
GS frequencies  
. radio frequencies  
. . microwave frequencies  
. . . **extremely high frequencies**  
RT ACTS  
millimeter waves

### extremely low frequencies

SN (BELOW 300 HZ)  
UF *ultralow frequencies*  
GS frequencies  
. radio frequencies  
. . **extremely low frequencies**  
RT audio frequencies  
low frequencies  
Seafarer project

### extremum values

DEF In statistics, the upper or lower bound of the random variable which is not expected to be exceeded by a specified percentage of the population within a given confidence interval.  
GS analysis (mathematics)  
. real variables  
. . **extremum values**  
. . . limits (mathematics)  
. . . maxima  
. . . minima  
. . . . Cramer-Rao bounds  
RT Euler-Lagrange equation  
functions (mathematics)  
optimization  
∞ peaks  
probability theory

### extroversion

RT behavior  
human behavior  
psychology

### extruding

UF *hot extruding*  
GS forming techniques  
. **extruding**  
. . pultrusion  
RT casting  
cladding  
cold working  
dies  
∞ drawing  
explosive forming  
injection molding  
intrusion  
metal spinning  
metal working  
piercing  
pressing (forming)  
squeeze casting  
wet spinning

### eye (anatomy)

GS anatomy  
. sense organs  
. . **eye (anatomy)**  
. . . choroid membranes  
. . . conjunctiva  
. . . cornea  
. . . oculomotor nerves  
. . . pupils  
. . . retina  
. . . . fovea  
RT accommodation  
color vision  
face (anatomy)  
head (anatomy)  
lenses  
miosis  
nystagmus  
ophthalmodynamometry  
ophthalmology  
optometry  
photoreceptors

vestibular nystagmus  
vision

**eye diseases**

GS diseases  
 . **eye diseases**  
 . . asthenopia  
 . . astigmatism  
 . . cataracts  
 . . conjunctivitis  
 . . glaucoma  
 . . keratitis  
 . . phoria  
 RT blindness  
 hyperopia  
 ophthalmology

**eye dominance**

GS dominance  
 . **eye dominance**  
 RT vision

**eye examinations**

GS examination

**. eye examinations**

RT electronystagmography  
 haploscopes  
 ophthalmology

**eye movements**

GS **eye movements**  
 . nystagmus  
 . . vestibular nystagmus  
 . Saccadic eye movements  
 RT blinking  
 electronystagmography  
 head movement  
 oculometers  
 rapid eye movement state  
 visual tasks

**eye protection**

GS protection  
 . **eye protection**  
 RT flash blindness  
 goggles  
 sunglasses

visors

**eyepieces**

GS optical equipment  
 . **eyepieces**  
 RT binoculars  
 contact lenses  
 lenses  
 microscopes  
 periscopes  
 reticles  
 sunglasses  
 telescopes

**Eyring theory**

GS kinetic theory  
 . transport theory  
 . . **Eyring theory**  
 RT equilibrium flow  
 fluid dynamics  
 ∞ theories

# F

## F 1 region

- GS Earth atmosphere
  - . upper atmosphere
  - .. Earth ionosphere
  - ... upper ionosphere
  - .... F region
  - ..... **F 1 region**
- regions
- . F region
- .. **F 1 region**

## F 2 region

- GS Earth atmosphere
    - . upper atmosphere
    - .. Earth ionosphere
    - ... upper ionosphere
    - .... F region
    - ..... **F 2 region**
  - regions
  - . F region
  - .. **F 2 region**
- RT spread F  
transequatorial propagation

## F centers

- USE **color centers**

## F displays

- USE **F region**

## F layer

- USE **F region**

## F region

SN (ALTITUDES ABOVE APPROXIMATELY 160 KM)  
 DEF A portion of the ionosphere extending from about 150 to 1000 km. The F region is subdivided into the F1 (150 to 250 km) and the F2 (250 to 1000 km) regions. The F2 region generally has the largest electron density and it persists throughout the night. The F region is the one most commonly used for long range high frequency propagation.

- UF *F displays*  
*F layer*  
*night F layer*
  - GS Earth atmosphere
    - . upper atmosphere
    - .. Earth ionosphere
    - ... upper ionosphere
    - .... **F region**
    - ..... F 1 region
    - ..... F 2 region
  - regions
  - . **F region**
  - .. F 1 region
  - .. F 2 region
- RT plasma bubbles  
radio transmission

## F stars

- GS celestial bodies
  - . stars
  - .. **F stars**
- RT blue stars  
dwarf stars  
G stars  
giant stars  
main sequence stars  
stellar spectra

## F-1 rocket engine

- GS engines
  - . rocket engines
  - .. liquid propellant rocket engines
  - ... **F-1 rocket engine**
- RT booster rocket engines  
Nova launch vehicles  
Saturn launch vehicles

## F-2 aircraft

- UF *Hawker Hunter aircraft*  
*Hunter F-2 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-2 aircraft**
- Hawker Siddeley aircraft
- . **F-2 aircraft**

- jet aircraft
- . **F-2 aircraft**
- monoplanes
- . **F-2 aircraft**
- RT  $\infty$  aircraft

## F-4 aircraft

- UF *F-110 aircraft*  
*F4H aircraft*  
*Phantom aircraft*  
*RF-4 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-4 aircraft**
- jet aircraft
- . **F-4 aircraft**
- McDonnell Douglas aircraft
- . McDonnell aircraft
- .. **F-4 aircraft**
- monoplanes
- . **F-4 aircraft**
- supersonic aircraft
- . **F-4 aircraft**
- RT  $\infty$  aircraft
- J-79 engine

## F4H aircraft

- USE **F-4 aircraft**

## F-5 aircraft

- UF *Freedom Fighter aircraft*  
*N-156 aircraft*
- GS attack aircraft
  - . COIN aircraft
  - .. **F-5 aircraft**
- . fighter aircraft
- .. **F-5 aircraft**
- jet aircraft
- . turbofan aircraft
- .. **F-5 aircraft**
- monoplanes
- . **F-5 aircraft**
- Northrop aircraft
- . **F-5 aircraft**
- supersonic aircraft
- . **F-5 aircraft**
- RT  $\infty$  aircraft

## F-8 aircraft

- UF *Crusader aircraft*  
*F8U aircraft*  
*RF-8 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-8 aircraft**
- jet aircraft
- . **F-8 aircraft**
- Ling-Temco-Vought aircraft
- . **F-8 aircraft**
- monoplanes
- . **F-8 aircraft**
- single engine aircraft
- . **F-8 aircraft**
- supersonic aircraft
- . **F-8 aircraft**
- RT  $\infty$  aircraft

## F8U aircraft

- USE **F-8 aircraft**

## F-9 aircraft

- UF *Cougar aircraft*  
*F9F aircraft*  
*Panther aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-9 aircraft**
- Grumman aircraft
- . **F-9 aircraft**
- jet aircraft
- . **F-9 aircraft**
- monoplanes
- . **F-9 aircraft**
- single engine aircraft
- . **F-9 aircraft**

- RT  $\infty$  aircraft

## F9F aircraft

- USE **F-9 aircraft**

## F-14 aircraft

- GS attack aircraft
  - . fighter aircraft
  - .. **F-14 aircraft**
- Grumman aircraft
- . **F-14 aircraft**
- jet aircraft
- . **F-14 aircraft**
- supersonic aircraft
- . **F-14 aircraft**
- RT  $\infty$  aircraft

## F-15 aircraft

- GS attack aircraft
  - . fighter aircraft
  - .. **F-15 aircraft**
- jet aircraft
- . **F-15 aircraft**
- supersonic aircraft
- . **F-15 aircraft**
- RT  $\infty$  aircraft

## F-16 aircraft

- UF *YF-16 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-16 aircraft**
- jet aircraft
- . **F-16 aircraft**
- single engine aircraft
- . **F-16 aircraft**
- supersonic aircraft
- . **F-16 aircraft**
- RT  $\infty$  aircraft

## F-17 aircraft

- UF *YF-17 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-17 aircraft**
- jet aircraft
- . **F-17 aircraft**
- monoplanes
- . **F-17 aircraft**
- supersonic aircraft
- . **F-17 aircraft**
- RT  $\infty$  aircraft
- F-18 aircraft

## F-18 aircraft

- GS attack aircraft
  - . fighter aircraft
  - .. **F-18 aircraft**
- jet aircraft
- . **F-18 aircraft**
- McDonnell Douglas aircraft
- . **F-18 aircraft**
- Northrop aircraft
- . **F-18 aircraft**
- RT  $\infty$  aircraft
- F-17 aircraft

## F-20 aircraft

- GS attack aircraft
  - . fighter aircraft
  - .. **F-20 aircraft**
- jet aircraft
- . **F-20 aircraft**
- Northrop aircraft
- . **F-20 aircraft**

## F-22 aircraft

- (added August 1993)
- UF *advanced tactical fighter*  
*ATF*  
*YF-22 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - .. **F-22 aircraft**
- jet aircraft
- . **F-22 aircraft**
- supersonic aircraft
- . **F-22 aircraft**

- RT ∞ aircraft
- F-27 aircraft**  
 UF *Fokker F 27 aircraft*  
*Fokker Friendship aircraft*  
 GS Fokker aircraft  
 . **F-27 aircraft**  
 jet aircraft  
 . turboprop aircraft  
 . . **F-27 aircraft**  
 monoplanes  
 . **F-27 aircraft**  
 passenger aircraft  
 . **F-27 aircraft**  
 transport aircraft  
 . **F-27 aircraft**  
 RT ∞ aircraft
- F-28 helicopter**  
 GS light aircraft  
 . **F-28 helicopter**  
 passenger aircraft  
 . **F-28 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . rigid rotor helicopters  
 . . . . **F-28 helicopter**
- F-28 transport aircraft**  
 UF *Fellowship aircraft*  
*Fokker F 28 aircraft*  
 GS commercial aircraft  
 . **F-28 transport aircraft**  
 Fokker aircraft  
 . **F-28 transport aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **F-28 transport aircraft**  
 monoplanes  
 . **F-28 transport aircraft**  
 passenger aircraft  
 . **F-28 transport aircraft**  
 transport aircraft  
 . **F-28 transport aircraft**  
 RT ∞ aircraft
- F-80 aircraft*  
 USE **T-33 aircraft**
- F-84 aircraft**  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-84 aircraft**  
 jet aircraft  
 . **F-84 aircraft**  
 monoplanes  
 . **F-84 aircraft**  
 Republic aircraft  
 . **F-84 aircraft**  
 single engine aircraft  
 . **F-84 aircraft**  
 RT ∞ aircraft
- F-86 aircraft**  
 UF *Sabre aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-86 aircraft**  
 jet aircraft  
 . **F-86 aircraft**  
 monoplanes  
 . **F-86 aircraft**  
 North American aircraft  
 . **F-86 aircraft**  
 single engine aircraft  
 . **F-86 aircraft**  
 RT ∞ aircraft
- F-89 aircraft**  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-89 aircraft**  
 jet aircraft  
 . **F-89 aircraft**  
 monoplanes  
 . **F-89 aircraft**  
 Northrop aircraft  
 . **F-89 aircraft**
- RT ∞ aircraft
- F-94 aircraft**  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-94 aircraft**  
 jet aircraft  
 . **F-94 aircraft**  
 Lockheed aircraft  
 . **F-94 aircraft**  
 monoplanes  
 . **F-94 aircraft**  
 single engine aircraft  
 . **F-94 aircraft**  
 RT ∞ aircraft
- F-100 aircraft**  
 UF *Super Sabre aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-100 aircraft**  
 jet aircraft  
 . **F-100 aircraft**  
 monoplanes  
 . **F-100 aircraft**  
 North American aircraft  
 . **F-100 aircraft**  
 single engine aircraft  
 . **F-100 aircraft**  
 supersonic aircraft  
 . **F-100 aircraft**  
 RT ∞ aircraft
- F-101 aircraft**  
 UF *JF 101 aircraft*  
*Voodoo aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-101 aircraft**  
 jet aircraft  
 . **F-101 aircraft**  
 McDonnell Douglas aircraft  
 . McDonnell aircraft  
 . . **F-101 aircraft**  
 single engine aircraft  
 . **F-101 aircraft**  
 supersonic aircraft  
 . **F-101 aircraft**  
 RT ∞ aircraft
- F-102 aircraft**  
 UF *Delta Dagger aircraft*  
*YF-102 aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-102 aircraft**  
 General Dynamics aircraft  
 . **F-102 aircraft**  
 jet aircraft  
 . **F-102 aircraft**  
 monoplanes  
 . **F-102 aircraft**  
 single engine aircraft  
 . **F-102 aircraft**  
 supersonic aircraft  
 . **F-102 aircraft**  
 tailless aircraft  
 . **F-102 aircraft**  
 RT ∞ aircraft
- F-104 aircraft**  
 UF *Canadair CF-104 aircraft*  
*CF-104 aircraft*  
*Starfighter aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-104 aircraft**  
 jet aircraft  
 . **F-104 aircraft**  
 Lockheed aircraft  
 . **F-104 aircraft**  
 monoplanes  
 . **F-104 aircraft**  
 single engine aircraft  
 . **F-104 aircraft**  
 supersonic aircraft  
 . **F-104 aircraft**
- RT ∞ aircraft
- RT ∞ aircraft
- F-105 aircraft**  
 UF *Thunderchief aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-105 aircraft**  
 jet aircraft  
 . **F-105 aircraft**  
 monoplanes  
 . **F-105 aircraft**  
 Republic aircraft  
 . **F-105 aircraft**  
 single engine aircraft  
 . **F-105 aircraft**  
 RT ∞ aircraft
- F-106 aircraft**  
 UF *Delta Dart aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-106 aircraft**  
 General Dynamics aircraft  
 . **F-106 aircraft**  
 jet aircraft  
 . **F-106 aircraft**  
 monoplanes  
 . **F-106 aircraft**  
 single engine aircraft  
 . **F-106 aircraft**  
 supersonic aircraft  
 . **F-106 aircraft**  
 tailless aircraft  
 . **F-106 aircraft**  
 RT ∞ aircraft
- F-110 aircraft*  
 USE **F-4 aircraft**
- F-111 aircraft**  
 UF *LASV*  
*TFX aircraft*  
 GS attack aircraft  
 . bomber aircraft  
 . . **F-111 aircraft**  
 General Dynamics aircraft  
 . **F-111 aircraft**  
 Grumman aircraft  
 . **F-111 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **F-111 aircraft**  
 supersonic aircraft  
 . **F-111 aircraft**  
 RT ∞ aircraft  
 mission adaptive wings  
 variable sweep wings
- F-117A aircraft**  
*(added April 1991)*  
 GS attack aircraft  
 . fighter aircraft  
 . . **F-117A aircraft**  
 jet aircraft  
 . **F-117A aircraft**  
 RT ∞ aircraft  
 aircraft detection  
 bomber aircraft
- FAB (programming language)*  
 USE **FORTRAN**
- fabrication**  
 GS **fabrication**  
 . nanofabrication  
 . space manufacturing  
 RT assembling  
 assembling  
 construction  
 low gravity manufacturing  
 manufacturing  
 production management  
 rapid prototyping  
 resin film infusion  
 resin transfer molding  
 self assembly



**fabrics**

squeeze casting

**fabrics**

- UF *cloth*
- GS **fabrics**
  - . crepe
  - . Dacron (trademark)
  - . felts
  - . Fortisan (trademark)
  - . gauze
  - . linen
  - . parachute fabrics
  - . silk
  - . wool
- RT clothing
  - coatings
  - cotton
  - fibers
- ∞ films
  - flame retardants
  - geotechnical fabrics
  - gores
  - interlayers
  - laminates
  - mesh
  - micarta
  - multilayer insulation
  - reinforcing materials
  - ribbons
- ∞ sheets
  - socks
  - textiles
  - weaving
  - webbing
  - webs (sheets)
  - wire cloth
  - woven composites

**Fabry-Perot interferometers**

- GS measuring instruments
  - . interferometers
  - . . **Fabry-Perot interferometers**
- RT etalons
  - microwave interferometers
  - plasma diagnostics

*Fabry-Perot lasers*

USE **lasers**

**Fabry-Perot spectrometers**

- GS measuring instruments
  - . radiation measuring instruments
  - . . **Fabry-Perot spectrometers**
  - . spectrometers
  - . . **Fabry-Perot spectrometers**
- RT actinometers
  - airglow
  - auroral spectroscopy
  - optical equipment
  - optical measuring instruments

**face (anatomy)**

- GS anatomy
  - . **face (anatomy)**
  - . . chin
  - . . forehead
  - . . mouth
  - . . . lips (anatomy)
  - . . nose (anatomy)
- RT eye (anatomy)
  - head (anatomy)

**face centered cubic lattices**

- UF *FCC lattices*
- GS crystal lattices
  - . cubic lattices
  - . . **face centered cubic lattices**
- RT body centered cubic lattices
  - close packed lattices
  - cluster variation method
  - crystals

*facets*

USE **flat surfaces**

∞ **facilities**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT airports
  - electric power plants

- ground handling
- industrial areas
- industrial plants
- land use
- launching bases
- logistics
- logistics management
- military air facilities
- mobile quarantine facility
- research facilities
- roads
- site selection
- sites
- Solar Cell Calibration Facility
- stations
- terminal facilities
- test facilities
- X Ray Astrophysics Facility

**facsimile communication**

(added September 1992)

- UF *facsimile transmission*
- fax*
- GS telecommunication
  - . communication
  - . . **facsimile communication**
  - . . . automatic picture transmission
- RT interplanetary communication
  - Iridium network
  - lunar communication
  - satellite communication
  - spacecraft communication
  - teletypewriter systems
  - television systems
  - transoceanic communication
  - wireless communication

*facsimile transmission*

USE **facsimile communication**

**factor analysis**

- GS statistical analysis
  - . **factor analysis**
- RT autoregressive processes
  - correlation
  - covariance
  - degrees of freedom
  - experiment design
  - factorization
  - matrices (mathematics)
  - orthogonality
  - regression analysis
  - statistical tests
  - variability
  - variance (statistics)

**factorial design**

- GS experiment design
  - . **factorial design**
- RT ∞ design
  - mathematical models
  - sensitivity analysis
  - statistical analysis

**factorials**

- GS analysis (mathematics)
  - . combinatorial analysis
  - . . **factorials**
- RT binomial coefficients
  - gamma function

*factories*

USE **industrial plants**

**factorization**

- DEF Process or instance of factoring.
- GS **factorization**
  - . Cholesky factorization
- RT algorithms
  - factor analysis
  - finite element method
  - real variables

*factors*

USE **variable**

**faculae**

DEF Large patches of bright material forming a veined network in the vicinity of sunspots. They appear to be more permanent than sun-

spots and are probably due to elevated clouds of luminous gas. Used for plages (faculae) and solar faculae.

- UF *plages (faculae)*
- solar faculae*
- GS stellar activity
  - . solar activity
  - . . **faculae**

- RT ∞ activity
  - chromosphere
  - photosphere
  - starspots
  - sunspots

**Faddeev equations**

- RT ∞ equations
  - particle collisions
  - scattering amplitude
  - wave scattering

**fading**

- GS **fading**
  - . signal fading
  - . . Rayleigh fading
  - . . selective fading
- RT attenuation
  - bleaching
  - color
  - discoloration
  - electromagnetic absorption
  - extinction
  - reception diversity
  - signal fading rate
  - wave dispersion

*fahrenheit temperature scale*

USE **temperature scales**

**fail-safe systems**

- DEF Systems used to minimize risk in case of malfunction.
- RT ∞ automation
  - emergencies
  - fault tolerance
  - safety devices
  - safety management
  - self tests
- ∞ systems

**failure**

- GS **failure**
  - . burnthrough (failure)
  - . engine failure
  - . structural failure
  - . system failures
- RT aborted missions
- ∞ breakdown
  - buckling
  - burn-in
  - collapse
  - corrosion
  - cracking (fracturing)
  - cumulative damage
  - deformation
  - destruction
  - deterioration
  - distortion
  - downtime
  - electrical faults
  - failure analysis
  - fatigue (materials)
  - flashover
  - fractures (materials)
  - malfunctions
  - Mills ratio
  - rupturing
  - shearing
  - short circuits
  - structural strain
  - temperature inversions
  - wear

**failure analysis**

- DEF Subsequent to failure, the logical, systematic examination of an item, its construction, application, and documentation to identify the failure mode and determine the failure mechanism and its basic cause.
- RT acoustic emission
- ∞ analyzing

burn-in  
burst tests  
failure  
fatigue life  
fault detection  
fault tolerance  
fiber pullout  
lessons learned  
life (durability)  
Mills ratio  
MTBF  
preventive maintenance  
probability density functions  
reliability  
risk assessment  
statistical analysis  
trend analysis

**failure modes**

GS modes  
  . **failure modes**  
RT buckling  
  cracks  
  elastic buckling  
  fault detection  
  fiber pushout  
  kink bands  
  kinking  
∞ mode  
  mode (statistics)  
  MTBF  
  shearing

**faint object camera**

DEF One of the five components of the first scientific payload of the Hubble Space Telescope. The faint object camera will be used to observe extremely faint astronomical objects with wavelengths between 120 and 700 nm.

GS optical equipment  
  cameras  
  . . **faint object camera**  
  photographic equipment  
  cameras  
  . . **faint object camera**  
RT astronomical photography  
  Hubble Space Telescope  
  infrared photography  
  optical measuring instruments  
  spaceborne astronomy  
  spaceborne telescopes  
  ultraviolet photography

**faint objects**

GS celestial bodies  
  . **faint objects**  
RT galaxies  
  stars

*fainting*

USE **syncope**

*Fairchild military aircraft*

USE **Fairchild-Hiller aircraft**

**Fairchild-Hiller aircraft**

UF *Fairchild military aircraft*  
GS **Fairchild-Hiller aircraft**  
  C-119 aircraft  
  C-123 aircraft  
  OH-5 helicopter  
  OH-23 helicopter  
  XC-142 aircraft  
RT ∞ aircraft

**Fairey aircraft**

GS **Fairey aircraft**  
  FD 2 aircraft  
RT ∞ aircraft

*Fairey Delta 2 aircraft*

USE **FD 2 aircraft**

**fairings**

GS symmetrical bodies  
  streamlined bodies  
  . . **fairings**  
RT aerodynamic configurations  
  aircraft structures  
  canopies

cowlings  
fillets  
housings  
landing gear  
nacelles  
ogives  
perforated shells  
protectors  
protuberances  
sheaths  
shells (structural forms)  
∞ spinners  
streamlining  
wing roots

**Faith 7**

GS manned spacecraft  
  Mercury spacecraft  
  . . **Faith 7**  
  reentry vehicles  
  recoverable spacecraft  
  . . Mercury spacecraft  
  . . . **Faith 7**  
  soft landing spacecraft  
  Mercury spacecraft  
  . . **Faith 7**  
  space capsules  
  Mercury spacecraft  
  . . **Faith 7**  
RT Mercury MA-2 flight  
  Mercury MA-9 flight

**Falcon missile**

GS missiles  
  air to air missiles  
  . . **Falcon missile**  
  antiaircraft missiles  
  . . **Falcon missile**  
RT M-46 engine  
  solid propellant rocket engines

**Falkner-Skan equation**

GS analysis (mathematics)  
  real variables  
  . . differential equations  
  . . . **Falkner-Skan equation**  
RT Blasius equation  
  boundary layer separation  
∞ equations  
  laminar flow  
  Prandtl-Meyer expansion  
  wedge flow

**falling**

RT atmospheric entry  
  descent trajectories  
  particle motion  
∞ precipitation  
  sinking  
  vertical motion

**falling spheres**

GS symmetrical bodies  
  bodies of revolution  
  . . spheres  
  . . . **falling spheres**  
RT balls  
  drop towers  
  free fall  
  globules  
  raindrops  
  spheroids

**fallout**

UF *washout (radioactivity)*  
RT air pollution  
  fission products  
  fission weapons  
  nuclear explosion effect  
  nuclear explosions  
  nuclear meteorology  
  post-blast nuclear radiation  
∞ radiation  
  radiation effects  
  radiation hazards  
  radioactive contaminants  
∞ radioactive debris

radioactivity

**false alarms**

DEF In general, the unwanted detection of input noise. In radar, an indication of a detected target even though one does not exist, due to noise or interference levels exceeding the set threshold of detection.

RT error signals  
  signal to noise ratios  
  warning systems

**fan blades**

DEF One or more revolving vanes attached to a rotary hub and operated by a motor.

RT compressor blades  
  ducted fans  
∞ fans  
  propeller blades  
  rotary wings  
  turbine blades  
  turbomachine blades  
  ventilation fans

**fan in wing aircraft**

GS **fan in wing aircraft**  
  XV-5 aircraft  
RT ∞ aircraft  
  lift fans  
  research aircraft  
  short takeoff aircraft  
  tilt wing aircraft  
  V/STOL aircraft  
  vertical takeoff aircraft

*fanlift devices*

USE **lift fans**

## ∞ fans

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT actuator disks  
  air conditioning equipment  
  air ducts  
  antenna radiation patterns  
  blowers  
  compressor rotors  
  compressors  
  ducted fans  
  fan blades  
  propeller fans  
  turbofans  
  ventilation fans  
  wind tunnel drives

**fans (landforms)**

DEF Gently sloping, fan-shaped masses of detritus forming sections of very low shaped cones commonly at places where there is a notable decrease in gradient; specifically, alluvial fans. Also fan-shaped masses of congealed lava that formed on steep slopes by the continual changing direction of flow. Used for bajadas.

UF *bajadas*  
GS landforms

. . **fans (landforms)**

RT alluvium  
  canyons  
  clays  
  deltas  
  gravels  
  mud  
  sands  
  sediments

**far fields**

DEF (1- antennas) Those regions of the field of an antenna where the angular field distribution is essentially independent of the distance from a specified point in the antenna region. (2-fiber optics) The regions, far from source, where the diffraction pattern is substantially the same as that at infinity. (mobile communication) The regions of the field of an antenna where the angular field distance is essentially independent of the distance from the antenna. Used for Fraunhofer region.

UF *Fraunhofer region*  
GS electromagnetic fields

## far infrared radiation

- . **far fields**
  - RT antenna radiation patterns
  - electromagnetic radiation
  - field theory (physics)
  - Fresnel region
  - laser arrays
  - near fields
  - noise propagation
  - radiant flux density
- far infrared radiation**
- SN (30 MICRONS TO ABOUT 1000 MICRONS)
  - GS electromagnetic radiation
  - . infrared radiation
  - . . **far infrared radiation**
  - RT long wave radiation
  - near infrared radiation
  - ∞ radiation
  - radio waves
  - short wave radiation
  - submillimeter waves
  - terrestrial radiation
- far ultraviolet radiation**
- SN (200 TO 2000 ANGSTROMS)
  - UF *vacuum ultraviolet radiation*
  - GS electromagnetic radiation
  - . ultraviolet radiation
  - . . **far ultraviolet radiation**
  - . . . Lyman alpha radiation
  - . . . Lyman beta radiation
  - RT bremsstrahlung
  - Magellan ultraviolet astronomy satellite
  - near ultraviolet radiation
  - ∞ radiation
  - ultraviolet telescopes
  - x rays

### Far UV Spectroscopic Explorer

DEF High-orbit, ultraviolet space observatory covering the wavelength range of 90. 5-119. 5 nm. The primary objective of FUSE is to use high-resolution spectroscopy at far ultraviolet wavelengths to study the origin and evolution of the lightest elements (hydrogen and deuterium) created shortly after the Big Bang, and the forces and processes involved in the evolution of galaxies, stars, and planetary systems.

UF *Explorer 77 satellite*  
*FUSE (satellite)*

- GS artificial satellites
- . scientific satellites
- . . Explorer satellites
- . . . **Far UV Spectroscopic Explorer**

### Faraday dark space

- RT gas discharge tubes
- glow discharges

### Faraday effect

- UF *Faraday rotation*
- GS electromagnetic properties
- . **Faraday effect**
- RT circulators (phase shift circuits)
- ∞ effects
- Hall generators
- Kerr magneto-optical effect
- magneto-optics
- optical measurement
- optical properties
- polarization (waves)
- polarized electromagnetic radiation
- rotation

### Faraday rotation

USE **Faraday effect**

### farm crops

- GS **farm crops**
- . alfalfa
- . coffee
- . cotton
- . fruits
- . grains (food)
- . . barley
- . . corn
- . . millet
- . . oats
- . . rice

- . . sorghum
- . . wheat
- . hay
- . leguminous plants
- . . soybeans
- . potatoes
- . spinach
- . sugar beets
- . sugar cane
- . sunflowers
- . tomatoes
- RT agriculture
- AgRISTARS project
- botany
- crop calendars
- crop dusting
- crop growth
- crop inventories
- crop vigor
- ∞ crops
- curing
- Earth resources
- farmlands
- frost damage
- grasses
- grasslands
- irrigation
- Large Area Crop Inventory Experiment
- locusts
- orchards
- planting
- plants (botany)
- plowing
- seeds
- vineyards

### farmlands

- UF *croplands*  
*plowed fields*
- GS land
- RT **farmlands**
- agriculture
- agrophysical units
- crop growth
- crop identification
- crop inventories
- crop vigor
- ∞ crops
- Earth resources
- farm crops
- grasses
- grasslands
- hay
- irrigation
- land use
- plains
- planting
- plowing
- regional planning
- rural areas
- rural land use
- sod
- sugar beets
- sugar cane

### fast Fourier transformations

- UF *FFT*
- GS analysis (mathematics)
- . functional analysis
- . . integral transformations
- . . . Fourier transformation
- . . . . **fast Fourier transformations**
- functions (mathematics)
- . Fourier transformation
- . . **fast Fourier transformations**
- transformations (mathematics)
- . integral transformations
- . . Fourier transformation
- . . . **fast Fourier transformations**
- RT vortex in cell technique
- Walsh function

### fast neutrons

DEF Neutrons of energy exceeding some threshold that must be specified (typically 0. 1 or MeV); often associated with those neutrons predominately responsible for displacement damage of materials in neutron radiation fields.

- GS nuclear radiation

- . **fast neutrons**
- particles
- . elementary particles
- . . fermions
- . . . neutrons
- . . . . **fast neutrons**
- . neutral particles
- . . neutrons
- . . . **fast neutrons**
- RT baryons
- nucleons
- thermal neutrons

### fast nuclear reactors

- GS nuclear reactors
- . **fast nuclear reactors**
- . . Experimental Breeder Reactor 1
- . . Experimental Breeder Reactor 2
- . . fast oxide reactors
- . . fast test reactors
- . . gas cooled fast reactors
- . . liquid metal fast breeder reactors
- RT Enrico Fermi atomic power plant
- nuclear power reactors

### fast oxide reactors

- GS nuclear reactors
- . fast nuclear reactors
- . . **fast oxide reactors**
- RT nuclear power reactors

### fast test reactors

- GS nuclear reactors
- . fast nuclear reactors
- . . **fast test reactors**
- RT ∞ reactors

### fasteners

- GS **fasteners**
- . anchors (fasteners)
- . bolts
- . . rock bolts
- . . tiebolts
- . . locks (fasteners)
- . . nuts (fasteners)
- . . pins
- . . rivets
- . . screws
- . . washers (spacers)
- . . zippers
- RT adhesives
- ∞ bands
- ∞ belts
- brackets
- cables (ropes)
- chains
- clamps
- clips
- closures
- connectors
- couplings
- fittings
- holders
- hooks
- inserts
- interference fit
- joints (junctions)
- latches
- linkages
- locking
- lugs
- mooring
- ribbons
- sleeves
- spacers
- ∞ spikes
- splicing
- splines
- straps
- structural members
- studs (structural members)
- ∞ tapes
- unions (connectors)
- wire

### fasting

- RT aerospace medicine
- diets
- food intake

hypoxia

**fat embolisms**

- GS diseases
  - . fat embolisms embolisms
  - . fat embolisms
- RT aeroembolism
  - blood vessels
  - cardiovascular system
  - heart diseases

**fatigue (biology)**

DEF State of the human organism after exposure to any time of physical or psychological stress (e.g., pilot fatigue).

- GS **fatigue (biology)**
  - . auditory fatigue
  - . flight fatigue
  - . muscular fatigue
- RT asthenopia
- ∞ biology
  - damage
  - effort
  - ∞ endurance
    - exhaustion
    - human factors engineering
    - hyperkinesia
    - massaging
  - ∞ performance
    - physical exercise
    - sleep deprivation
    - stress (biology)
    - stress (physiology)
    - stress (psychology)
    - workloads (psychophysiology)
    - work-rest cycle

**fatigue (materials)**

DEF A weakening or deterioration of metal or other material occurring under load, especially under repeated cyclic, or continued loading. Used for strain fatigue and structural fatigue.

- UF *strain fatigue*
- UF *structural fatigue*
- GS **fatigue (materials)**
  - . acoustic fatigue
  - . bending fatigue
  - . metal fatigue
  - . thermal fatigue
  - . volumetric strain
- RT Bauschinger effect
  - crack closure
  - crack geometry
  - crack propagation
  - cracking (fracturing)
  - cracks
  - creep properties
  - crystal dislocations
  - cycles
  - damage
  - destruction
  - ductility
  - ∞ endurance
    - failure
    - fractography
    - fretting
    - fretting corrosion
    - hardness
  - ∞ materials
    - mechanical properties
    - notch sensitivity
    - plastic properties
    - residual strength
    - shear properties
    - shot peening
    - S-N diagrams
    - stress concentration
    - stress cycles
    - stress ratio
    - stress relaxation
    - stress relieving
    - stresses
    - structural failure
    - surface defects
    - system failures
    - temperature inversions
    - thermal stresses

vibration

**fatigue diagrams**USE **S-N diagrams****fatigue life**

DEF The number of cycles of stress or strain of a specified character that a given specimen sustains before failure of a specified nature occurs.

- GS life (durability)
  - . **fatigue life**
  - mechanical properties
  - . **fatigue life**
- RT accelerated life tests
  - blowouts
  - Coffin-Manson law
  - combined stress
  - failure analysis
  - interference fit
  - Palmgren-Miner rule
  - retirement for cause
  - service life
  - short cracks
  - S-N diagrams
  - stress cycles

**fatigue testing machines**

- RT acoustic emission
- ∞ machinery
- ∞ test equipment

**fatigue tests**

- RT bending
  - Coffin-Manson law
  - creep tests
  - destructive tests
  - ferrography
  - impact testing machines
  - impact tests
  - load tests
  - ∞ materials tests
    - notch strength
    - notch tests
    - resonance testing
    - S-N diagrams
    - specimen geometry
    - static tests
    - stress concentration
    - stress cycles
    - stress ratio
    - tensile tests
    - testing time
  - ∞ tests
    - thermal cycling tests
    - Weibull density functions
    - weld tests

**fats**

- GS organic compounds
  - . lipids
  - . . **fats**
- RT adipose tissues
  - ∞ food
    - greases
    - myelin
  - ∞ nutrients
    - oils
    - palmitic acid
    - synthetic food

**fatty acids**

- GS acids
  - . carboxylic acids
  - . . **fatty acids**
  - . . . acetic acid
  - . . . . ethylenediaminetetraacetic acids
  - . . . . iodoacetic acid
  - . . . . acetylsalicylic acid
  - . . . benzoic acid
  - . . . lipoic acid
  - . . . oleic acid
  - . . . palmitic acid
  - . . . propionic acid
  - . . . sebacic acid
  - . . . valeric acid
  - organic compounds
  - . carboxylic acids
  - . . **fatty acids**

- . . . acetic acid
- . . . . ethylenediaminetetraacetic acids
- . . . . iodoacetic acid
- . . . . acetylsalicylic acid
- . . . benzoic acid
- . . . benzoic acid
- . . . lipoic acid
- . . . oleic acid
- . . . palmitic acid
- . . . propionic acid
- . . . sebacic acid
- . . . valeric acid

- RT ∞ aliphatic compounds
  - castor oil
  - ∞ nutrients

**fault detection**

(added September 1993)

- GS detection
  - . **fault detection**
- RT electronic equipment tests
  - engine monitoring instruments
  - error detection codes
  - failure analysis
  - failure modes
  - fault tolerance
  - maintenance
  - reliability engineering
  - structural health monitoring
  - system failures
  - systems health monitoring

**fault mechanics**USE **fracture mechanics****fault tolerance**

DEF The capability of systems to function despite one or more critical failures, by use of redundant circuits or functions and/or reconfigurable elements.

- RT error analysis
  - error detection codes
  - fail-safe systems
  - failure analysis
  - fault detection
  - reliability engineering

**fault trees**

DEF Acyclic directed graphs used in the analysis or prediction of faults and defects.

- GS trees (mathematics)
  - . **fault trees**
- RT graphs (charts)
  - topology

∞ **faults**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT electrical faults
  - geological faults
  - landforms
  - massifs
  - seamounts
  - test pattern generators

**fauna**USE **animals****fax**USE **facsimile communication****fayalite**

- GS iron compounds
  - . **fayalite**
  - minerals
  - . **fayalite**
  - silicon compounds
  - . silicates
  - . . **fayalite**

**FBFM (modulation)**USE **feedback frequency modulation****FBL control**USE **fly by light control****FBM (missiles)**USE **fleet ballistic missiles****FCC lattices**USE **face centered cubic lattices****FD 2 aircraft**UF *Fairey Delta 2 aircraft*

## FDL-5 reentry vehicle

GS Fairey aircraft  
. **FD 2 aircraft**  
jet aircraft  
. **FD 2 aircraft**  
monoplanes  
. **FD 2 aircraft**  
research vehicles  
. research aircraft  
. . **FD 2 aircraft**  
tailless aircraft  
. **FD 2 aircraft**

RT ∞ aircraft  
delta wings

**FDL-5 reentry vehicle**

GS lifting bodies  
. lifting reentry vehicles  
. . **FDL-5 reentry vehicle**  
reentry vehicles  
. maneuverable reentry bodies  
. . lifting reentry vehicles  
. . . **FDL-5 reentry vehicle**

**FDMA**

USE **frequency division multiple access**

**FDTD (mathematics)**  
(added April 1999)

USE **finite difference time domain method**

**fear**

GS phobias  
. **fear**  
. . fear of flying

RT anxiety  
emotions  
neuroses  
panic  
psychoses

**fear of flying**

GS phobias  
. fear  
. . **fear of flying**

RT anxiety  
emotions  
neuroses

**feasibility**

RT cost analysis  
costs  
efficiency  
estimating  
evaluation

**feasibility analysis**

RT cost analysis  
economic factors  
management planning  
research management  
systems analysis  
technology assessment

**Feather River Basin (CA)**

GS landforms  
. structural basins  
. . river basins  
. . . **Feather River Basin (CA)**

RT California  
rivers

**feathering**

RT propeller blades  
propellers

**feature extraction**

USE **pattern recognition**

**Feature Identification and Location Exper**

SN (FEATURE IDENTIFICATION AND LOCATION EXPERIMENT)

RT Earth observations (from space)  
image processing  
pattern recognition  
remote sensing  
remote sensors  
scene analysis

Space Shuttle payloads

**feces**

GS wastes  
. metabolic wastes  
. . human wastes  
. . . **feces**

RT excretion  
perspiration  
urine

**federal budgets**

RT allocations  
appropriations

∞ budgets  
contracts  
cost estimates  
financial management  
government procurement  
procurement management

*Federal Republic of Germany*

USE **West Germany**

**federations**

GS organizations  
. **federations**  
. . bureaus (organizations)

RT European Union  
institutions  
international cooperation  
nations  
teams  
unionization  
United Nations

**feed systems**

RT cold flow tests  
feeding (supplying)  
fuel tanks  
intake systems  
pumps

∞ systems

**feedback**

DEF The return of a portion of the output of a device to the input; positive feedback adds to the input, negative feedback subtracts from the input. Information such as progress or results, returned to an originating source. In aeronautics, the transmittal of forces initiated by aerodynamic action on control surfaces or rotor blades to the cockpit controls; the forces so transmitted.

GS **feedback**  
. biofeedback  
. . sensory feedback  
. negative feedback  
. nonlinear feedback  
. positive feedback

RT compensators  
complexity  
control theory  
cybernetics  
electromagnetic interference  
emotional factors  
oscillations  
oscillators  
screech tones

∞ systems  
transfer functions

**feedback amplifiers**

GS amplifiers  
. **feedback amplifiers**

RT distributed feedback lasers  
nonlinear feedback  
operational amplifiers  
oscillators  
phantastrons  
positive feedback  
power amplifiers  
self oscillation  
servoamplifiers  
transistor amplifiers  
voltage amplifiers

**feedback circuits**

GS circuits  
. **feedback circuits**

RT feedforward control

transfer functions

**feedback control**

DEF A control system in which the controlled quantity is measured and compared with a standard representing the desired performance. Any deviation from the standard is fed back into the control system in such a sense that it will reduce the deviation of the controlled quantity from the standard.

UF *closed loop systems*

GS automatic control  
. **feedback control**  
. . cascade control

RT adaptive control  
adaptive optics  
automatic frequency control  
automatic gain control

∞ automation  
biofeedback

∞ control  
control equipment  
control systems design  
control theory  
distributed feedback lasers  
dynamic control  
electronic control  
H-2 control  
H-infinity control  
inverse kinematics  
Kalman-Schmidt filtering  
linear parameter-varying control  
linear quadratic Gaussian control  
linear quadratic regulator  
loop transfer functions  
loop transfer recovery  
machine learning  
MIMO (control systems)  
model reference adaptive control  
multivariable control  
negative feedback  
nonlinear feedback  
observability (systems)  
optical control  
optimal control  
proportional control  
robot control  
robustness (mathematics)  
sampled data systems  
servocontrol  
servomechanisms  
SISO (control systems)  
stability augmentation  
Terminal Configured Vehicle Program  
tracking problem

**feedback frequency modulation**

UF *FBFM (modulation)*

GS coding  
. signal encoding  
. . frequency modulation  
. . . **feedback frequency modulation**  
modulation  
. frequency modulation  
. . **feedback frequency modulation**

RT phase locked systems

**feeders**

SN (FOR FLUID AND PARTICULATE MATERIALS)

RT conveyors  
dispensers  
distributors  
feeding (supplying)  
fuel systems  
injectors  
intake systems  
loading operations  
materials handling  
mixers

**feedforward control**

GS automatic control  
. **feedforward control**

RT adaptive control

∞ automation

∞ control  
control theory  
feedback circuits  
model reference adaptive control

- optimal control
- feeding (supplying)**  
 RT feed systems  
 feeders  
 injection  
 input  
 ∞ loading  
 materials handling
- feelings*  
 USE **sensory feedback**
- feet (anatomy)**  
 DEF The lower, pedal extremities of the legs.  
 GS anatomy  
 . limbs (anatomy)  
 . leg (anatomy)  
 . . . **feet (anatomy)**  
 appendages  
 . leg (anatomy)  
 . . . **feet (anatomy)**
- feldspars**  
 DEF A group of abundant rock-forming minerals of the family of anhydrous silicates.  
 GS aluminum compounds  
 . aluminum silicates  
 . . . **feldspars**  
 . . . plagioclase  
 minerals  
 . **feldspars**  
 . . plagioclase  
 silicon compounds  
 . silicates  
 . . aluminum silicates  
 . . . **feldspars**  
 . . . . plagioclase  
 RT andesite  
 anorthosite  
 felsite  
 igneous rocks
- Fellowship aircraft*  
 USE **F-28 transport aircraft**
- felsite**  
 DEF A light colored, fine grained igneous rock composed chiefly of quartz or feldspar.  
 GS rocks  
 . igneous rocks  
 . . **felsite**  
 RT feldspars  
 minerals  
 quartz
- felts**  
 GS fabrics  
 . **felts**  
 RT wool
- females**  
 UF *women*  
 RT adults  
 children  
 gynecology  
 human beings  
 males  
 menstruation  
 sex  
 sex factor  
 zygotes
- femur**  
 GS anatomy  
 . musculoskeletal system  
 . . bones  
 . . . **femur**  
 RT knee (anatomy)  
 leg (anatomy)
- ∞ **fences**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT airfoil fences  
 fences (barriers)
- tracking stations
- fences (barriers)**  
 RT ∞ barriers  
 boundaries  
 ∞ fences  
 gates (openings)
- Fermat principle**  
 DEF The principle which states that the path along which electromagnetic radiation travels between any two points will be that path for which the elapsed time for the travel is a minimum.  
 RT electromagnetic wave transmission  
 light transmission  
 multipath transmission  
 optical thickness  
 velocity
- fermentation**  
 GS chemical reactions  
 . **fermentation**  
 metabolism  
 . enzyme activity  
 . . **fermentation**  
 RT bioconversion  
 butyric acid
- Fermi Gamma-ray Space Telescope**  
*(added August 2008)*  
 DEF Gamma-ray astronomy observatory in low-Earth orbit, comprised of the Large Area Telescope and the GLAST Burst Monitor, used to explore the extreme Universe, dark matter composition, black hole material acceleration, and the high-energy behavior of gamma-ray bursts. The observatory will also be used to investigate solar flares, pulsars, and cosmic ray origins.  
 UF *Gamma-ray Large Area Space Telescope*  
*GLAST*  
 GS artificial satellites  
 . scientific satellites  
 . . astronomical satellites  
 . . . **Fermi Gamma-ray Space Telescope**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . **Fermi Gamma-ray Space Telescope**  
 telescopes  
 . gamma ray telescopes  
 . . **Fermi Gamma-ray Space Telescope**  
 . . spaceborne telescopes  
 . . **Fermi Gamma-ray Space Telescope**  
 RT cosmic rays  
 gamma ray astronomy  
 spaceborne astronomy
- Fermi liquids**  
 GS liquids  
 . cryogenic fluids  
 . . **Fermi liquids**  
 RT cryogenics  
 electronic structure
- Fermi surfaces**  
 RT Brillouin zones  
 cyclotron resonance  
 energy levels  
 magnetoresistivity  
 ∞ surfaces  
 transition probabilities
- Fermi-Dirac statistics**  
 DEF The statistics of an assembly of identical half-integer spin particles; such particles have wave functions antisymmetrical with respect to particle interchange and satisfy the Pauli exclusion principle.  
 RT bosons  
 degenerate matter  
 fermions  
 quantum mechanics  
 quantum statistics
- ∞ statistics
- fermions**  
 GS particles  
 . elementary particles  
 . . **fermions**  
 . . . baryons  
 . . . hyperons  
 . . . . xi hyperons  
 . . . . omega-mesons  
 . . . . rho-mesons  
 . . . . sigma-mesons  
 . . . . eta-mesons  
 . . . leptons  
 . . . . antineutrinos  
 . . . . electrons  
 . . . . . conduction electrons  
 . . . . . free electrons  
 . . . . . high energy electrons  
 . . . . . relativistic electron beams  
 . . . . . hot electrons  
 . . . . . N electrons  
 . . . . . negatrons  
 . . . . . photoelectrons  
 . . . . . pi-electrons  
 . . . . . polarons  
 . . . . . solar electrons  
 . . . . muons  
 . . . . neutrinos  
 . . . . . solar neutrinos  
 . . . . positrons  
 . . . meson resonance  
 . . . . X mesons  
 . . . neutrons  
 . . . cold neutrons  
 . . . fast neutrons  
 . . . photoneutrons  
 . . . solar neutrons  
 . . . thermal neutrons  
 . . . protons  
 . . . recoil protons  
 . . . solar protons  
 RT Fermi-Dirac statistics  
 heavy fermion systems  
 particle decay  
 Pauli exclusion principle  
 quantum statistics  
 supersymmetry
- fermium**  
 GS chemical elements  
 . actinide series  
 . . transuranium elements  
 . . . **fermium**  
 . . . nuclides  
 . . . isotopes  
 . . . radioactive isotopes  
 . . . . transuranium elements  
 . . . . . **fermium**  
 metals  
 . actinide series  
 . . transuranium elements  
 . . . **fermium**
- Ferranti Mercury computer**  
 GS data processing equipment  
 . computers  
 . . digital computers  
 . . . **Ferranti Mercury computer**
- ferrates**  
 GS iron compounds  
 . **ferrates**  
 . . barium ferrates
- ferric ions**  
 GS ions  
 . metal ions  
 . . **ferric ions**  
 RT iron
- ferrimagnetic materials**  
 GS magnetic materials  
 . **ferrimagnetic materials**  
 RT ferromagnetic materials  
 ∞ materials
- ferrimagnetism**  
 GS magnetic properties  
 . **ferrimagnetism**

## ferrimagnets

RT ferrimagnets  
magnons

**ferrimagnets**

GS magnets  
. **ferrimagnets**

RT ferrimagnetism  
permanent magnets

## ferrites

DEF Solid solutions of carbon in alpha-iron.  
GS iron compounds  
. **ferrites**

RT austenite  
ferritic stainless steels  
gadolinium-gallium garnet  
gyrators  
iron alloys  
magnetic cores  
microstructure  
pearlite  
spinel  
steels  
yttrium-aluminum garnet  
yttrium-iron garnet

## ferritic stainless steels

GS alloys  
. iron alloys  
. . . steels  
. . . stainless steels  
. . . . **ferritic stainless steels**

RT chromium steels  
ferrites  
heat treatment  
magnetic properties  
mechanical properties

## ferroalloys

USE **iron alloys**

## ferrocenes

GS iron compounds  
. **ferrocenes**  
. . . alkylferrocene  
organometallic compounds  
. **ferrocenes**  
. . . alkylferrocene

## ferroelastic materials

(added June 1998)

GS **ferroelastic materials**  
. shape memory alloys  
. . . nitinol alloys

RT ceramics  
ferroelasticity  
ferroelectric materials  
∞ materials  
smart materials

## ferroelasticity

(added June 1998)

GS mechanical properties  
. elastic properties  
. . . **ferroelasticity**

RT crystal structure  
domain wall  
ferroelastic materials  
ferroelectricity  
phase transformations  
shape memory alloys  
smart materials

## ferroelectric materials

(added March 1997)

RT barium titanates  
ceramics  
ferroelastic materials  
ferroelectricity  
ferromagnetic materials  
lead zirconate titanates  
liquid crystals  
∞ materials  
∞ polymers  
smart materials  
thin films

## ferroelectricity

GS electrical properties  
. **ferroelectricity**

RT antiferroelectricity  
Curie temperature  
dielectric properties  
ferroelasticity  
ferroelectric materials  
microwave switching

## ferrofluids

GS liquids  
. **ferrofluids**  
magnetic materials  
. ferromagnetic materials  
. . . **ferrofluids**

RT dispersions  
∞ fluids  
magnetorheological fluids  
microparticles  
suspending (mixing)  
∞ suspensions  
working fluids

## ferrography

DEF A technique for the isolation and analysis of wear particles in a lubricant.

RT fatigue tests  
metallography  
wear tests

## ferromagnetic films

GS magnetic materials  
. ferromagnetic materials  
. . **ferromagnetic films**  
thin films  
. **ferromagnetic films**

## ferromagnetic materials

GS magnetic materials  
. **ferromagnetic materials**  
. . ferrofluids  
. . ferromagnetic films  
. . magnetite  
. . Permalloys (trademark)

RT ferrimagnetic materials  
ferroelectric materials  
magnetorheological fluids  
magnets  
∞ materials  
permanent magnets  
smart materials  
yokes

## ferromagnetic resonance

GS resonance  
. magnetic resonance  
. . **ferromagnetic resonance**

RT magnetic fields  
paramagnetic resonance

## ferromagnetism

GS magnetic properties  
. **ferromagnetism**

RT antiferromagnetism  
Curie temperature  
Curie-Weiss law  
diamagnetism  
Ising model  
Langevin formula  
magnetic cores  
magnetic dispersion  
magnets  
magnons

## ferrous metals

GS metals  
. **ferrous metals**

RT alloys  
chemical elements  
iron  
iron isotopes  
∞ metallurgy

## ferry spacecraft

UF *space buses*

GS maneuverable spacecraft  
. **ferry spacecraft**  
manned spacecraft  
. **ferry spacecraft**

RT Astro vehicle  
cargo spacecraft  
Columbus space station

MARS (Manned Reusable  
Spacecraft)  
reentry vehicles  
rendezvous spacecraft  
reusable spacecraft  
soft landing spacecraft  
space stations

## fertility

RT breeding (reproduction)  
fertilization  
reproduction (biology)  
reproductive systems  
zygotes

## fertilization

RT birth  
fertility  
in vitro methods and tests  
recombination reactions  
∞ reproduction  
spermatozoa  
zygotes

## fertilizers

RT ammonia  
ammonium nitrates  
ashes  
cultivation  
planting  
ureas  
vegetation growth

## FET (transistors)

USE **field effect transistors**

## fetuses

UF *foetuses*

RT birth  
eggs  
embryology  
embryos  
reproduction (biology)  
reproductive systems

## fever

RT body temperature  
hyperthermia  
skin temperature (biology)

## Feynman diagrams

GS diagrams  
. **Feynman diagrams**

RT electromagnetic interactions  
Minkowski space  
particle interactions  
quantum electrodynamics

## FFAR rocket vehicle

USE **Folding Fin aircraft rocket vehicle**

## Ffowcs Williams-Hawkings equation

(added December 2006)

DEF A governing equation of noise generation by sources on, and the fluid motion in the vicinity of a moving surface based on the acoustic analogy. It is an inhomogeneous linear wave equation. The inhomogeneous terms of this equation are known as thickness, loading, and quadrupole (nonlinear) source terms.

UF *FW-H equation*

GS algebra  
. linear equations  
. . **Ffowcs Williams-Hawkings equation**  
analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **Ffowcs Williams-Hawkings equation**  
. linear equations  
. . . **Ffowcs Williams-Hawkings equation**  
wave equations  
. **Ffowcs Williams-Hawkings equation**

RT aeroacoustics  
aerodynamic noise  
aircraft noise

- blade slap noise
  - computational aeroacoustics
  - flow noise
  - noise prediction
  - noise prediction (aircraft)
  - propeller noise
  - rotor aerodynamics
  - surface noise interactions
  - wave propagation
- FFT**  
USE **fast Fourier transformations**
- FGM (materials)**  
USE **functionally gradient materials**
- FH-1100 helicopter**  
USE **OH-5 helicopter**
- Fiat aircraft**  
GS **Fiat aircraft**  
. G-91 aircraft  
. G-95/4 aircraft  
. G-222 aircraft  
RT ∞ aircraft
- Fiat G-91 aircraft**  
USE **G-91 aircraft**
- Fiat G-95/4 aircraft**  
USE **G-95/4 aircraft**
- Fiat G-222 aircraft**  
USE **G-222 aircraft**
- fiber bridging**  
USE **crack bridging**
- fiber composites**  
DEF Structural materials consisting of combinations of metals or alloys or plastics reinforced with one or more types of fibers.  
GS composite materials  
. **fiber composites**  
. . . aramid fiber composites  
. . . braided composites  
. . . carbon fiber reinforced plastics  
. . . carbon-phenolic composites  
. . . glass fiber reinforced plastics  
. . . woven composites  
RT aluminum boron composites  
aluminum graphite composites  
aramid fibers  
boron fibers  
boron reinforced materials  
boron-epoxy composites  
Borsic (tradename)  
carbon fibers  
carbon-carbon composites  
carbon-silicon carbide composites  
ceramic fibers  
chemical vapor infiltration  
composite wrapping  
crack bridging  
debonding (materials)  
fiber pullout  
fiber pushout  
fiber volume fraction  
fiber-matrix interfaces  
filament winding  
functionally gradient materials  
graphite  
graphite-epoxy composites  
hybrid composites  
kink bands  
kinking  
laminates  
matrix materials  
metal fibers  
metal matrix composites  
micarta  
polymer matrix composites  
pultrusion  
reinforced plastics  
reinforcing fibers  
reinforcing materials  
resin transfer molding  
sheet molding compounds  
stacking sequence (composite materials)
- superhybrid materials
- three dimensional composites

**fiber lasers**  
(added October 1997)  
GS electronic equipment  
. solid state devices  
. . solid state lasers  
. . . **fiber lasers**  
stimulated emission devices  
. lasers  
. . solid state lasers  
. . . **fiber lasers**  
. . waveguide lasers  
. . . **fiber lasers**

RT fiber optics  
laser materials  
laser pumping  
light amplifiers  
optical fibers  
optical pumping  
semiconductor lasers

**fiber optics**  
DEF The technique of transmitting light through long thin, flexible fibers of glass, plastic, or other transparent materials.  
RT Cassegrain optics  
crystal optics  
electron tubes  
evanescent waves  
fiber lasers  
fly by light control  
geometrical optics  
gradient index optics  
light emitting diodes  
light transmission  
numerical aperture  
optical fibers  
∞ optics  
optoelectronic devices  
photonics  
physical optics  
plastic fibers  
Sagnac effect  
scintillating fibers  
smart structures  
vidicons

**fiber orientation**  
RT aramid fibers  
boron fibers  
ceramic fibers  
composite materials  
dynamic response  
epoxy matrix composites  
fiber volume fraction  
glass fiber reinforced plastics  
impact loads  
lay-up  
mechanical properties  
∞ orientation  
reinforcing fibers  
stacking sequence (composite materials)

**fiber pullout**  
UF **fiber release**  
GS releasing  
. **fiber pullout**  
RT adhesive bonding  
carbon fibers  
ceramic matrix composites  
composite materials  
failure analysis  
fiber composites  
fiber pushout  
fibers  
interfacial energy  
∞ materials tests  
metal matrix composites  
reinforcing fibers

**fiber pushout**  
(added September 1999)  
GS releasing  
. **fiber pushout**  
RT ceramic matrix composites  
composite materials  
debonding (materials)

  - destructive tests
  - failure modes
  - fiber composites
  - fiber pullout
  - fiber-matrix interfaces
  - fibers
  - interfacial energy
  - ∞ materials tests
  - metal matrix composites
  - reinforcing fibers

**fiber release**  
USE **fiber pullout**

**fiber strength**  
GS mechanical properties  
. **fiber strength**  
RT aramid fibers  
bending  
boron fibers  
ceramic fibers  
compressive strength  
fiber volume fraction  
Hookes law  
Poisson ratio  
shear strength  
∞ strength  
tensile strength

**fiber volume fraction**  
(added April 1992)  
GS composition (property)  
. concentration (composition)  
. . **fiber volume fraction**  
ratios  
. **fiber volume fraction**  
RT composite materials  
fiber composites  
fiber orientation  
fiber strength  
reinforcing fibers

**fiberboard**  
USE **boards (paper)**

**fiberglass**  
USE **glass fibers**

**fiber-matrix interfaces**  
(added July 1994)  
GS interfaces  
. **fiber-matrix interfaces**  
RT composite materials  
fiber composites  
fiber pushout  
interfacial energy  
matrix materials  
reinforcing fibers

**fibers**  
UF **fibrous materials**  
*Refrasil (trademark)*  
GS **fibers**  
. cotton fibers  
. hair  
. linen  
. metal fibers  
. microfibers  
. optical fibers  
. . scintillating fibers  
. plastic fibers  
. reinforcing fibers  
. . aramid fibers  
. . . Kevlar (trademark)  
. . boron fibers  
. . carbon fibers  
. silk  
. synthetic fibers  
. . aramid fibers  
. . . Kevlar (trademark)  
. . ceramic fibers  
. . Dacron (trademark)  
. . Fortisan (trademark)  
. . glass fibers  
. . Nylon (trademark)  
. . rayon  
. . Vycor  
. wool  
RT boron reinforced materials  
carbon fiber reinforced plastics



## fibers (mathematics)

composite materials  
cordage  
cotton  
fabrics  
fiber pullout  
fiber pushout  
∞ filaments  
glass fiber reinforced plastics  
metal matrix composites  
netting (materials/structures)  
papers  
polymeric films  
reinforcing materials  
slivers  
strands  
textiles  
wet spinning  
whiskers (crystals)  
yarns

### fibers (mathematics)

RT canonical forms  
dimensional analysis  
function space  
group theory  
homotopy theory  
manifolds (mathematics)  
topology

### Fibonacci numbers

RT number theory  
∞ numbers  
set theory

### fibrillation

GS heart function  
. fibrillation  
RT heart diseases  
muscles  
seismocardiography

### fibrin

GS biopolymers  
. proteins  
. . fibrin  
body fluids  
. blood  
. . fibrin  
organic compounds  
. proteins  
. . fibrin  
RT blood coagulation  
coagulation  
fibrinogen  
thrombin

### fibrinogen

GS biopolymers  
. proteins  
. . globulins  
. . . fibrinogen  
body fluids  
. blood  
. . fibrinogen  
organic compounds  
. proteins  
. . globulins  
. . . fibrinogen  
RT fibrin  
hemostatics  
homeostasis  
thrombin

### fibroblasts

GS cells (biology)  
. fibroblasts  
RT cytoplasm  
osteoblasts  
tendons  
tissues (biology)

### fibrosis

GS diseases  
. fibrosis  
. . cystic fibrosis

RT tissues (biology)

### fibrous materials

USE **fibers**

### Ficks equation

RT diffusion  
diffusion coefficient  
∞ equations  
reaction-diffusion equations  
Tafel law

### fidelity

USE **accuracy**

### fiduciaries

RT economics  
finance  
management

### field aligned currents

(added September 1988)

DEF Electric currents aligned along magnetic fields.

GS electric current  
. field aligned currents  
. . Birkeland currents

RT aeronomy  
atmospheric electricity  
Earth ionosphere  
Earth magnetosphere  
geoelectricity  
geomagnetic tail  
geomagnetism  
geophysics  
ionospheric currents  
lines of force  
magnetic field reconnection  
Pedersen currents  
plasma currents  
telluric currents  
upper atmosphere

### field army ballistic missiles

GS missiles  
. ballistic missiles  
. . field army ballistic missiles  
RT intermediate range ballistic missiles  
short range ballistic missiles

### field coils

GS electric coils  
. magnetic coils  
. . field coils  
RT electromagnets  
helical inducers  
magnet coils

### field effect transistors

UF *cascode MOSFET*  
*FET (transistors)*  
*IGFET*  
*MESFETs*  
*MISFETs*  
*MOSFET*

GS *unipolar transistors*  
electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . transistors  
. . . . field effect transistors  
. . . . . charge flow devices  
. . . . . JFET  
. . . . . MODFETS  
RT cascode devices  
∞ effects  
high electron mobility transistors  
indium aluminum arsenides  
ion implantation  
SOI (semiconductors)

### field emission

GS emission  
. particle emission  
. . electron emission  
. . . field emission  
RT electric fields  
electron microscopes  
electron microscopy  
magnetic fields

scanning electron microscopy  
secondary emission  
transmission electron microscopy  
Zener effect

### field intensity meters

SN (EMPLOY THIS TERM WHEN TYPE OF FIELD INVOLVED IS NOT SPECIFIED—OTHERWISE USE A MORE SPECIFIC TERM)  
GS measuring instruments  
. field intensity meters  
RT actinometers  
flux density  
magnetometers  
noise meters

### field mode theory

RT cavity resonators  
dielectrics  
electromagnetic fields  
laser modes  
optical resonators  
propagation modes  
∞ theories

### field of view

DEF The area or solid angle that can be viewed through or scanned by an optical instrument.  
GS viewing  
. field of view  
RT bearing (direction)  
conical scanning  
elevation angle  
∞ fields  
look angles (tracking)  
visual fields

### field sails

USE **magnetic sails**

### field strength

DEF For any physical field, the flux density, intensity, or gradient of the field at the point in question.

GS field strength  
. electric field strength  
. magnetic flux  
RT acoustic properties  
directivity  
electric fields  
electrical properties  
electromagnetic fields  
flux density  
gravitational fields  
isotropy  
magnetic diffusion  
magnetic fields  
magnetic properties  
∞ orientation  
permittivity  
∞ strength

### field tests

(added November 1998)

SN (EXCLUDES TESTS OF ELECTRIC, MAGNETIC, OR ELECTROMAGNETIC FIELDS)  
DEF Tests carried out in the actual setting in which the subject device is intended to operate.  
RT environmental tests  
performance tests  
∞ tests

### field theory (algebra)

GS field theory (algebra)  
. cubic equations  
. quadratic equations  
RT ∞ fields  
Green's functions  
homomorphisms  
nonlinear equations  
∞ theories

### field theory (physics)

UF *ambit*  
*force fields*  
*Wightman theory*  
GS field theory (physics)  
. crystal field theory  
. gauge theory

- . . quantum chromodynamics
- . . unified field theory
- . . . electroweak model
- . . . standard model (particle physics)
- . grand unified theory
- RT antenna radiation patterns
- attraction
- boson fields
- closure law
- crossed fields
- Dirac equation
- distribution (property)
- ∞ dynamics
- electromagnetic fields
- far fields
- ∞ fields
- flow distribution
- flux (rate)
- flux density
- function space
- geomagnetism
- gravitational fields
- Green's functions
- light-cone expansion
- magnetic field inversions
- magnetic fields
- magnetostatic fields
- many body problem
- multipolar fields
- nuclear physics
- null zones
- ∞ physics
- Pomeranchuk theorem
- potential fields
- pressure distribution
- quantum electrodynamics
- quantum theory
- radiation distribution
- relativity
- self consistent fields
- sound fields
- string theory
- strong interactions (field theory)
- supergravity
- supersymmetry
- temperature distribution
- tensors
- ∞ theories
- traveling charge
- weak interactions (field theory)
- Yang-Mills fields
- Yang-Mills theory
- zero point energy

**field-programmable gate arrays**

(added April 2000)

- GS circuits
  - . gates (circuits)
  - . . **field-programmable gate arrays**
  - . integrated circuits
  - . . **field-programmable gate arrays**
  - reconfigurable hardware
  - . programmable logic devices
  - . . **field-programmable gate arrays**
- RT evolvable hardware

∞ **fields**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT boson fields
- electric fields
- field of view
- field theory (algebra)
- field theory (physics)
- gravitational fields
- magnetic fields
- military air facilities
- self consistent fields
- visual fields

**fighter aircraft**

- UF *Interceptor aircraft*
- GS attack aircraft
  - . **fighter aircraft**
  - . . Alpha jet aircraft
  - . . DH 112 aircraft
  - . . F-2 aircraft
  - . . F-4 aircraft
  - . . F-5 aircraft

- . . F-8 aircraft
- . . F-9 aircraft
- . . F-14 aircraft
- . . F-15 aircraft
- . . F-16 aircraft
- . . F-17 aircraft
- . . F-18 aircraft
- . . F-20 aircraft
- . . F-22 aircraft
- . . F-84 aircraft
- . . F-86 aircraft
- . . F-89 aircraft
- . . F-94 aircraft
- . . F-100 aircraft
- . . F-101 aircraft
- . . F-102 aircraft
- . . F-104 aircraft
- . . F-105 aircraft
- . . F-106 aircraft
- . . F-117A aircraft
- . . FV-12A aircraft
- . . G-91 aircraft
- . . G-95/4 aircraft
- . . GA-5 aircraft
- . . Harrier aircraft
- . . Jaguar aircraft
- . . JAS-39 aircraft
- . . jet provost aircraft
- . . MiG aircraft
- . . Mirage aircraft
- . . . Mirage 3 aircraft
- . . P-51 aircraft
- . . P-1127 aircraft
- . . P-1154 aircraft
- . . Saab 37 aircraft
- . . Scimitar aircraft
- . . Vampire MK 35 aircraft
- . . YF-12 aircraft

- RT ∞ aircraft
  - highly maneuverable aircraft
  - ∞ interceptors
  - jet aircraft
  - ∞ military aircraft
  - ∞ military aviation
  - MRCA aircraft
  - single engine aircraft
  - STOVL aircraft
  - supersonic aircraft
  - training aircraft
  - V/STOL aircraft
  - X-31 aircraft

**figure of merit**

- RT acceptability
- ∞ analyzing
- criteria
- efficiency
- evaluation
- modulation transfer function
- optical transfer function
- ∞ performance
- Q factors
- quality
- selection
- value

**filament winding**

- UF *filament wound construction*
- GS winding
  - . **filament winding**
- RT ceramic fibers
- composite wrapping
- fiber composites
- isotensoid structures
- laminates
- metal fibers
- netting (materials/structures)
- preimpregnation

*filament wound construction*

USE **filament winding**

∞ **filaments**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT boron fibers
- carbon fibers
- cathodes
- ceramic fibers

- cordage
- fibers
- ionizers
- reinforcing materials
- resistors
- strands
- vortex filaments
- wet spinning
- whiskers (crystals)
- wire

*filaments (solar physics)*

USE **solar prominences**

**file maintenance (computers)**

- GS maintenance
  - . **file maintenance (computers)**
- RT checkout
- computer programming
- computers
- program verification (computers)
- programmers
- ∞ programming

∞ **files**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT document storage
- files (tools)

**files (tools)**

- GS tools
  - . **files (tools)**
- RT abrasion
- ∞ files
- scrapers

**fillers**

- RT additives
- ∞ cells
- dopes
- opacifiers
- paints
- pigments
- primers (coatings)
- reinforcement (structures)
- resins
- sealers
- sizing materials
- varnishes

**fillets**

- RT fairings
- joints (junctions)
- seams (joints)
- welding

**filling**

- GS **filling**
  - . refilling
- RT accumulations
- ∞ charging
- extensions
- injection
- input
- ∞ loading
- replenishment
- supplying

**film boiling**

- GS phase transformations
  - . vaporizing
  - . . boiling
  - . . . **film boiling**
- RT heat transfer
- Leidenfrost phenomenon
- nucleate boiling

**film condensation**

- GS condensing
  - . **film condensation**
- RT condensers (liquefiers)
- cooling
- heat transfer

**film cooling**

DEF The cooling of a body or surface, such as the inner surface of a rocket combustion chamber, by maintaining a thin fluid layer over the affected area.

## film thickness

- GS cooling
  - . evaporative cooling
  - . . **film cooling**
  - . liquid cooling
  - . . **film cooling**
- RT liquid injection
- surface cooling
- sweat cooling

### film thickness

- GS dimensions
  - . **film thickness**
- RT ellipsometry
  - thickness

### ∞ films

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT biofilms
- coatings
- corrosion prevention
- electrode film barriers
- fabrics
- fluid films
- helium film
- Kapton (trademark)
- laminates
- Langmuir-Blodgett films
- magnetic films
- membranes
- metal films
- monomolecular films
- oxide films
- papers
- photographic film
- polymeric films
- semiconducting films
- silicon films
- squeeze films
- superconducting films
- thermoplastic films
- thick films
- thin films
- video tapes
- webs (sheets)

### filter wheel infrared spectrometers

- GS measuring instruments
  - . optical measuring instruments
  - . . infrared spectrometers
  - . . . **filter wheel infrared spectrometers**
  - . radiation measuring instruments
  - . . actinometers
  - . . . infrared spectrometers
  - . . . . **filter wheel infrared spectrometers**
  - . . infrared instruments
  - . . . infrared spectrometers
  - . . . . **filter wheel infrared spectrometers**
  - . spectrometers
  - . . infrared spectrometers
  - . . . **filter wheel infrared spectrometers**
  - optical equipment
  - . optical measuring instruments
  - . . infrared spectrometers
  - . . . **filter wheel infrared spectrometers**
- RT Ebert spectrometers
- ∞ filters
- infrared spectrophotometers
- solar spectrometers

### filtergrams

- RT optical filters
- solar instruments
- solar physics
- solar spectra

### filtering

USE **filtration**

### ∞ filters

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT absorbers (materials)
- adaptive filters

- air filters
- attenuators
- bandpass filters
- bandstop filters
- birefringent filters
- crystal filters
- digital filters
- electric filters
- electromagnetic wave filters
- electronic filters
- filter wheel infrared spectrometers
- FIR filters
- fluid filters
- Gabor filters
- high pass filters
- image filters
- Kalman filters
- linear filters
- low pass filters
- matched filters
- monochromatic radiation
- nonlinear filters
- optical filters
- radar filters
- radio filters
- reduced order filters
- separators
- spatial filtering
- tunable filters

### filtration

- UF *filtering*
- GS **filtration**
  - . spatial filtering
- RT activated carbon
- beds (process engineering)
- beneficiation
- concentrating
- ∞ concentration
- concentrators
- effluents
- extraction
- fluid filters
- hydrometallurgy
- materials recovery
- percolation
- precipitation (chemistry)
- ∞ screening
- ∞ separation
- sewage treatment
- size separation
- water treatment

### finance

- RT accounting
- commerce
- fiduciaries
- gross national product
- investments
- management planning
- marketing
- risk
- wage surveys

### financial management

- GS management
  - . **financial management**
- RT aircraft production costs
- allocations
- budgeting
- cost analysis
- cost estimates
- costs
- economy
- federal budgets
- launch costs
- life cycle costs
- procurement management

### ∞ fine

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT fine structure
- fineness
- fineness ratio
- fines

### fine structure

- UF *multiplets*

- RT alpha decay
- atomic structure
- ∞ fine
- hyperfine structure
- line spectra
- spectral energy distribution
- ∞ structures

### fineness

- RT coarseness
- ∞ fine
- fineness ratio
- particle size distribution
- purity
- quality
- size (dimensions)
- textures

### fineness ratio

DEF The ratio of the length of a body to its maximum diameter or to some equivalent dimension -- said especially of a body such as an airship hull or rocket.

- GS ratios
  - . aspect ratio
  - . . **fineness ratio**
- RT dimensional analysis
- dimensions
- ∞ fine
- fineness
- oblate spheroids
- shape optimization
- slender bodies
- thickness ratio

### fines

- GS particles
  - . powder (particles)
  - . . **fines**
- RT ∞ fine
- ∞ flour
- fractions
- particle size distribution
- ∞ screening

### fingers

- GS anatomy
  - . limbs (anatomy)
  - . . hand (anatomy)
  - . . . **fingers**
  - appendages
  - . hand (anatomy)
  - . . **fingers**
- RT sense organs

### fingers (robotics)

USE **end effectors**

### finishes

- GS **finishes**
  - . enamels
  - . glazes
  - . lacquers
- RT ceramic coatings
- coatings
- corrosion
- dopes
- impregnating
- luster
- machining
- metallizing
- paints
- plating
- polishing
- primers (coatings)
- protective coatings
- sizing (surface treatment)
- sprayed coatings
- surface finishing
- surface properties
- varnishes
- veneers
- waxes

### finite difference theory

- GS analysis (mathematics)
  - . numerical analysis
  - . . approximation
  - . . . **finite difference theory**

... finite difference time domain method  
 RT computational aeroacoustics  
 Crank-Nicholson method  
 difference equations  
 differences  
 essentially non-oscillatory schemes  
 extrapolation  
 flux difference splitting  
 flux vector splitting  
 Godunov method  
 grid generation (mathematics)  
 interpolation  
 multigrid methods  
 perfectly matched layers  
 significance  
 ∞ theories  
 time marching  
 TVD schemes  
 upwind schemes (mathematics)  
 vortex in cell technique

**finite difference time domain method**  
 (added April 1999)  
 UF *FDTD (mathematics)*  
 GS analysis (mathematics)  
 . numerical analysis  
 . . approximation  
 . . . finite difference theory  
 . . . . **finite difference time domain method**  
 . time domain analysis  
 . . **finite difference time domain method**  
 RT computational electromagnetics  
 electromagnetic scattering

**finite element method**  
 UF *hybrid-Trefftz finite element method*  
 GS analysis (mathematics)  
 . numerical analysis  
 . . approximation  
 . . . **finite element method**  
 procedures  
 . **finite element method**  
 RT ∞ applications of mathematics  
 boundary value problems  
 Cholesky factorization  
 computational fluid dynamics  
 computational mechanics  
 conjugates  
 Crank-Nicholson method  
 factorization  
 fracture mechanics  
 grid generation (mathematics)  
 isoparametric finite elements  
 iterative solution  
 matrices (mathematics)  
 meshfree methods  
 ∞ methodology  
 Mindlin plates  
 minimal surfaces  
 multigrid methods  
 NASTRAN  
 panel method (fluid dynamics)  
 patch tests  
 perfectly matched layers  
 shape functions  
 solid mechanics  
 Trefftz method  
 unstructured grids (mathematics)

*finite impulse response filters*  
 USE **FIR filters**

**finite volume method**  
 DEF A moving mesh method for analyzing transonic flow over airfoils.  
 GS analysis (mathematics)  
 . numerical analysis  
 . . **finite volume method**  
 . . . Godunov method  
 procedures  
 . **finite volume method**  
 . . Godunov method  
 RT boundary value problems  
 ∞ methodology  
 TVD schemes

unstructured grids (mathematics)

*finite-state machines*  
 USE **Turing machines**

**Finland**  
 GS nations  
 . **Finland**  
 RT Europe  
 Finnish space program  
 Scandinavia

**finned bodies**  
 RT aerodynamic configurations  
 ∞ bodies  
 bodies of revolution  
 cooling fins  
 fins  
 heat exchangers  
 missile bodies  
 nose fins  
 projectiles  
 symmetrical bodies

**Finnish space program**  
 (added November 1990)  
 GS programs  
 . space programs  
 . . European space programs  
 . . . **Finnish space program**  
 RT Finland

**fins**  
 DEF Fixed or adjustable airfoils or vanes attached longitudinally to an aircraft, rocket, or a similar body to provide a stabilizing effect. Also, a flat plate of structure, as a cooling fin. Used for vertical fins.  
 UF *vertical fins*  
 GS **fins**  
 . cooling fins  
 . nose fins  
 RT aerial rudders  
 airfoils  
 airframes  
 ∞ blades  
 control surfaces  
 finned bodies  
 hydrofoils  
 missile components  
 rudders  
 sails  
 stabilizers (fluid dynamics)  
 tail assemblies  
 vanes  
 winglets

**fiords**  
 DEF Arms of the sea having steep sides, deep bottoms, and shallow sills separating them from the sea.  
 GS landforms  
 . **fiords**  
 RT cliffs  
 geology  
 inlets (topography)  
 Norway  
 oceanography  
 water

**FIR filters**  
 DEF Physically unrealizable nonrecursive digital filters. Used for finite impulse response filters.  
 UF *finite impulse response filters*  
 GS electromagnetic wave filters  
 . electric filters  
 . . digital filters  
 . . . **FIR filters**  
 RT bandpass filters  
 electronic filters  
 ∞ filters  
 IIR filters  
 microwave filters  
 radar filters  
 recursive functions

**FIRE (climatology)**  
 (added August 1991)  
 UF *First ISCCP Regional Experiment*

GS programs  
 . projects  
 . . **FIRE (climatology)**  
 RT climatology  
 cloud cover  
 clouds (meteorology)  
 remote sensing  
 satellite observation

**fire control**  
 SN (LIMITED TO CONTROL OF THE FIRING OF WEAPONS--EXCLUDES FIRE PREVENTION AND FIRE FIGHTING)  
 RT bombing equipment  
 ∞ control  
 firing (igniting)  
 gunfire  
 gunnery training  
 range finders  
 weapon systems  
 weapons

**fire control circuits**  
 GS circuits  
 . **fire control circuits**  
 RT ∞ control

**fire damage**  
 GS damage  
 . **fire damage**  
 RT ashes  
 charring  
 combustion  
 fires  
 flames  
 fumes  
 smoke  
 soot

**fire extinguishers**  
 UF *chemical extinguishers*  
*extinguishers*  
 RT fire fighting  
 fire prevention  
 firebreaks  
 fires  
 flammability  
 foams  
 halon

**fire fighting**  
 SN (EXCLUDES FIRE CONTROL--CONTROL OF THE FIRING OF WEAPONS)  
 RT breathing apparatus  
 fire extinguishers  
 fire prevention  
 firebreaks  
 fires  
 flammability  
 foams

**fire point**  
 RT flammability  
 flash point  
 spontaneous combustion

**fire prevention**  
 SN (EXCLUDES FIRE CONTROL--CONTROL OF THE FIRING OF WEAPONS)  
 GS prevention  
 . **fire prevention**  
 RT accident prevention  
 explosion suppression  
 fire extinguishers  
 fire fighting  
 firebreaks  
 fireproofing  
 fires  
 flame retardants  
 forest fires  
 high pressure oxygen  
 safety  
 safety devices  
 safety management  
 smoke detectors  
 spontaneous combustion  
 warning

## fireballs

warning systems

*fire resistance*

USE **flammability**

*fire retardants*

USE **flame retardants**

### ∞ fireballs

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT bolides  
nuclear explosions

### Firebee 2 target drone aircraft

GS drone vehicles  
. drone aircraft  
. . target drone aircraft  
. . . **Firebee 2 target drone aircraft**  
light aircraft  
. **Firebee 2 target drone aircraft**  
pilotless aircraft  
. drone aircraft  
. . target drone aircraft  
. . . **Firebee 2 target drone aircraft**  
research vehicles  
. research aircraft  
. . **Firebee 2 target drone aircraft**  
Ryan aircraft  
. **Firebee 2 target drone aircraft**  
supersonic aircraft  
. **Firebee 2 target drone aircraft**

RT ∞ aircraft  
∞ military aircraft  
targets  
∞ winged vehicles

### firebreaks

GS clearings (openings)  
. **firebreaks**

RT combustion  
conservation  
fire extinguishers  
fire fighting  
fire prevention  
fires  
flames  
forest fires  
forests

### fireflies

DEF Flying insects which produce light by bioluminescence.

GS animals  
. invertebrates  
. . arthropods  
. . . insects  
. . . . **fireflies**

### fireproofing

RT fire prevention  
nonflammable materials  
safety

### fires

GS **fires**  
. forest fires

RT accidents  
backfire  
burns (injuries)  
combustion  
control surfaces  
deflagration  
explosions  
explosives  
fire damage  
fire extinguishers  
fire fighting  
fire prevention  
firebreaks  
firing (igniting)  
flames  
flashback  
hazards  
safety  
Saint Elmo fire  
smoldering

warning systems

### firewalls (computers)

(added January 2003)

DEF Computers, routers, and/or communications devices that filter access to a protected network. They may also consist of a collaboration of such components geared toward protecting networks from intrusion from the Internet while allowing users inside the network access to services on the Internet, such as Web and e-mail services.

GS security  
. computer security  
. . **firewalls (computers)**

RT access control  
computer information security  
computer networks  
computer systems design  
intrusion detection (computers)

*fireworks*

USE **pyrotechnics**

### firing (igniting)

GS **firing (igniting)**  
. rocket firing  
. . retrofiring  
. . test firing  
. . . static firing

RT burning time  
detonable gas mixtures  
detonation  
drying  
fire control  
fires  
flammable gases  
gunfire  
ignition  
pulsejet engines  
starting

*firing time*

USE **burning time**

### firmware

DEF Hardwired software which often encompasses microcodes.

RT computer components  
computer programming  
∞ hardware  
microprocessors  
microprogramming  
RISC processors

### first aid

RT accidents  
chemical defense  
cures  
disasters  
kits  
medical equipment  
medical science  
medical services  
resuscitation  
splints  
stretchers  
tourniquets  
transfusion

*First ISCCP Regional Experiment*

USE **FIRE (climatology)**

### Fischer-Tropsch process

RT catalysis  
catalytic activity  
reaction kinetics  
synthesis (chemistry)  
synthetic fuels

*fish*

USE **fishes**

### Fishbowl Operation

RT high altitude tests  
nuclear explosions  
∞ operations  
Vela satellites

### Fisher information

(added March 2004)

DEF A fundamental quantity in statistical inference that describes an attribute or property of a distribution with known form but uncertain parameter values.

RT Cramer-Rao bounds  
expectation  
information theory  
likelihood ratio

### fisheries

DEF Place for harvesting fish or other aquatic life, especially in sea waters.

RT aquaculture  
estuaries  
fishes  
fishing  
marine biology  
marine resources  
sea water  
shallow water  
tidal flats  
wetlands

### fishes

UF *fish*

GS animals  
. vertebrates  
. . **fishes**  
. . . schools (fish)  
. . . sharks

RT aquaculture  
Earth resources  
fisheries  
fishing  
∞ food  
ichthyology  
∞ nutrients  
poikilothermia  
red tide  
squama  
wildlife

### fishing

(added November 1992)

RT fisheries  
fishes  
industries  
schools (fish)

*fish tailing*

USE **yaw**

### fission fuels

GS fissionable materials  
. **fissile fuels**  
fuels  
. nuclear fuels  
. . **fissile fuels**

RT fissium  
gaseous fission reactors  
nuclear fission  
nuclear reactors  
radioactive materials

*fissile materials*

USE **fissionable materials**

### fission

DEF The splitting of an atomic nucleus into two more-or-less equal fragments.

RT blankets (fission reactors)  
fuel production  
nuclear fuels  
splitting

### fission electric cells

GS auxiliary power sources  
. nuclear auxiliary power units  
. . SNAP  
. . . **fission electric cells**  
. . . . SNAP 2  
. . . . SNAP 4  
. . . . SNAP 8  
. . . . SNAP 10A  
. . space power reactors  
. . . **fission electric cells**  
. . . . SNAP 2  
. . . . SNAP 4  
. . . . SNAP 8  
. . . . SNAP 10A

nuclear electric power generation  
 . nuclear auxiliary power units  
 . . SNAP  
 . . . **fission electric cells**  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 . . space power reactors  
 . . . **fission electric cells**  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 . nuclear power reactors  
 . . space power reactors  
 . . . **fission electric cells**  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 nuclear reactors  
 . nuclear power reactors  
 . . space power reactors  
 . . . **fission electric cells**  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 RT ∞ electric cells  
 radioisotope batteries  
 space power unit reactors

**fission products**  
 DEF The large variety of smaller atoms, including cesium and strontium, left over by the splitting of uranium and plutonium, usually caused by the absorption of a neutron.  
 GS products  
 . **fission products**  
 RT chain reactions (nuclear physics)  
 fallout  
 high energy interactions  
 nuclear fission  
 nuclear particles  
 nuclear pumping  
 nuclear radiation  
 radioactive materials  
 radioactive wastes  
 radioactivity

**fission weapons**  
 UF *atomic bombs*  
 GS weapons  
 . nuclear weapons  
 . . **fission weapons**  
 RT fallout  
 nuclear devices  
 thermonuclear explosions

**fissionable materials**  
 DEF Materials containing nuclides capable of undergoing fission only by fast neutrons with energy greater than 1MeV, e.g., thorium-232 and uranium-238. Used for fissile materials.  
 UF *fissile materials*  
 GS **fissionable materials**  
 . fissile fuels  
 RT gaseous fission reactors  
 ∞ materials  
 nozzle flow  
 nuclear fuels  
 plutonium  
 radioactive materials  
 uranium

**fissium**  
 GS fuels  
 . nuclear fuels  
 . . **fissium**  
 RT fissile fuels

**fissures (geology)**  
 DEF Extensive cracks in rocks.  
 RT folds (geology)  
 geological faults  
 structural properties (geology)

tectonics  
**fitness**  
 GS **fitness**  
 . flight fitness  
 . physical fitness  
 RT qualifications

**fitting**  
 RT adaptation  
 adjusting  
 alignment  
 assembling  
 fittings  
 goodness of fit  
 interference fit  
 ∞ joining  
 matching  
 positioning

**fittings**  
 RT accessories  
 adapters  
 closures  
 connectors  
 couplings  
 extensions  
 fasteners  
 fitting  
 inserts  
 joints (junctions)  
 linkages  
 sleeves  
 U bends  
 unions (connectors)

*Fitzgerald-Lorentz contraction*  
 USE **Lorentz contraction**

*fix*  
 USE **fixing**

**fixed point arithmetic**  
 GS number theory  
 . arithmetic  
 . . **fixed point arithmetic**  
 RT computer programs  
 computers  
 data processing

**fixed points (mathematics)**  
 DEF Positional notation in which corresponding places in different quantities are occupied by coefficients of the same power of the base. Notation in which the base point is assumed to remain fixed with respect to one end of the numeric expressions.  
 GS geometry  
 . Euclidean geometry  
 . . points (mathematics)  
 . . . **fixed points (mathematics)**  
 . topology  
 . . **fixed points (mathematics)**  
 RT manifolds (mathematics)  
 mapping

**fixed wings**  
 UF *fixed-wing aircraft*  
 GS airfoils  
 . wings  
 . . **fixed wings**  
 RT cambered wings  
 cruciform wings  
 flexible wings  
 low aspect ratio wings  
 rigid wings  
 slender wings  
 swept wings  
 thin wings  
 twisted wings  
 uncambered wings  
 unswept wings

*fixed-wing aircraft*  
 USE **aircraft configurations**  
**fixed wings**

∞ **fixing**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *fix*  
 RT maintenance  
 navigation  
 position (location)  
 positioning

**fixtures**  
 RT brackets  
 ∞ hardware  
 jigs  
 luminaires  
 tools

**Fizeau effect**  
 RT Doppler effect  
 Doppler-Fizeau effect  
 ∞ effects

**Flagellata**  
 GS animals  
 . protozoa  
 . . **Flagellata**  
 . . . Euglena  
 . . . trypanosome  
 microorganisms  
 . protozoa  
 . . **Flagellata**  
 . . . Euglena  
 . . . trypanosome

**flakes**  
 GS particles  
 . **flakes**  
 RT flaking  
 metal powder  
 powder (particles)

**flaking**  
 RT atomizing  
 chipping  
 comminution  
 cutting  
 disintegration  
 flakes  
 fracturing  
 peeling  
 ∞ separation  
 spalling  
 splitting  
 wear

**flame calorimeters**  
 GS measuring instruments  
 . calorimeters  
 . . **flame calorimeters**  
 RT bomb calorimeters  
 drop calorimeters  
 heat measurement  
 high temperature tests  
 temperature measuring instruments

**flame deflectors**  
 DEF In a vertical launch, any of variously designed obstructions that intercept hot gases of rocket engines so as to deflect them away from the ground or from a structure. In captive tests, elbows in the exhaust conduits or flame buckets that deflect the flame into the open.  
 GS deflectors  
 . **flame deflectors**  
 RT backfire  
 baffles  
 blast deflectors  
 diverters  
 flashback  
 launching pads  
 safety devices  
 shielding  
 test stands

*flame fronts*  
 USE **flame propagation**

**flame holders**  
 GS holders  
 . **flame holders**  
 RT combustion chambers  
 dump combustors  
 flameout

# flame ionization

flames

*flame interaction*  
USE **chemical reactions**  
**flame propagation**

**flame ionization**  
GS ionization  
. gas ionization  
. . **flame ionization**

**flame plating**  
GS plating  
. **flame plating**  
RT coating  
welding

**flame probes**  
GS measuring instruments  
. **flame probes**  
RT gas analysis  
manometers  
temperature measuring instruments

**flame propagation**  
UF *Chapman-Jouget flame*  
*combustion waves*  
*flame fronts*  
*flame interaction*  
GS propagation (extension)  
. **flame propagation**  
RT backfire  
boundary layer combustion  
burning rate  
combustible flow  
combustion  
combustion physics  
Damkohler number  
detonation  
detonation waves  
explosions  
flames  
flammability  
flashback  
gas explosions  
gas-metal interactions  
ignition  
premixed flames  
pressure oscillations  
pressure pulses  
∞ propagation  
reacting flow  
turbulent combustion  
turbulent flames

*flame quenching*  
USE **extinguishing**  
**quenching (cooling)**

**flame retardants**  
UF *fire retardants*  
GS retardants  
. **flame retardants**  
RT antimisting fuels  
fabrics  
fire prevention  
flammability  
halon  
ignition limits  
inorganic compounds  
polybrominated biphenyls  
synthetic fibers

**flame spectroscopy**  
GS spectroscopy  
. **flame spectroscopy**  
spectrum analysis  
. **flame spectroscopy**  
RT emission spectra  
gas spectroscopy  
line spectra  
optogalvanic spectroscopy  
qualitative analysis  
spectroscopic analysis

**flame spraying**  
GS spraying  
. **flame spraying**  
. . HVOF thermal spraying  
RT coating

coatings  
metal spraying  
metallizing  
plasma spraying

**flame stability**  
GS dynamic characteristics  
. dynamic stability  
. . combustion stability  
. . . **flame stability**  
. . motion stability  
. . . flow stability  
. . . . **flame stability**  
. flow characteristics  
. . flow stability  
. . . **flame stability**  
stability  
. dynamic stability  
. . combustion stability  
. . . **flame stability**  
. . motion stability  
. . . flow stability  
. . . . **flame stability**  
RT flameout  
turbulent flames

**flame temperature**  
GS temperature  
. **flame temperature**  
RT combustion chemistry  
combustion temperature

**flameout**  
DEF Unintended loss of combustion in turbine engines resulting in the loss of engine power.  
UF *blowoff (combustion)*  
GS extinguishing  
. **flameout**  
RT combustion  
combustion chambers  
flame holders  
flame stability  
gas turbine engines  
jet engines

**flames**  
UF *jet flames*  
*laminar flames*  
GS **flames**  
. diffusion flames  
. premixed flames  
. turbulent flames  
RT combustion  
fire damage  
firebreaks  
fires  
flame holders  
flame propagation  
∞ flares  
forest fires  
fuels  
smog  
turbulent combustion

**flammability**  
DEF Those characteristics of a material that pertain to its relative ease of ignition and relative ability to sustain combustion. Used for combustibility and fire resistance.  
UF *combustibility*  
*fire resistance*  
RT burning rate  
combustion  
detonable gas mixtures  
fire extinguishers  
fire fighting  
fire point  
flame propagation  
flame retardants  
flammable gases  
flash point  
ignition  
ignition limits  
ignition temperature  
pyrophoric materials  
∞ resistance  
smoldering

spontaneous combustion

**flammable gases**  
UF *explosive gases*  
GS gases  
. **flammable gases**  
. . gaseous fuels  
. . . natural gas  
. . . . liquefied natural gas  
. . . . liquefied natural gas  
. . pyrogen  
RT chemical explosions  
detonable gas mixtures  
explosives  
firing (igniting)  
flammability  
gas explosions  
hazards

**flange wrinkling**  
GS wrinkling  
. **flange wrinkling**  
RT buckling

**flanges**  
RT connectors  
metal plates

*flap control*  
USE **aircraft control**  
**flaps (control surfaces)**

**flaperons**  
DEF Airplane control surfaces that serve the function of both aileron and flap.  
GS airfoils  
. ailerons  
. . **flaperons**  
. . flaps (control surfaces)  
. . **flaperons**  
control surfaces  
. ailerons  
. . **flaperons**  
. . flaps (control surfaces)  
. . . **flaperons**  
RT aerodynamic brakes

**flapping**  
RT airfoil oscillations  
flutter  
resonant vibration  
rotor aerodynamics  
shaking  
undamped oscillations  
vibration  
wing oscillations

**flapping hinges**  
GS hinges  
. **flapping hinges**  
RT rotary wings  
rotor aerodynamics

**flaps (control surfaces)**  
UF *flap control*  
GS airfoils  
. **flaps (control surfaces)**  
. . externally blown flaps  
. . . upper surface blown flaps  
. . flaperons  
. . jet flaps  
. . split flaps  
. . wing flaps  
. . . leading edge flaps  
. . . leading edge slats  
. . . trailing edge flaps  
. . . vortex flaps  
control surfaces  
. **flaps (control surfaces)**  
. . externally blown flaps  
. . . upper surface blown flaps  
. . flaperons  
. . jet flaps  
. . split flaps  
. . wing flaps  
. . . leading edge flaps  
. . . leading edge slats  
. . . trailing edge flaps  
. . . vortex flaps  
RT aerodynamic brakes

- brakes (for arresting motion)
- ∞ control
  - drag devices
  - GAW-2 airfoil
  - lift devices
  - spoilers
- ∞ surfaces

**flare stars**

- DEF Members of a class of dwarf stars that show sudden intensive outbursts of energy. Used for UV Ceti stars.
- UF *UV Ceti stars*
- GS celestial bodies
  - . stars
  - . . late stars
  - . . . cool stars
  - . . . . **flare stars**
  - . . main sequence stars
  - . . . dwarf stars
  - . . . . **flare stars**
  - . . variable stars
  - . . . **flare stars**
- RT cataclysmic variables
  - M stars
  - solar flares
  - stellar activity
  - stellar flares
  - symbiotic stars

**flared bodies**

- RT afterbodies
  - aircraft configurations
- ∞ flares
  - spacecraft configurations
  - symmetrical bodies

∞ **flares**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT flames
  - flared bodies
  - illuminating
  - lighting equipment
  - luminaires
  - pyrotechnics
  - runway lights
  - solar flares
  - Solar Maximum Mission
  - solar terrestrial interactions
  - stellar activity
  - stellar flares

∞ **flash**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *light duration*
- RT electric discharges
  - explosions
  - flash welding
  - flashing (vaporizing)
  - light (visible radiation)
  - radiography
  - solar flares

**flash blindness**

- GS blindness
  - . **flash blindness**
- RT eye protection
  - light adaptation
  - vision

**flash lamps**

- UF *flash tubes*
- GS lighting equipment
  - . luminaires
  - . . **flash lamps**
  - . . . alkali vapor lamps
- RT light sources
  - xenon lamps

**flash point**

- DEF The temperature at which a substance, such as fuel oil, will give off a vapor that will flash or burn momentarily when ignited.
- GS temperature
  - . ignition temperature
  - . . **flash point**
- RT combustion temperature

- fire point
- flammability
- ignition
- spontaneous combustion
- vapor pressure
- volatility

*flash tubes*

USE **flash lamps**

**flash welding**

- GS welding
  - . fusion welding
  - . . electric welding
  - . . . **flash welding**
- RT ∞ flash
  - pressure welding

**flashback**

- DEF Backward burning of a flame into the lip of a burner or torch.
- RT backfire
  - combustion
  - deflagration
  - explosions
  - fires
  - flame deflectors
  - flame propagation

**flashing (vaporizing)**

- DEF The evaporation of a heated liquid as a consequence of rapid pressure reduction.
- GS phase transformations
  - . vaporizing
  - . . **flashing (vaporizing)**
- RT distillation
  - evaporation
  - ∞ flash
    - prevaporization
    - ∞ separation

**flashover**

- GS electric current
  - . electric discharges
  - . . **flashover**
- RT electric arcs
  - electric sparks
  - electrical faults
  - failure

**flasks**

- RT bottles
  - glassware

*flat coaxial transmission lines*

USE **microstrip transmission lines**

**flat conductors**

- GS conductors
  - . **flat conductors**
  - . . beam leads
- RT bus conductors
  - circuits
  - connectors
  - electric connectors
  - electric contacts
  - electric wire
  - wire
  - wiring

**flat layers**

- RT flatness
  - ∞ layers
  - planar structures
  - strata
  - stratification

**flat panel displays**

(added September 1994)

- GS display devices
  - . **flat panel displays**
- RT avionics
  - consoles
  - human factors engineering
  - imaging techniques
  - indicating instruments

**flat patterns**

- DEF Shape of a part or parts put in 3 space in its undefined condition.
- RT castings

molds

**flat plates**

- GS structural members
  - . plates (structural members)
  - . . **flat plates**
- RT annular plates
  - Blasius equation
  - Blasius flow
  - circular plates
  - dynamic structural analysis
  - end plates
  - flatness
  - fluid mechanics
  - heat transfer
  - metal plates
  - panels
  - parallel plates
  - planar structures
  - plate theory
  - ∞ plates
    - rectangular plates
  - ∞ sheets
    - slabs
    - thick plates
    - thin plates

**flat surfaces**

- UF *facets*
- RT Cosserat surfaces
  - flatness
  - planar structures
  - ∞ surface geometry
  - surface properties
  - ∞ surfaces

**flatness**

- GS shapes
  - . **flatness**
- RT concavity
  - contours
  - convexity
  - etalons
  - flat layers
  - flat plates
  - flat surfaces
  - flattening
  - interferometers
  - mechanical properties
  - planar structures
  - roughness
  - ∞ surface geometry

**flats (landforms)**

- DEF A general term for level or nearly level surfaces or small areas of land marked by little or no relief such as plains. Also, nearly level regions that visibly display lower relief than their surroundings. Used for adobe flats and salt flats.
- UF *adobe flats*
- salt flats*
- GS landforms
  - . **flats (landforms)**
  - . . tidal flats
- RT Earth resources
  - marshlands
  - mesas
  - plains
  - salt beds

**flattening**

- RT ductility
  - ellipticity
  - flatness
  - leveling
  - metal working
  - oblate spheroids
  - ∞ rolling
    - smoothing

**flatworms**

- GS animals
  - . invertebrates
  - . . worms
  - . . . **flatworms**
- RT infestation

**flavor (particle physics)**

- DEF The specific identifiers of quarks which



## **fleet ballistic missiles**

distinguish various combinations of electric charge and mass.

- RT hadrons
- particle interactions
- particle theory
- ∞ physics
- quantum theory
- quark models
- quarks
- theoretical physics

*flaw detection*

USE **nondestructive tests**

*flaws*

USE **defects**

### **fleet ballistic missiles**

- UF *FBM (missiles)*
- GS missiles
  - . surface to surface missiles
  - . . . **fleet ballistic missiles**
  - . . . . Polaris A1 missile
  - . . . . Polaris A2 missile
  - . . . . Polaris A3 missile
  - . . . . Poseidon missiles
  - . . . . Subroc missile
- RT ballistic missile submarines
- guided missile submarines
- intercontinental ballistic missiles
- intermediate range ballistic missiles
- sea launching

### **Fleet Satellite Communication System**

DEF Global communication system utilizing satellites. Used for FLEETSATCOM and FLT-SATCOM.

- UF *Fleetsatcom*
- Fltatcom*
- GS telecommunication
  - . Defense Communications Satellite System
  - . . . **Fleet Satellite Communication System**
- RT communication satellites
- Marisat satellites
- microwave transmission
- military technology
- NASCOM network
- navy
- radio communication
- ∞ systems
- ultrahigh frequencies

*Fleetsatcom*

USE **Fleet Satellite Communication System**

### **flexibility**

DEF That property of a material by virtue of which it may be bowed repeatedly without undergoing rupture. That property of a material by virtue of which it may be flexed or bowed repeatedly without undergoing rupture. Used for nonrigidity.

- UF *nonrigidity*
- GS mechanical properties
  - . **flexibility**
- RT bending
- elastic properties
- flexing
- nonuniformity
- plastic properties
- ∞ rigidity
- softness
- stiffness
- versatility

### **flexible bodies**

- GS **flexible bodies**
  - . flexible spacecraft
- RT ∞ bodies
- hybrid structures
- inflatable structures

### **flexible spacecraft**

DEF Space vehicles (usually space structures or rotating satellites) whose surfaces and/or appendages may be subject to elastic flexural deformations (vibrations).

- GS aerospace vehicles
  - . **flexible spacecraft**
  - flexible bodies
  - . **flexible spacecraft**
- RT artificial satellites
- displacement
- elastic deformation
- flexing
- large space structures
- satellite control
- satellite orientation
- satellite rotation
- shape control
- ∞ spacecraft
- spacecraft control
- spacecraft motion
- structural vibration
- vibration damping

### **flexible wings**

- UF *Rogallo wings*
- GS airfoils
  - . wings
  - . . . **flexible wings**
  - . . . . parawings
- RT fixed wings
- gliders
- hang gliders
- infinite span wings
- inflatable structures
- rigid wings
- thin wings
- twisted wings
- XV-8A aircraft

### **flexing**

- UF *flexure*
- RT bending
- camber
- ∞ chambers
- curvature
- deflection
- deformation
- distortion
- flexibility
- flexible spacecraft
- folding
- heaving
- loading moments

### **flexors**

- GS anatomy
  - . musculoskeletal system
  - . . muscles
  - . . . **flexors**
- RT joints (anatomy)

*Flexowriters (trademark)*

USE **automatic typewriters**

### **flexural strength**

(added September 1995)

DEF DEF The bending load that a material can withstand without fracturing - it's resistance to fracture.

- UF *bending strength*
- GS mechanical properties
  - . fracture strength
  - . . **flexural strength**
- RT bend tests
- bending fatigue
- static loads
- ∞ strength

*flexure*

USE **flexing**

### **flicker**

- RT critical flicker fusion
- light transmission

*flicker fusion frequency*

USE **critical flicker fusion**

### ∞ **flight**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The movement of an object through the atmosphere or through space, sustained by aerodynamic, aerostatic, or reaction forces, or

by orbital speed; especially the movement of a man-operated or man-controlled device, such as a rocket, a space probe, a space vehicle, or an aircraft. Used for flying, high altitude flight, and high speed flight.

- UF *flying*
- high altitude flight*
- high speed flight*
- RT aerodynamics
- ∞ aeronautics
- balloon flight
- climbing flight
- coasting flight
- cruising flight
- flight altitude
- flight control
- flight mechanics
- flight optimization
- flight paths
- flight safety
- flight tests
- flight time
- formation flying
- free flight
- gliding
- horizontal flight
- hypersonic flight
- long duration space flight
- lunar flight
- meteorological flight
- parabolic flight
- rocket flight
- soaring
- space flight
- steering
- suborbital flight
- supersonic flight
- trajectories
- transition flight
- transoceanic flight
- transonic flight
- turning flight
- vertical flight
- visual flight

### **flight altitude**

- GS altitude
  - . **flight altitude**
- RT air traffic control
- ceiling (aircraft capability)
- ∞ flight
- midaltitude

### **flight characteristics**

DEF Characteristics exhibited by an aircraft, rocket, or the like in flight, such as a tendency to stall or to yaw, or an ability to remain stable at certain speeds. Used for flight performance and flying qualities.

- UF *flight performance*
- flying qualities*
- GS **flight characteristics**
  - . flight envelopes
  - . pilot ratings
  - . . Cooper-Harper ratings
- RT aerodynamics
- aircraft maneuvers
- aircraft performance
- aircraft specifications
- airspeed
- buffeting
- ceiling (aircraft capability)
- ∞ characteristics
- controllability
- flight control
- flutter
- helicopter performance
- highly maneuverable aircraft
- in-flight simulation
- low speed stability
- maneuverability
- ∞ performance
- quality

### **flight clothing**

- GS clothing
  - . **flight clothing**
- RT coveralls
- garments
- goggles

helmets  
pressure suits  
protective clothing

*flight computers*

USE **airborne/spaceborne computers**

**flight conditions**

GS conditions  
. **flight conditions**  
RT aircraft icing  
aviation meteorology  
cloud cover  
cockpit weather information systems  
instrument flight rules  
meteorological services  
storms (meteorology)  
visual flight  
weather forecasting

**flight control**

GS **flight control**  
. automatic flight control  
. . automatic landing control  
. fly by light control  
. fly by tube control  
. fly by wire control  
. thrust vector control  
RT aerobatics  
air traffic control  
aircraft control  
aircraft instruments  
aircraft survivability  
attitude control  
attitude indicators  
automated en route ATC  
automatic control  
automatic pilots  
∞ control  
control configured vehicles  
control stability  
control sticks  
control surfaces  
display devices  
entry guidance (STS)  
∞ flight  
flight characteristics  
flight management systems  
formation flying  
ground based control  
ground support equipment  
guidance (motion)  
helicopter control  
in-flight monitoring  
in-flight simulation  
instrument approach  
instrument landing systems  
maneuverability  
maneuvers  
missile control  
navigation  
navigation aids  
navigation instruments  
pointing control systems  
radio navigation  
remote control  
rocket engine control  
solar compasses  
spacecraft control  
stability augmentation  
turbojet engine control

**flight crews**

UF *aircrews*  
GS personnel  
. crews  
. . **flight crews**  
. . . spacecrews  
. flying personnel  
. . **flight crews**  
. . . spacecrews  
RT aircraft pilots  
crew procedures (inflight)  
crew procedures (preflight)  
crew size  
flight fatigue  
navigators

pilots (personnel)

**flight envelopes**

DEF The bounds within which a certain flight system can operate, especially a graphic representation of these bounds showing interrelationships of operational parameters.

GS flight characteristics  
. **flight envelopes**  
RT aerodynamic characteristics  
aerodynamic stability  
aircraft control  
aircraft maneuvers  
aircraft performance  
aircraft stability  
∞ envelopes  
flight tests  
helicopter performance  
maneuverability  
terrain following

**flight fatigue**

GS fatigue (biology)  
. **flight fatigue**  
RT aerospace medicine  
flight crews  
∞ flight stress  
flight stress (biology)  
pilot performance

**flight fitness**

GS fitness  
. **flight fitness**  
RT ∞ flight stress  
flying personnel  
physical examinations  
physical fitness

**flight hazards**

GS hazards  
. **flight hazards**  
. . meteoroid hazards  
RT air piracy  
air traffic  
aircraft accidents  
aircraft hazards  
aircraft icing  
aircraft safety  
aircraft spin  
aviation meteorology  
bird-aircraft collisions  
birds  
collisions  
crash landing  
crashes  
destruction  
downbursts  
microbursts (meteorology)  
midair collisions  
noise (sound)  
operational hazards  
toxic hazards  
weather

**flight instruments**

GS **flight instruments**  
. approach indicators  
. attitude indicators  
. . gyro horizons  
. automatic pilots  
. flight test instruments  
. horizon scanners  
. radio altimeters  
RT air navigation  
airborne equipment  
aircraft control  
aircraft equipment  
aircraft instruments  
altimeters  
bubble technique  
cockpit weather information systems  
compasses  
display devices  
engine control  
engine monitoring instruments  
head-up displays  
instrument approach  
instrument flight rules  
instrument landing systems  
∞ instruments

landing instruments  
Light Airborne Multipurpose System  
measuring instruments  
navigation instruments  
night flights (aircraft)  
onboard equipment  
position indicators  
radar  
radio direction finders  
rate of climb indicators  
recording instruments  
satellite instruments  
solar compasses  
spacecraft instruments  
spacecraft position indicators  
speed indicators  
star trackers  
TERCOM

**flight load recorders**

GS aircraft instruments  
. flight recorders  
. . **flight load recorders**  
data recorders  
. flight recorders  
. . **flight load recorders**  
measuring instruments  
. flight recorders  
. . **flight load recorders**  
recording instruments  
. flight recorders  
. . **flight load recorders**  
RT strain gages

**flight management systems**

GS management systems  
. **flight management systems**  
RT air navigation  
air traffic control  
airborne/spaceborne computers  
automatic flight control  
automatic landing control  
avionics  
computer techniques  
flight control  
ground based control  
navigation aids  
onboard data processing  
pilot support systems  
situational awareness  
systems engineering

**flight mechanics**

GS mechanics (physics)  
. **flight mechanics**  
RT aerodynamics  
ascent trajectories  
descent trajectories  
∞ flight  
missile trajectories  
orbit calculation  
orbit decay  
orbital mechanics  
∞ platforms  
reentry trajectories  
rendezvous  
rendezvous trajectories  
space flight  
space mechanics  
spacecraft reentry  
spacecraft trajectories  
thrust programming  
trajectories  
trajectory measurement  
trajectory optimization

**flight nurses**

GS personnel  
. medical personnel  
. . **flight nurses**  
RT crews

**flight operations**

DEF Collective term for ground support operations by flight crew or support personnel preparatory to space flight, or tasks performed by crew during flight.

GS **flight operations**  
. crew procedures (inflight)  
RT aircraft maintenance

## flight optimization

- crew procedures (preflight)
- ground handling
- onboard equipment
- preflight operations
- refueling

### flight optimization

- GS optimization
  - . **flight optimization**
- RT burning time
  - Earth-Venus trajectories
- ∞ flight
  - great circles
  - orbital mechanics
  - orbits
  - parking orbits
  - space flight
  - thrust programming
  - trajectories
  - trajectory optimization

### flight paths

DEF Paths made or followed in the air or in space by an aircraft or rocket; the continuous series of positions occupied by a flying body; more strictly, the path of the center of gravity of the flying body, referred to the Earth or other fixed reference.

- GS **flight paths**
  - . glide paths
- RT air navigation
  - air traffic
  - air traffic control
  - aircraft instruments
  - aircraft maneuvers
  - airspace
  - approach
  - approach control
  - area navigation
  - caustic lines
  - climbing flight
  - collision avoidance
  - collisions
  - descent
- ∞ drift
- ∞ flight
  - gliding
  - Global Positioning System
  - great circles
  - ground tracks
  - guidance (motion)
  - horizontal flight
  - missile trajectories
  - National Airspace Utilization System
  - navigation
  - navigation aids
  - orbits
- ∞ paths
  - reentry
  - rocket flight
  - satellite ground tracks
  - solar compasses
  - swath width
  - Tacan
  - trajectories
  - turning flight
  - uncontrolled reentry (spacecraft)
  - vertical flight
  - visual flight

### flight performance

USE **flight characteristics**

### flight plans

- RT air navigation
  - air traffic
  - air traffic control
  - approach
  - instrument flight rules
  - National Airspace Utilization System
- ∞ plans
  - routes
  - thrust programming
  - weather

### flight recorders

- GS aircraft instruments
  - . **flight recorders**
  - . . flight load recorders
  - data recorders

- . **flight recorders**
- . . flight load recorders
- measuring instruments
- . **flight recorders**
- . . flight load recorders
- recording instruments
- . **flight recorders**
- . . flight load recorders

### flight rules

- GS rules
  - . **flight rules**
  - . . instrument flight rules
  - . . visual flight rules
- RT air navigation
  - air traffic control
  - collision avoidance
  - National Airspace Utilization System
  - National Aviation System
  - noise reduction

### flight safety

- GS safety
  - . **flight safety**
- RT aerospace safety
  - air piracy
  - air traffic control
  - aircraft accidents
  - aircraft approach spacing
  - aircraft hazards
  - aircraft icing
  - aircraft safety
  - aircraft spin
  - all-weather landing systems
  - aviation meteorology
  - collision avoidance
  - crashes
  - crashworthiness
  - destruction
  - emergency landing
- ∞ flight
- ∞ flight stress
  - flying ejection seats
  - midair collisions
  - onboard equipment
  - runway incursions
  - safety devices
  - self sealing
  - terrorism
  - visual flight

### flight simulation

- GS simulation
  - . **flight simulation**
  - . . in-flight simulation
- RT acoustic simulation
  - altitude simulation
  - analog simulation
  - computerized simulation
  - control simulation
  - environment simulation
  - landing simulation
  - motion simulation
  - scene generation
  - space environment simulation
  - space flight
  - systems simulation
  - training simulators
  - virtual reality
  - weightlessness simulation

### flight simulators

DEF Training devices or apparatus that simulate certain conditions of flight or of flight operations.

- GS simulators
  - . training simulators
  - . . **flight simulators**
  - . . . cockpit simulators
  - training devices
  - . training simulators
  - . . **flight simulators**
  - . . . cockpit simulators
- RT atmospheric entry simulation
  - centrifuges
  - control simulation
  - cryogenic wind tunnels
  - in-flight simulation
  - Langley complex coordinator
  - lunar orbit and landing simulators

- ∞ missile simulators
- motion simulation
- motion simulators
- pilot training
- space environment simulation
- space simulators
- test facilities
- training devices
- wind tunnels

### flight stability tests

- GS flight tests
  - . **flight stability tests**
  - stability tests
  - . **flight stability tests**
- RT aerodynamic stability
- ∞ tests

### ∞ flight stress

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT flight fatigue
  - flight fitness
  - flight safety
  - human factors engineering
  - space flight stress
  - stress analysis
  - stresses

### flight stress (biology)

- SN (EXCLUDES MECHANICAL STRESS AND AND STRAIN)
- GS stress (biology)
  - . **flight stress (biology)**
  - . . space flight stress
- RT acceleration (physics)
  - biological effects
- ∞ biology
  - flight fatigue
  - jet lag
  - physiological factors
  - psychological factors
  - stress (physiology)
  - stress (psychology)
  - weightlessness

### flight surgeons

- GS personnel
  - . medical personnel
  - . . surgeons
  - . . . **flight surgeons**

### flight technical error

USE **pilot error**

### flight termination systems

USE **abort apparatus**

### flight test instruments

- GS flight instruments
  - . **flight test instruments**
- RT aircraft instruments
  - rocket-borne instruments
  - spacecraft instruments

### flight test vehicles

DEF Test vehicles for the conduct of flight tests either to test its own capabilities or to carry equipment requiring flight tests.

- GS test vehicles
  - . **flight test vehicles**

- RT ∞ aircraft
  - launch vehicles
  - missiles
  - research aircraft
- ∞ spacecraft
- ∞ vehicles
  - X-36 aircraft

### flight tests

DEF Tests by means of actual or attempted flight to see how an aircraft, spacecraft, space-air vehicle, or missile flies. Tests of a component part of a flying vehicle, or of an object carried in such a vehicle, to determine its suitability or reliability in terms of its intended function by making it endure actual flight.

- GS **flight tests**
  - . flight stability tests
- RT air start

- aircraft design
- altitude tests
- certification
- DAST program
- downrange
- dynamic tests
- engine tests
- ∞ flight
  - flight envelopes
  - free flight test apparatus
  - full scale tests
  - ground tests
  - high altitude tests
  - highly maneuverable aircraft
  - in-flight monitoring
  - in-flight simulation
  - missile design
  - missile tests
  - postmission analysis (spacecraft)
  - space electric rocket tests
  - stability tests
- ∞ tests
  - vibration tests
  - wing flow method tests
- flight time**
  - DEF The time from the moment an aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the next point of landing.
  - GS time
    - . **flight time**
  - RT air traffic control
    - burning time
  - ∞ flight
    - testing time
    - trajectories
    - transit time
    - turnaround (STS)
    - windows (intervals)
- flight training**
  - GS education
    - . **flight training**
    - . . pilot training
    - . . space flight training
    - . . . astronaut training
  - RT ejection training
    - flying personnel
    - training simulators
- ∞ **flight vehicles**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
  - RT aircraft configurations
    - ground effect machines
    - hypersonic vehicles
    - lunar flying vehicles
    - missiles
    - reentry vehicles
    - research vehicles
    - rocket vehicles
  - ∞ vehicles
- flint**
  - GS chalcogenides
    - . oxides
    - . . dioxides
    - . . . **flint**
  - silicon compounds
    - . **flint**
  - RT quartz
- flip-flops**
  - DEF Devices having two stable states and two input terminals (or types of input signals) each of which corresponds with one of the two states. The circuits remain in either state until caused to change to the other state by application of the corresponding signal. Similar bistable devices with an input which allows it to act as a single-stage binary counter. Used for bistable amplifiers.
  - UF *bistable amplifiers*
  - GS circuits
    - . bistable circuits
    - . . **flip-flops**
    - . . multivibrators
    - . . **flip-flops**
- RT computer storage devices
  - data storage
  - fluid switching elements
  - fluidic circuits
  - oscillators
- FLIR detectors**
  - DEF Forward-looking infrared detectors for sensing all emissions of heat or light. Used for forward looking infrared detectors.
  - UF *forward looking infrared detectors*
  - GS measuring instruments
    - . radiation measuring instruments
    - . . actinometers
    - . . . radiometers
    - . . . . infrared detectors
    - . . . . . **FLIR detectors**
    - . . infrared instruments
    - . . . infrared detectors
    - . . . . **FLIR detectors**
  - RT ∞ detectors
    - infrared radar
  - ∞ sensors
- float zones**
  - RT crystal growth
    - melts (crystal growth)
    - silicon
    - solar cells
    - space processing
    - zone melting
- floating**
  - RT ballast (mass)
    - buoyancy
    - floats
- floating point arithmetic**
  - GS number theory
    - . arithmetic
    - . . **floating point arithmetic**
  - RT computer programs
    - computers
    - data processing
- floats**
  - UF *flotation systems*
  - RT ballast (mass)
    - buoys
    - emergency life sustaining systems
    - floating
    - inflatable structures
    - landing gear
    - life rafts
    - rafts
    - separators
- flocculating**
  - RT agglomeration
    - coagulation
    - coalescing
    - colloiding
    - concentrating
    - flotation
    - micelles
    - precipitation (chemistry)
    - settling
    - water treatment
- flood control**
  - DEF The prevention or reduction of damage caused by flooding, as by containing water in reservoirs removed from areas where it would do damage, improving channel capacity to convey water past or through critical areas with the least amount of damage, and diverting excess water into bypasses or floodways.
  - RT canals
    - ∞ control
    - dams
    - drainage
    - hydrology
    - rainstorms
    - storm damage
    - storms (meteorology)
    - watersheds
- flood damage**
  - GS damage
    - . **flood damage**
- RT drainage patterns
  - hydrology
  - landslides
  - precipitation (meteorology)
  - seepage
  - storms
  - storms (meteorology)
  - tides
  - water erosion
  - water flow
- flood plains**
  - DEF The surfaces or strips of relatively smooth land adjacent to river channels, constructed by the present rivers in their existing regimens and covered with water when the rivers overflow.
  - GS land
    - . plains
    - . . **flood plains**
    - landforms
    - . plains
    - . . **flood plains**
  - RT floods
    - hydrogeology
    - hydrology
- flood predictions**
  - GS predictions
    - . **flood predictions**
  - RT floods
    - hydrogeology
    - hydrology
    - precipitation (meteorology)
    - rain
    - rainstorms
  - ∞ showers
    - storms (meteorology)
    - weather forecasting
- floods**
  - DEF Rising bodies of water (as in streams, lakes, seas, or behind dams) that overtop their natural or artificial confines and that cover land not normally underwater. Especially, any relatively high streamflows that overflow their banks in any reach of the stream, or that are measured by gage height of discharge quantity.
  - RT alluvium
    - drought
    - flood plains
    - flood predictions
    - hydrology
    - hydrology models
    - Mississippi River (US)
    - precipitation (meteorology)
    - storm damage
    - storms
    - storms (meteorology)
    - tides
    - water flow
    - water management
    - watersheds
- floors**
  - UF *decks (floors)*
  - RT basements
    - buildings
    - ceilings (architecture)
    - doors
  - ∞ platforms
    - substructures
    - tiles
    - walls
- Floquet theorem**
  - GS theorems
    - . **Floquet theorem**
  - RT differential equations
    - linear equations
    - periodic functions
- flora*
  - USE **plants (botany)**
- Florida**
  - GS nations
    - . United States
    - . . **Florida**
  - RT Everglades (FL)

## flotation

Gulf of Mexico  
Merritt Island (FL)

### flotation

RT activation  
beneficiation  
classifiers  
coagulation  
concentrating  
flocculating  
fluid rotor gyroscopes  
foaming  
levitation  
∞ separation  
settling  
size separation  
suspension systems (vehicles)  
water treatment

### flotation systems

USE **floats**

### ∞ flour

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT fines  
flour (food)

### flour (food)

RT ∞ flour  
∞ food  
millet  
powder (particles)

### ∞ flow

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF A stream or movement of air or other fluid, or the rate of fluid movement, in the open or in a duct, pipe, or passage; specifically, an airflow.

RT aerodynamics  
annular flow  
Brillouin flow  
cavity flow  
circulation  
corner flow  
creep properties  
cross flow  
exhaust nozzles  
flow equations  
flow velocity  
fluid flow  
grazing flow  
heat transmission  
information flow  
interactional aerodynamics  
inviscid flow  
low density flow  
mass flow  
orifice flow  
outlet flow  
panel method (fluid dynamics)  
plastic flow  
reacting flow  
shear flow  
solids flow  
steady flow  
transonic flow  
unsteady flow  
viscous flow

### flow chambers

RT ∞ chambers

### flow characteristics

GS dynamic characteristics  
. **flow characteristics**  
. . flow distribution  
. . flow stability  
. . . boundary layer stability  
. . . flame stability  
. . . magnetohydrodynamic stability  
. . . . Weibel instability  
. . . . Goertler instability  
. . . Taylor instability  
. . flow velocity  
. . . solar wind velocity  
RT barotropic flow

∞ characteristics  
critical flow  
cross flow  
eddy viscosity  
inviscid flow  
laminar flow  
nonuniform flow  
outlet flow  
reattached flow  
separated flow  
steady flow  
Strouhal number  
subcritical flow  
supercritical flow  
turbulence  
turbulent flow  
viscosity  
viscous flow

### flow charts

DEF Graphical representations of sequences of operations using symbols to represent the operations. Flow charts are more detailed representations than diagrams.

GS charts

. **flow charts**

RT block diagrams  
computer programming  
data flow analysis  
∞ flow graphs  
mathematical models

### flow coefficients

GS coefficients  
. **flow coefficients**  
. . discharge coefficient  
RT aerodynamic coefficients  
attenuation coefficients  
mass flow factors  
nozzle thrust coefficients  
reflectance  
transport properties

### flow deflection

RT computational fluid dynamics  
deflectors  
flow distribution  
flow velocity  
Prandtl-Meyer expansion

### flow direction indicators

GS display devices  
. **flow direction indicators**  
. . wind vanes  
measuring instruments  
. indicating instruments  
. . **flow direction indicators**  
. . . wind vanes

### flow distortion

GS distortion  
. **flow distortion**  
RT aerodynamic coefficients  
fluid flow  
horseshoe vortices  
multiphase flow  
Orr-Sommerfeld equations  
oscillating flow  
small perturbation flow  
vortices  
wing tip vortices

### flow distribution

UF *flow fields*  
*flow patterns*  
GS distribution (property)  
. **flow distribution**  
dynamic characteristics  
. flow characteristics  
. . **flow distribution**  
RT boundary layer flow  
boundary layer separation  
boundary layer thickness  
cavitation flow  
Chapman-Enskog theory  
exhaust flow simulation  
field theory (physics)  
flow deflection  
∞ flow graphs  
hydrodynamic coefficients

isothermal flow  
method of characteristics  
numerical flow visualization  
particle image velocimetry  
reattached flow  
rheoelectrical simulation  
separated flow  
stagnation point  
Strouhal number  
three dimensional bodies  
trapped vortices  
velocity distribution  
vortex sheets  
water tunnel tests  
wind tunnel tests

### flow equations

GS **flow equations**

. boundary layer equations  
. . Blasius equation  
. Chaplygin equation  
. Navier-Stokes equation  
. Reynolds equation  
. Von Karman equation  
. vorticity equations  
. . Helmholtz vorticity equation  
. Burnett equations  
RT Baldwin-Lomax turbulence model  
Bernoulli theorem  
computational fluid dynamics  
convection-diffusion equation  
∞ equations  
∞ flow  
fluid flow  
k-epsilon turbulence model  
particle in cell technique  
Percus method  
Rayleigh equations  
Reynolds averaging  
space-time CE/SE method  
turbulence models

### flow fields

USE **flow distribution**

### flow geometry

GS geometry  
. **flow geometry**  
RT annular flow  
axial flow  
axisymmetric flow  
backward facing steps  
bypass ratio  
channel flow  
coaxial flow  
core flow  
cross flow  
ducted flow  
helical flow  
horseshoe vortices  
inlet airframe configurations  
inlet flow  
laminar flow  
meridional flow  
nozzle flow  
one dimensional flow  
parallel flow  
radial flow  
steady flow  
stratified flow  
three dimensional flow  
two dimensional flow  
wedge flow

### ∞ flow graphs

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT equipotentials  
flow charts  
flow distribution  
signal flow graphs

### flow measurement

GS mechanical measurement  
. **flow measurement**  
. . particle image velocimetry  
RT anemometers  
annuli  
drag force anemometers

drag measurement  
 flowmeters  
 fluid flow  
 gas meters  
 hot-film anemometers  
 hot-wire anemometers  
 laser doppler velocimeters  
 ∞ measurement  
 multiphase flow  
 nonintrusive measurement  
 ∞ nozzles  
 orifices  
 pitot tubes  
 pneumatic probes  
 pressure measurement  
 pressure sensitive paints  
 rheology  
 solids flow  
 velocity measurement  
 Venturi tubes  
 water flow  
 wind velocity

**flow nets**

RT equipotentials  
 seepage

**flow noise**

(added March 2000)

DEF Noise produced by the flow of fluids around or through a body; the pressure variations associated with a turbulent flow field.

GS elastic waves  
 . sound waves  
 . . noise (sound)  
 . . . **flow noise**  
 . . . . aerodynamic noise  
 . . . . . blade slap noise  
 . . . . . propeller noise  
 . . . . . screech tones

RT aeroacoustics  
 ducted flow  
 Fflowcs Williams-Hawkings equation  
 nozzle flow  
 pipe flow  
 underwater acoustics

*flow patterns*

USE **flow distribution**

*flow rate*

USE **flow velocity**

**flow regulators**

GS control equipment  
 . regulators  
 . . **flow regulators**  
 . . . fuel flow regulators  
 RT flowmeters  
 oxygen regulators  
 pressure regulators

**flow resistance**

GS friction  
 . **flow resistance**  
 . . friction drag  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . viscous drag  
 RT eddy viscosity  
 ∞ high resistance  
 ∞ low resistance  
 ∞ resistance  
 skin friction  
 viscosity

*flow separation*

USE **boundary layer separation**  
**separated flow**

**flow stability**

UF *hydrodynamic stability*  
 GS dynamic characteristics  
 . dynamic stability  
 . . motion stability  
 . . . **flow stability**  
 . . . . boundary layer stability  
 . . . . . flame stability  
 . . . . . magnetohydrodynamic stability  
 . . . . . Weibel instability

. . . . Goertler instability  
 . . . . Taylor instability  
 . flow characteristics  
 . . **flow stability**  
 . . . boundary layer stability  
 . . . flame stability  
 . . . magnetohydrodynamic stability  
 . . . . Weibel instability  
 . . . Goertler instability  
 . . . Taylor instability  
 stability  
 . dynamic stability  
 . . motion stability  
 . . . **flow stability**  
 . . . . boundary layer stability  
 . . . . flame stability  
 . . . . magnetohydrodynamic stability  
 . . . . . Weibel instability  
 . . . . Goertler instability  
 . . . . Taylor instability

RT aerodynamic stability  
 baroclinic instability  
 directional stability  
 fluid flow  
 hydrodynamic equations  
 hydrofoil oscillations  
 Kelvin-Helmholtz instability  
 laminar flow  
 lateral stability  
 longitudinal stability  
 low speed stability  
 Orr-Sommerfeld equations  
 rotary stability  
 steady flow  
 Strouhal number  
 supersonic diffusers  
 systems stability  
 turbulent flow  
 unsteady flow  
 viscous fluids  
 Von Karman equation  
 vortex breakdown  
 vortex filaments  
 vortices  
 vorticity

**flow theory**

GS **flow theory**  
 . mixing length flow theory  
 RT aerodynamics  
 boundary layer equations  
 continuum mechanics  
 convection-diffusion equation  
 dislocations (materials)  
 fluid flow  
 fluid mechanics  
 hydrodynamic equations  
 hydrodynamics  
 Lighthill method  
 mass flow  
 Navier-Stokes equation  
 Orr-Sommerfeld equations  
 panel method (fluid dynamics)  
 pneumatics  
 rheology  
 solids flow  
 ∞ theories

**flow velocity**

DEF The volume per time unit given to the flow of gasses or other fluid substances which emerge from an orifice, pump, turbine, or passes along a conduit or channel. Used for flow rate.  
 UF *flow rate*  
 GS dynamic characteristics  
 . flow characteristics  
 . . **flow velocity**  
 . . . solar wind velocity  
 rates (per time)  
 . **flow velocity**  
 . . solar wind velocity  
 velocity  
 . **flow velocity**  
 . . solar wind velocity  
 RT Biot-Savart law  
 choked flow  
 discharge coefficient  
 dump combustors

exhaust velocity  
 ∞ flow  
 flow deflection  
 hydrodynamic coefficients  
 hypersonic flow  
 hypervelocity flow  
 laser anemometers  
 low speed  
 mass flow rate  
 parallel flow  
 particle image velocimetry  
 subsonic flow  
 supersonic flow  
 transonic flow  
 unsteady flow  
 velocity distribution  
 velocity measurement  
 vortex lattice method  
 vortex precession

**flow visualization**

UF *visualization of flow*  
 GS **flow visualization**  
 . numerical flow visualization  
 RT differential interferometry  
 fluid flow  
 hydraulic analogies  
 particle image velocimetry  
 pressure sensitive paints  
 Schlieren photography  
 shadowgraph photography  
 water tunnel tests  
 wind tunnel models

**flowmeters**

GS measuring instruments  
 . **flowmeters**  
 . . gas meters  
 . . hot-wire flowmeters  
 . . rheometers  
 RT electrical measurement  
 flow measurement  
 flow regulators  
 fluid flow  
 fuel gages  
 hot-wire anemometers  
 mechanical measurement  
 orifices  
 pitot tubes  
 pressure gages  
 pressure measurement  
 sonic anemometers  
 speed indicators  
 turbine instruments  
 velocity measurement  
 Venturi tubes  
 vortex precession

**FLOX**

UF *fluorine-liquid oxygen*  
 GS liquids  
 . cryogenic fluids  
 . . **FLOX**  
 oxidizers  
 . rocket oxidizers  
 . . **FLOX**  
 RT fluorine  
 liquid oxygen

*Fllsatcom*

USE **Fleet Satellite Communication System**

*fluctuation*

USE **variations**

**fluctuation theory**

RT homogeneous turbulence  
 squeezed states (quantum theory)  
 statistical mechanics  
 ∞ theories

**flue gases**

DEF Gaseous combustion products from a furnace.  
 GS gases  
 . exhaust gases  
 . . **flue gases**  
 RT air pollution  
 combustion products

# fluence

- desulfurizing
- electric power plants
- flues
- pollution control
- scrubbers
- fluence**
- RT health physics
- ionizing radiation
- radiation counters
- fluierics**
- GS fluidics
- . **fluierics**
- RT fluid amplifiers
- fluid switching elements
- fluidic circuits
- hydraulic analogies
- flues**
- RT chimneys
- draft (gas flow)
- ducts
- exhaust systems
- flue gases
- vents
- fluid amplification*
- USE **fluid amplifiers**
- fluid amplifiers**
- UF *fluid amplification*
- fluid jet amplifiers*
- GS amplifiers
- . **fluid amplifiers**
- . . jet amplifiers
- RT amplification
- automatic control valves
- boundary layer control
- Coanda effect
- convergent nozzles
- fluierics
- fluidic circuits
- fluidics
- hydraulic equipment
- pneumatic equipment
- pressure recovery
- turbulent flow
- turbulent jets
- wall jets
- fluid boundaries**
- GS boundaries
- . **fluid boundaries**
- . . gas-solid interfaces
- . . jet boundaries
- . . liquid-liquid interfaces
- . . liquid-solid interfaces
- . . liquid-vapor interfaces
- interfaces
- . **fluid boundaries**
- . . gas-solid interfaces
- . . jet boundaries
- . . liquid-liquid interfaces
- . . liquid-solid interfaces
- . . liquid-vapor interfaces
- RT backward facing steps
- boundary layers
- cavity flow
- free boundaries
- heat transfer
- interface stability
- liquid levels
- liquid surfaces
- pressure gradients
- fluid dynamics**
- UF *cascades (fluid dynamics)*
- GS mechanics (physics)
- . fluid mechanics
- . . **fluid dynamics**
- . . . computational fluid dynamics
- . . . gas dynamics
- . . . aerodynamics
- . . . . aerothermodynamics
- . . . . hypersonics
- . . . . rotor aerodynamics
- . . . . supersonics
- . . . . unsteady aerodynamics
- . . . . interactional aerodynamics
- . . . . rarefied gas dynamics
- . . . hydrodynamics
- . . . . elastrohydrodynamics
- . . . . electrohydrodynamics
- . . . . magnetohydrodynamics
- . . . . rotons
- . . . vortex shedding
- RT continuity equation
- convection
- ∞ dynamics
- Eyring theory
- fluid management
- flux vector splitting
- gas-solid interactions
- geophysical fluids
- Glimm method
- ∞ hydraulics
- hydromechanics
- kinetics
- Magnus effect
- ocean dynamics
- panel method (fluid dynamics)
- piston theory
- primitive equations
- quasi-steady states
- ∞ science
- slamming
- stagnation point
- steady state
- streamlining
- thermohydraulics
- turbulence
- unsteady state
- vortex filaments
- fluid filled shells**
- DEF Shells of revolution containing a gas or liquid.
- GS shells (structural forms)
- . **fluid filled shells**
- . . liquid filled shells
- RT hydrodynamic ram effect
- propellant tanks
- reinforced shells
- shell stability
- ∞ storage
- tanks (containers)
- ∞ vessels
- fluid films**
- GS **fluid films**
- . squeeze films
- RT ∞ films
- gas bearings
- liquid-solid interfaces
- fluid filters**
- UF *mass filters*
- particulate filters*
- GS separators
- . **fluid filters**
- . . air filters
- RT centrifuges
- concentrators
- ∞ filters
- filtration
- fluidized bed processors
- sieves
- sizing screens
- fluid flow**
- UF *induced fluid flow*
- rotational flow*
- GS **fluid flow**
- . adiabatic flow
- . axial flow
- . axisymmetric flow
- . . annular flow
- . . Karman-Bodewadt flow
- . barotropic flow
- . base flow
- . Beltrami flow
- . blood flow
- . capillary flow
- . cascade flow
- . choked flow
- . coaxial flow
- . compressible flow
- . . Ringleb flow
- . . transonic flow
- . conical flow
- . convective flow
- . . Rayleigh-Benard convection
- . . Benard cells
- . . buoyancy-driven flow
- . core flow
- . corner flow
- . counterflow
- . critical flow
- . cross flow
- . free flow
- . fuel flow
- . . propellant transfer
- . gas flow
- . . air flow
- . . . air currents
- . . . . jet streams (meteorology)
- . . . . meridional flow
- . . . . vertical air currents
- . . continuum flow
- . . cooling flows (astrophysics)
- . . equilibrium flow
- . . frozen equilibrium flow
- . . . shifting equilibrium flow
- . . free molecular flow
- . . Knudsen flow
- . . molecular flow
- . . . slip flow
- . . . transition flow
- . . nonequilibrium flow
- . . pipe flow
- . . head (fluid mechanics)
- . . head flow
- . . pressure heads
- . . helical flow
- . . hypersonic flow
- . . hypervelocity flow
- . . incompressible flow
- . . Stokes flow
- . . internal flow
- . . cavity flow
- . . channel flow
- . . . open channel flow
- . . ducted flow
- . . . Knudsen flow
- . . inlet flow
- . . nozzle flow
- . . pipe flow
- . . inviscid flow
- . . stagnation flow
- . . isothermal flow
- . . jet flow
- . . air jets
- . . jet mixing flow
- . . peripheral jet flow
- . . supersonic jet flow
- . . laminar flow
- . . Blasius flow
- . . Hartmann flow
- . . stratified flow
- . . liquid flow
- . . open channel flow
- . . water flow
- . . low density flow
- . . magnetohydrodynamic flow
- . . mass flow
- . . multiphase flow
- . . two phase flow
- . . nonNewtonian flow
- . . nonuniform flow
- . . one dimensional flow
- . . orifice flow
- . . outlet flow
- . . parallel flow
- . . wedge flow
- . . pipe flow
- . . three dimensional flow
- . . . Karman-Bodewadt flow
- . . . secondary flow
- . . plastic flow
- . . Tresca flow
- . . potential flow
- . . equipotentials
- . . radial flow
- . . reacting flow
- . . combustable flow
- . . recirculative fluid flow
- . . reversed flow
- . . shear flow

- . single-phase flow
- . small perturbation flow
- . solids flow
- . steady flow
- .. Couette flow
- .. Hartmann flow
- .. Ringleb flow
- . steam flow
- . subcritical flow
- . subsonic flow
- . supercritical flow
- . supersonic flow
- .. supersonic jet flow
- . turbulent flow
- .. cavitation flow
- .. supercavitating flow
- . two dimensional flow
- .. Couette flow
- .. Ringleb flow
- . uniform flow
- .. Blasius flow
- . unsteady flow
- .. oscillating flow
- . viscous flow
- .. boundary layer flow
- .. . reattached flow
- .. . secondary flow
- .. . separated flow
- .. . boundary layer separation
- .. Couette flow
- .. Karman-Bodewadt flow
- .. Stokes flow
- . wall flow
- RT acoustic streaming
- annular ducts
- Bernoulli theorem
- boundary layers
- canals
- Cartan space
- chemical engineering
- circulation
- coaxial nozzles
- ∞ conductivity
- convection currents
- ∞ currents
- dimensional analysis
- dimensionless numbers
- drag reduction
- duct geometry
- expulsion
- ∞ flow
- flow distortion
- flow equations
- flow measurement
- flow stability
- flow theory
- flow visualization
- flowmeters
- fluidics
- ∞ fluids
- friction
- Froude number
- geophysical fluid flow cells
- heat transmission
- ∞ hydraulics
- hydrodynamics
- hydromechanics
- injection
- labyrinth seals
- leakage
- Lewis numbers
- Magnus effect
- Manning theory
- materials handling
- mechanical engineering
- ocean currents
- ocean surface
- pipes (tubes)
- planetary waves
- pressure gradients
- Rayleigh waves
- Reynolds number
- skin friction
- solar convection (astronomy)
- stellar convection
- streams
- supersonic boundary layers
- surges
- syringes

- thermohydraulics
- ultrasonic cleaning
- vortices
- wing flow method tests
- fluid injection**
- GS injection
- . **fluid injection**
- .. gas injection
- .. liquid injection
- .. . deep well injection (wastes)
- .. . water injection
- RT channel flow
- fuel injection
- inlet flow
- laminar mixing
- nozzle flow
- secondary injection

*fluid jet amplifiers*  
 USE **fluid amplifiers**  
**jet amplifiers**

**fluid jets**

- GS **fluid jets**
- . air jets
- . free jets
- . gas jets
- . hydraulic jets
- . vapor jets
- RT jet amplifiers
- jet flow
- jet mixing flow
- jet streams (meteorology)
- ∞ jets
- plasma jets

**fluid logic**

- RT computer design
- fluidic circuits
- fluidics
- ∞ logic
- logic circuits

**fluid management**

DEF The isolation and separation of liquids from gas in a storage vessel which operates in a reduced or zero gravity environment using liquid acquisition devices such as those used in the Space Shuttle RCS tankage.

- RT cryogenic fluid storage
- cryogenic fluids
- cryogenic rocket propellants
- fluid dynamics
- fuel control
- microgravity

**fluid mechanics**

DEF The experimental and mathematical study of the mechanical properties of gases and liquids at rest and in motion.

- GS mechanics (physics)
- . **fluid mechanics**
- .. fluid dynamics
- .. . computational fluid dynamics
- .. . gas dynamics
- .. . . aerodynamics
- .. . . . aerothermodynamics
- .. . . . hypersonics
- .. . . . rotor aerodynamics
- .. . . . supersonics
- .. . . . unsteady aerodynamics
- .. . . . interactional aerodynamics
- .. . . . rarefied gas dynamics
- .. . . . hydrodynamics
- .. . . . elasto-hydrodynamics
- .. . . . electrohydrodynamics
- .. . . . magnetohydrodynamics
- .. . . . rotors
- .. . . . vortex shedding
- .. . . . hydromechanics
- .. . . . hydrodynamics
- .. . . . elasto-hydrodynamics
- .. . . . electrohydrodynamics
- .. . . . magnetohydrodynamics
- .. . . . hydrostatics
- .. . . . magnetohydrostatics
- .. . . . pneumatics
- RT aerostatics
- ∞ bleeding

- continuum mechanics
- diffusivity
- ∞ dynamics
- flat plates
- flow theory
- fluidics
- ∞ hydraulics
- hydrodynamic equations
- incompressibility
- kinetics
- Maxwell fluids
- micropolar fluids
- ∞ science
- statics
- supercritical fluids
- thermodynamics

**fluid power**

- RT compressible fluids
- fluid pressure
- fluidic circuits
- fluidics
- hydraulic control
- hydraulic equipment
- ∞ hydraulics
- hydrodynamics
- incompressible fluids
- pneumatic control
- pneumatic equipment
- pneumatics
- ∞ power
- ∞ pressure drop
- working fluids

**fluid pressure**

- GS pressure
- . **fluid pressure**
- .. water pressure
- RT beta factor
- fluid power
- fluidics
- ∞ fluids
- hydraulic fluids

**fluid rotor gyroscopes**

- GS gyroscopes
- . rotary gyroscopes
- .. **fluid rotor gyroscopes**
- RT flotation
- gimbals

**fluid shifts (biology)**  
*(added August 2004)*

DEF Translocation of body fluids from one compartment to another, such as from the vascular to the interstitial compartments. Fluid shifts are associated with profound changes in vascular permeability and water-electrolyte imbalance. The shift can also be from the lower body to the upper body as in conditions of weightlessness.

- GS biological effects
- . **fluid shifts (biology)**
- RT aerospace medicine
- body fluids
- gravitational physiology
- lower body negative pressure
- orthostatic tolerance
- physiological effects

**fluid switching elements**

- GS circuits
- . switching circuits
- .. **fluid switching elements**
- switches
- . switching circuits
- .. **fluid switching elements**
- RT acoustic streaming
- automatic control valves
- flip-flops
- flueries
- fluidic circuits
- fluidics
- hydraulic equipment
- pneumatic equipment

**fluid transmission lines**

- GS transmission lines
- . **fluid transmission lines**
- RT hydraulic fluids



## fluidic circuits

transmission fluids  
working fluids

*fluid transpiration*

USE **transpiration**

### fluidic circuits

GS circuits  
. **fluidic circuits**  
RT flip-flops  
fluorics  
fluid amplifiers  
fluid logic  
fluid power  
fluid switching elements  
fluidics  
fly by tube control  
microfluidic devices

### fluidics

GS **fluidics**  
. fluorics  
RT amplification  
∞ control  
fluid amplifiers  
fluid flow  
fluid logic  
fluid mechanics  
fluid power  
fluid pressure  
fluid switching elements  
fluidic circuits  
hydraulic analogies  
hydraulic control  
internal flow  
∞ logic  
microfluidic devices  
pneumatic circuits  
pneumatic control  
pneumatic equipment  
pneumatics

### fluidized bed processors

RT beds (process engineering)  
chemical reactors  
fluid filters  
furnaces  
separators

### ∞ fluids

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT anisotropic fluids  
binary fluids  
body fluids  
cerebrospinal fluid  
compressible fluids  
conducting fluids  
cryogenic fluids  
ferrofluids  
fluid flow  
fluid pressure  
gases  
gyroscope fluids  
high temperature fluids  
hydraulic fluids  
ideal fluids  
incompressible fluids  
liquids  
magnetorheological fluids  
Maxwell fluids  
micropolar fluids  
Newtonian fluids  
nonequilibrium flow  
nonNewtonian fluids  
rheology  
rotating fluids  
serums  
siphoning  
solids  
supercritical fluids  
superfluidity  
transmission fluids  
viscous fluids  
weightless fluids  
working fluids

### fluid-solid interactions

DEF The interactions of a rigid or elastic structure with an incompressible or compress-

ible fluid. Airblast loading and response, acoustic interaction, aeroelasticity, and hydroelasticity comprise its major divisions.

### GS fluid-solid interactions

. gas-solid interactions  
. . gas-metal interactions  
RT gas-solid interfaces  
∞ interactions  
liquid-solid interfaces  
surface reactions

### fluorescence

DEF Emission of light or other radiant energy as a result of and only during absorption of radiation of a different wavelength from some other source. Used for fluorescent emission.

UF *fluorescent emission*

GS emission  
. light emission  
. luminescence  
. . . **fluorescence**  
. . . . laser induced fluorescence  
. . . . phosphorescence  
. . . . resonance fluorescence  
. . . . x ray fluorescence  
RT electromagnetic absorption  
extinction  
Mossbauer effect  
phosphors  
photoexcitation  
photoluminescence  
plasma radiation  
rhodamine  
temperature sensitive paints  
triboluminescence

*fluorescent emission*

USE **fluorescence**

### fluorides

GS halogen compounds  
. fluorine compounds  
. **fluorides**  
. . . antimony fluorides  
. . . barium fluorides  
. . . boron fluorides  
. . . chlorine fluorides  
. . . compound A  
. . . cryolite  
. . . deuterium fluorides  
. . . difluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . hydrofluoric acid  
. . . metal fluorides  
. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides  
. . . . protactinium fluorides  
. . . . sodium fluorides  
. . . . strontium fluorides  
. . . . thorium fluorides  
. . . . tungsten fluorides  
. . . . uranium fluorides  
. . . . zinc fluorides  
. . . . zirconium fluorides  
. . . nitrogen fluorides  
. . . nitril fluorides  
. . . oxyfluorides  
. . . oxygen fluorides  
. . . ozone fluoride  
. . . perchloryl fluorides  
. . . polyvinyl fluoride  
. . . sulfur fluorides  
. . . . sulfur hexafluoride  
. . . technetium fluorides  
. halides  
. **fluorides**  
. . . antimony fluorides

. . . barium fluorides  
. . . boron fluorides  
. . . chlorine fluorides  
. . . compound A  
. . . cryolite  
. . . deuterium fluorides  
. . . difluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . hydrofluoric acid  
. . . metal fluorides  
. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides  
. . . . protactinium fluorides  
. . . . sodium fluorides  
. . . . strontium fluorides  
. . . . thorium fluorides  
. . . . tungsten fluorides  
. . . . uranium fluorides  
. . . . zinc fluorides  
. . . . zirconium fluorides  
. . . nitrogen fluorides  
. . . nitril fluorides  
. . . oxyfluorides  
. . . oxygen fluorides  
. . . ozone fluoride  
. . . perchloryl fluorides  
. . . polyvinyl fluoride  
. . . sulfur fluorides  
. . . . sulfur hexafluoride  
. . . technetium fluorides  
RT excimer lasers

### fluorination

GS chemical reactions  
. halogenation  
. **fluorination**  
RT defluorination

### fluorine

GS chemical elements  
. halogens  
. **fluorine**  
. . . fluorine isotopes  
. . . liquid fluorine  
RT FLOX  
oxidizers

### fluorine compounds

GS halogen compounds  
. **fluorine compounds**  
. . fluorides  
. . . antimony fluorides  
. . . barium fluorides  
. . . boron fluorides  
. . . chlorine fluorides  
. . . compound A  
. . . cryolite  
. . . deuterium fluorides  
. . . difluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . hydrofluoric acid  
. . . metal fluorides  
. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides

- ... protactinium fluorides
  - ... sodium fluorides
  - ... strontium fluorides
  - ... thorium fluorides
  - ... tungsten fluorides
  - ... uranium fluorides
  - ... zinc fluorides
  - ... zirconium fluorides
  - ... nitrogen fluorides
  - ... nitril fluorides
  - ... oxyfluorides
  - ... oxygen fluorides
  - ... ozone fluoride
  - ... perchloryl fluorides
  - ... polyvinyl fluoride
  - ... sulfur fluorides
  - ... sulfur hexafluoride
  - ... technetium fluorides
  - ... fluorite
  - ... fluoro compounds
  - ... cryolite
  - ... difluoro compounds
  - ... perfluoroalkane
  - ... polytetrafluoroethylene
  - ... teflon (trademark)
  - ... fluorine organic compounds
  - ... fluoroamines
  - ... nitrofluoroamines
  - ... trifluoroamine oxide
  - ... fluorocarbons
  - ... fluorohydrocarbons
  - ... carbon tetrafluoride
  - ... chlorofluoromethane
  - ... polytetrafluoroethylene
  - ... teflon (trademark)
  - ... fluoropolymers
  - ... polytetrafluoroethylene
  - ... teflon (trademark)
  - ... KEL-F
  - ... polyvinyl fluoride
  - ... perfluoroalkane
  - ... perfluoroguanidine
  - ... fluorosilicates
  - ... tetrafluorohydrazine
  - RT  $\infty$  chemical compounds
  - halocarbons
- fluorine isotopes**
- GS chemical elements
  - halogens
  - fluorine
  - fluorine isotopes
  - nuclides
  - isotopes
  - fluorine isotopes
- fluorine organic compounds**
- UF *organic fluorine compounds*
  - GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorine organic compounds
  - fluoroamines
  - nitrofluoroamines
  - trifluoroamine oxide
  - fluorocarbons
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
  - fluoropolymers
  - polytetrafluoroethylene
  - teflon (trademark)
  - KEL-F
  - polyvinyl fluoride
  - perfluoroalkane
  - perfluoroguanidine
  - organic compounds
  - fluorine organic compounds
  - fluoroamines
  - nitrofluoroamines
  - trifluoroamine oxide
  - fluorocarbons
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
- fluoropolymers**
- DEF A family of polymers based on fluorine replacement of hydrogen atoms in hydrocarbon molecules. Compounds are characterized by chemical inertness, thermal stability, and low coefficient of friction. Used for fluoroplastics.
  - UF *fluoroplastics*
  - GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorine organic compounds
  - fluoropolymers
  - polytetrafluoroethylene
  - teflon (trademark)
  - KEL-F
  - polyvinyl fluoride
  - organic compounds
  - fluorine organic compounds
  - fluoropolymers
  - polytetrafluoroethylene
  - teflon (trademark)
  - KEL-F
  - polyvinyl fluoride
  - RT fluorocarbons
  - plastics
  - $\infty$  polymers
- fluoroscopy**
- RT medical equipment
  - x ray analysis
- fluorosilicates**
- UF *fluoromica*
  - GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorosilicates
  - silicon compounds
  - silicates
  - fluorosilicates
  - RT minerals
- fluorspar**
- GS calcium compounds
  - calcium fluorides
  - fluorspar
  - halogen compounds
  - fluorine compounds
- ... fluoropolymers
  - ... polytetrafluoroethylene
  - ... teflon (trademark)
  - ... KEL-F
  - ... polyvinyl fluoride
  - ... perfluoroalkane
  - ... perfluoroguanidine
  - RT  $\infty$  chemical compounds
- fluorine-liquid oxygen*
- USE **FLOX**
- fluorite**
- GS calcium compounds
  - fluorite
  - halogen compounds
  - fluorine compounds
  - fluorite
  - minerals
  - fluorite
- fluoro compounds**
- GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - cryolite
  - difluoro compounds
  - perfluoroalkane
  - polytetrafluoroethylene
  - teflon (trademark)
  - fluorine organic compounds
  - fluoroamines
  - trifluoroamine oxide
  - fluorocarbons
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
  - fluoropolymers
  - polytetrafluoroethylene
  - teflon (trademark)
  - KEL-F
  - polyvinyl fluoride
  - perfluoroalkane
  - perfluoroguanidine
  - fluorosilicates
  - tetrafluorohydrazine
  - RT  $\infty$  chemical compounds
  - halocarbons
- fluoroamines**
- GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorine organic compounds
  - fluoroamines
  - nitrofluoroamines
  - trifluoroamine oxide
  - organic compounds
  - amines
  - fluoroamines
  - nitrofluoroamines
  - trifluoroamine oxide
  - fluorine organic compounds
  - fluoroamines
  - nitrofluoroamines
  - trifluoroamine oxide
- fluorocarbons**
- DEF All compounds containing fluorine and carbon (including other elements).
  - GS carbon compounds
  - halocarbons
  - fluorocarbons
  - halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorine organic compounds
  - fluorocarbons
  - halocarbons
  - fluorocarbons
  - organic compounds
  - fluorine organic compounds
  - fluorocarbons
  - chlorofluorocarbons
  - fluorohydrocarbons
  - fluoropolymers
  - RT chlorofluorocarbons
  - fluorohydrocarbons
  - fluoropolymers
- halon
- fluorohydrocarbons**
- GS halogen compounds
  - fluorine compounds
  - fluoro compounds
  - fluorine organic compounds
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
  - organic compounds
  - fluorine organic compounds
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
  - hydrocarbons
  - fluorohydrocarbons
  - carbon tetrafluoride
  - chlorofluoromethane
  - polytetrafluoroethylene
  - teflon (trademark)
  - RT fluorocarbons
  - freon
  - refrigerants
  - Viton rubber (trademark)
- fluoromica*
- USE **fluorosilicates**
- mica**
- fluorophlogopite**
- GS minerals
  - mica
  - fluorophlogopite
- fluoroplastics*
- USE **fluoropolymers**

## flushing

- . . . fluorides
- . . . . difluorides
- . . . . . calcium fluorides
- . . . . . **fluorspar**
- . . . . . metal fluorides
- . . . . . calcium fluorides
- . . . . . **fluorspar**
- . . . halides
- . . . fluorides
- . . . . difluorides
- . . . . . calcium fluorides
- . . . . . **fluorspar**
- . . . . . metal fluorides
- . . . . . calcium fluorides
- . . . . . **fluorspar**
- . . . metal halides
- . . . . metal fluorides
- . . . . . calcium fluorides
- . . . . . **fluorspar**
- minerals
- . **fluorspar**

## flushing

RT cleaning  
ejection  
elution  
expellants  
leaching  
purging  
purification  
∞ separation  
venting  
washing  
waste water

## fluting

USE **grooving**

## flutter

DEF An aeroelastic self excited vibration in which the external source of energy is the airstream and which depends on the elastic, inertial and dissipative forces of the system in addition to the aerodynamic forces. Used for aerodynamic buzz and aeromagneto flutter.

UF *aerodynamic buzz*  
*aeromagneto flutter*

GS vibration  
. structural vibration

- . . **flutter**
- . . . panel flutter
- . . . subsonic flutter
- . . . supersonic flutter
- . . . transonic flutter

RT aerodynamic noise  
aerodynamic stability  
aeroelastic research wings  
aeroelasticity  
aeroservoelasticity  
airfoil oscillations  
bending  
bending vibration  
boundary layer control  
buffeting  
compressibility effects  
DAST program  
flapping  
flight characteristics  
forced vibration  
hovering  
hydrofoil oscillations  
influence coefficient  
missile vibration  
random vibration  
resonant vibration  
self induced vibration  
shaking  
spacecraft motion  
turbulence effects  
undamped oscillations  
unsteady aerodynamics  
vibration simulators  
vibration tests  
vibrational stress  
wing oscillations

## flutter analysis

GS structural analysis  
. dynamic structural analysis  
. . **flutter analysis**

RT aeroelastic research wings  
airfoil oscillations  
structural vibration  
unsteady aerodynamics

## ∞ flux

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF The rate of flow of some quantity, often used in reference to the flow of some form of energy. In nuclear physics generally, the number of radioactive particles per unit volume times their mean velocity.

RT flux (rate)  
flux density  
flux difference splitting  
flux quantization  
fluxes  
level (quantity)

*flux (rate per unit area)*

USE **flux density**

## flux (rate)

SN (LIMITED TO THE TOTAL EMANATION OF ENERGY, MATERIAL OR PARTICLES FROM A SINGLE SOURCE PER UNIT TIME--SEE FLUX DENSITY FOR ENERGY, MATERIAL OR PARTICLE RATE PER UNIT AREA)

DEF The total emanation of energy, material or particles from a single source per unit time. Used for electron flux, neutron flux, and particle flux.

UF *electron flux*  
*neutron flux*

GS *particle flux*  
rates (per time)

- . **flux (rate)**
- . . heat flux
- . . magnetic flux
- . . solar flux

RT beta particles  
brightness  
corpuscular radiation  
dosimeters  
electromagnetic radiation  
emittance

∞ energy  
field theory (physics)

∞ flux

- flux density
- gamma rays

∞ intensity

- level (quantity)
- luminous intensity
- magnetic circuits
- magnetic induction
- magnetostatics
- particle beams
- particle diffusion

∞ power

- radiant flux density

∞ radiation

- Stefan-Boltzmann law

## flux density

SN (LIMITED TO ENERGY, MATERIAL OR PARTICLE RATE PER UNIT AREA, THE QUANTITY USUALLY MEASURED--SEE FLUX (RATE) FOR TOTAL EMANATION FROM A SINGLE SOURCE PER UNIT TIME)

DEF The flux (rate of flow) of any quantity, usually a form of energy, through a unit area of specified surface. (Note that this is not a volumetric density like radiant density.) Used for density (rate/area), energy density, flux (rate per unit area), and flux mapping.

UF *density (rate/area)*  
*energy density*  
*flux (rate per unit area)*  
*flux mapping*

GS rates (per time)

- . **flux density**
- . . current density
- . . photon density
- . . radiant flux density
- . . . irradiance
- . . . . illuminance
- . . . . solar constant
- . . . lumens

- . . . luminous intensity
- . . . . illuminance
- . . . . luminance
- . . . particle flux density
- . . . . electron flux density
- . . . . neutron flux density
- . . . . proton flux density
- . . . radiance
- . . . radiancy
- . . . solar flux density
- . . . solar constant
- . . sound intensity
- . . . zero sound

RT alpha particles  
angular distribution  
atom concentration  
∞ density  
dosimeters  
electromagnetic radiation  
∞ energy  
energy distribution  
field intensity meters  
field strength  
field theory (physics)

∞ flux

- flux (rate)
- gamma rays
- heat flux

∞ intensity

- irradiation
- level (quantity)
- loudness

- mass distribution
- meteoroid concentration
- Onsager phenomenological coefficient

∞ power

- power spectra
- protons

∞ radiation

- radiation distribution
- radiation hazards
- remanence
- scattering functions
- Solar Maximum Mission
- sound pressure
- spectra
- x ray density measurement

## flux difference splitting

(added May 1995)

UF *Roe flux difference splitting scheme*

GS analysis (mathematics)

- . numerical analysis
- . . **flux difference splitting**
- splitting

- . **flux difference splitting**

RT computational fluid dynamics  
finite difference theory

∞ flux

- flux vector splitting

## flux mapping

USE **flux density**  
**mapping**

## flux pinning

DEF In superconductors, the interaction between the magnetic and the metallurgical microstructures. It controls the critical current density in a given superconducting material.

GS pinning

- . **flux pinning**

RT lines of force  
magnetic flux  
superconductivity  
trapped magnetic fields  
trapping

## flux pumps

DEF Cryogenic DC generators.

RT magnetic coils  
magnetic fields  
superconducting magnets  
superconductivity

## flux quantization

RT ∞ flux

- magnetic flux

superconductors (materials)

### flux transfer events

(added July 1989)

GS magnetic properties  
 . magnetoactivity  
 . . flux transfer events  
 RT aeronomy  
 geomagnetism  
 interplanetary magnetic fields  
 lines of force  
 magnetic effects  
 magnetic field configurations  
 magnetic field reconnection  
 magnetic fields  
 magnetic flux  
 magnetopause  
 magnetosphere-ionosphere coupling  
 space plasmas

### flux vector splitting

DEF The splitting of the nonlinear flux vectors of the conservation law form of the inviscid gasdynamic equations into subvectors by similarity transformations so that each subvector has associated with it a specified eigenvalue spectrum.

GS analysis (mathematics)  
 . numerical analysis  
 . . flux vector splitting  
 splitting  
 . flux vector splitting

RT computation  
 computational fluid dynamics  
 eigenvalues  
 finite difference theory  
 fluid dynamics  
 flux difference splitting  
 panel method (fluid dynamics)  
 vector analysis  
 vectors (mathematics)  
 vortex lattice method

### fluxes

RT brazing  
 ∞ flux  
 limestone  
 soldering  
 welding

### fluxmeters

USE magnetic measurement  
 measuring instruments

### fly ash

DEF Fine particulate, essentially noncombustible refuse, carried in a gas stream from a furnace.

GS ashes  
 . fly ash  
 RT air pollution  
 coal  
 combustion products  
 electric power plants  
 electrostatic precipitators  
 particulates  
 pollution control

### fly by light control

(added December 1992)

UF FBL control  
 GS flight control  
 . fly by light control  
 RT aircraft control  
 fiber optics  
 optical fibers

### fly by tube control

DEF A fluidic flight control for aircraft in which a hydraulic control signal link connects the pilot's controls to the control surface actuators.

GS flight control  
 . fly by tube control  
 RT aircraft control  
 ∞ control  
 fluidic circuits  
 hydraulic equipment

servoamplifiers

### fly by wire control

UF electric aircraft  
 GS flight control  
 . fly by wire control  
 RT aircraft control  
 ∞ control  
 ground based control  
 spacecraft control

### flyby missions

DEF Interplanetary missions in which the vehicle passes close to the target planet but does not impact it or go into orbit around it.

GS space missions  
 . flyby missions  
 . . Giotto mission  
 . . Grand Tours  
 . . . Mariner Jupiter-Saturn flyby  
 . . . Mariner Jupiter-Uranus flyby  
 . . . Voyager 1977 mission  
 . . Comet Nucleus Tour  
 . . Comet Rendezvous Asteroid Flyby Mission  
 . . Deep Impact Mission  
 . . Mariner Venus-Mercury 1973  
 . . Mariner-Mercury 1973  
 . . Near Earth Asteroid Rendezvous Mission  
 . . New Horizons mission  
 . . Stardust Mission

RT asteroid missions  
 Clementine spacecraft  
 Deep Space 1 Mission  
 Galileo project  
 Galileo spacecraft  
 interplanetary flight  
 long duration space flight  
 lunar flight  
 Mariner Mark 2 Spacecraft  
 Mariner program  
 ∞ missions  
 outer planets explorers  
 space flight  
 swingby technique  
 TOPS (spacecraft)  
 Vega project  
 Voyager 1 spacecraft  
 Voyager 2 spacecraft

### flying

USE flight

### Flying Bedstead aircraft

USE flying platforms

### Flying Crane helicopter

USE H-17 helicopter

### flying ejection seats

GS onboard equipment  
 . aircraft equipment  
 . . ejection seats  
 . . . flying ejection seats  
 safety devices  
 . ejection seats  
 . . flying ejection seats  
 seats  
 . ejection seats  
 . . flying ejection seats  
 RT abort apparatus  
 aircraft safety  
 bailout  
 cockpits  
 ejectors  
 escape capsules  
 flight safety  
 jet engines  
 protection

### flying in formation

(added October 2001)

USE formation flying

### flying personnel

GS personnel  
 . flying personnel  
 . . astronauts  
 . . . orbital workers

. . cosmonauts  
 . . flight crews  
 . . . spacecrews  
 . . pilots (personnel)  
 . . . aircraft pilots  
 . . . . test pilots

RT flight fitness  
 flight training  
 navigators

### flying platform stability

USE aerodynamic stability  
 flying platforms

### flying platforms

UF Flying Bedstead aircraft  
 flying platform stability  
 GS V/STOL aircraft  
 . vertical takeoff aircraft  
 . . flying platforms  
 RT ∞ aircraft  
 ground effect machines  
 jet aircraft  
 observation aircraft  
 ∞ platforms  
 reconnaissance aircraft  
 research aircraft  
 ∞ subsonic aircraft  
 VZ-8 aircraft

### flying qualities

USE flight characteristics

### flying spot scanners

GS optical equipment  
 . optical scanners  
 . . flying spot scanners  
 scanners  
 . optical scanners  
 . . flying spot scanners  
 RT display devices  
 electron guns  
 electron optics  
 image tubes  
 oscilloscopes  
 phototubes  
 picture tubes  
 television equipment  
 video equipment

### flying wing aircraft

USE tailless aircraft

### flying wing configurations

(added April 2001)

USE blended-wing-body configurations

### flywheels

GS rotating bodies  
 . rotors  
 . . flywheels  
 wheels  
 . flywheels  
 RT balancing  
 counter-rotating wheels  
 energy storage  
 engine parts  
 mechanical engineering  
 reaction wheels

### FM (modulation)

USE frequency modulation

### FM/PM (modulation)

DEF Phase modulation of a carrier by sub-carrier(s) which is (are) frequency modulated by information.

GS coding  
 . signal encoding  
 . . frequency modulation  
 . . . FM/PM (modulation)  
 . . phase modulation  
 . . . FM/PM (modulation)  
 modulation  
 . frequency modulation  
 . . FM/PM (modulation)  
 . phase modulation  
 . . FM/PM (modulation)

## foaming

RT data transmission

### foaming

RT beneficiation  
flotation  
foams  
metal foams  
∞ separation  
surface properties  
swirling  
wetting

### foams

UF *cellular materials (non biological)*  
GS **foams**  
. metal foams  
RT aerogels  
bubbles  
colloids  
explosion suppression  
fire extinguishers  
fire fighting  
foaming  
low density materials  
∞ materials  
polyurethane foam  
styrofoam (trademark)

*focal plane arrays*

USE **focal plane devices**

### focal plane devices

DEF Radiation sensitive devices positioned at the focal area of electromagnetic detectors. Used for focal plane arrays.  
UF *focal plane arrays*  
RT arrays  
charge coupled devices  
infrared detectors  
linear arrays  
mosaics  
photodiodes  
quantum well infrared photodetectors

### foci

GS **foci**  
. plasma focus  
RT ∞ centers  
focusing  
geometry  
loci  
∞ optics  
points (mathematics)  
resolution

### focusing

GS **focusing**  
. defocusing  
. prefocusing  
. self focusing  
RT accommodation  
adjusting  
astigmatism  
cameras  
distance  
foci  
Fresnel lenses  
geometrical optics  
gravitational lenses  
image contrast  
image enhancement  
laser cutting  
laser drilling  
lenses  
panoramic cameras  
solar reflectors  
steering  
stigmatism  
thermal lensing  
vignetting

*foetuses*

USE **fetuses**

### fog

DEF A loose term applied to visible aerosols in which the dispersed phase is liquid. Formation by condensation is usually implied. In meteorology, a dispersion of water or ice.  
GS mixtures

. dispersions  
. . colloids  
. . . aerosols  
. . . . **fog**  
. . liquid-gas mixtures  
. . . aerosols  
. . . . **fog**  
particles  
. aerosols  
. . **fog**

RT anvil clouds  
aviation meteorology  
cirrocumulus clouds  
cirrostratus clouds  
clouds (meteorology)  
drop size  
haze  
haze detection  
hydrometeors  
mist  
precipitation (meteorology)  
smog  
smoke  
steam  
stratus clouds  
visibility

### fog dispersal

GS weather modification  
. **fog dispersal**  
RT aerosols  
climatology  
cloud physics  
clouds (meteorology)  
dispersing  
dispersions  
mist  
precipitation (meteorology)

### foil bearings

GS bearings  
. **foil bearings**  
RT gas bearings  
journal bearings

### ∞ foils

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED-CONSULT THE TERMS LISTED BELOW)  
RT airfoils  
foils (materials)  
hydrofoils  
multilayer insulation

### foils (materials)

GS **foils (materials)**  
. metal foils  
RT airfoils  
∞ foils  
hydrofoils  
∞ materials  
multilayer insulation  
thin plates

### Fokker aircraft

GS **Fokker aircraft**  
. F-27 aircraft  
. F-28 transport aircraft  
RT ∞ aircraft

*Fokker bond testers*

USE **adhesion tests**

*Fokker F 27 aircraft*

USE **F-27 aircraft**

*Fokker F 28 aircraft*

USE **F-28 transport aircraft**

*Fokker Friendship aircraft*

USE **F-27 aircraft**

### Fokker-Planck equation

GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **Fokker-Planck equation**  
RT Boltzmann transport equation  
Brownian movements  
density distribution

diffusion theory  
∞ equations  
ionized gases  
stochastic processes

### folding

UF *crimping*  
RT bending  
binding  
curl (materials)  
distortion  
flexing  
kinking

### Folding Fin aircraft rocket vehicle

UF *FFAR rocket vehicle*  
GS rocket vehicles  
. **Folding Fin aircraft rocket vehicle**  
RT ∞ aircraft  
solid propellant rocket engines

### folding structures

UF *Rogallo wings*  
*telescoping structures*  
GS **folding structures**  
. sailwings  
RT antennas  
balloons  
ballutes  
expandable structures  
furlable antennas  
inflatable space structures  
inflatable structures  
paddles  
parachutes  
paragliders  
parawings  
rotary wings  
space erectable structures  
spacecraft structures  
∞ structures  
variable geometry structures  
variable sweep wings

### folds (geology)

DEF Curves or bends of a planar structure such as rock strata, bedding planes, foliation, or cleavage. Folds are usually a product of deformation, although their definition is descriptive and not genetic and may include primary structures. Used for nappes.  
UF *nappes*  
RT Earth crust  
fissures (geology)  
geological faults  
Great Basin (US)  
∞ layers  
outcrops  
rocks  
seamounts  
strata  
stratification

### foliage

RT brown wave effect  
canopies (vegetation)  
deciduous trees  
defoliant  
green wave effect  
herbicides  
leaves  
locusts  
plants (botany)  
timber vigor

### follic acid

UF *vitamin M*  
GS acids  
. amino acids  
. . **follic acid**  
. . carboxylic acids  
. . **follic acid**  
nitrogen compounds  
. **follic acid**  
organic compounds  
. amino acids  
. . **follic acid**  
. . carboxylic acids  
. . **follic acid**  
. cyclic compounds

. . heterocyclic compounds  
 . . . **folic acid**  
 vitamins  
 . **folic acid**

∞ **food**

SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)

RT alfalfa  
 barley  
 beverages  
 broths  
 caloric requirements  
 canning  
 carbohydrates  
 citrus trees  
 consumables (spacecrew supplies)  
 corn  
 decontamination  
 dehydrated food  
 diets  
 digesting  
 distributing  
 Earth resources  
 eating  
 eggs  
 fats  
 fishes  
 flour (food)  
 food chain  
 food production (in space)  
 frozen foods  
 fruits  
 gelatins  
 hay  
 leguminous plants  
 milk  
 millet  
 nutrition  
 oats  
 orchards  
 peppers  
 potatoes  
 preserving  
 proteins  
 provisioning  
 rations  
 services  
 soybeans  
 space flight feeding  
 space rations  
 spinach  
 starches  
 sugar cane  
 sugars  
 synthetic food  
 tomatoes  
 vegetables  
 vineyards  
 vitamins  
 yeast

**food chain**

DEF The scheme of feeding relationships  
 by trophic levels which unites member species  
 of a biological community.

RT animals  
 ecosystems

∞ food  
 plants (botany)

**food intake**

RT fasting  
 space flight feeding  
 synthetic food

**food processing**

DEF The transformation of foodstuffs into  
 forms for easy packaging, greater palatability,  
 longer storage, etc.

GS **food processing**  
 . canning  
 . preserving

RT dehydrated food  
 frozen foods

∞ processing

**food production (in space)**

RT closed ecological systems

consumables (spacecrew supplies)

∞ food  
 ∞ production  
 space flight feeding  
 space rations

**footprints**

DEF Ground patterns or contours of an  
 acoustical or microwave nature that are predict-  
 able and measurable.

RT aircraft noise  
 antenna radiation patterns  
 mathematical models

**forbidden bands**

GS energy bands

. **forbidden bands**

RT band structure of solids

∞ bands  
 electron energy  
 free electrons  
 lattice vibrations  
 wave equations

**forbidden transitions**

RT electron transitions  
 Franck-Condon principle  
 quantum theory  
 selection rules (nuclear physics)

∞ solid state physics

∞ transition  
 wave functions

**Forbush decreases**

DEF The observed decreases in cosmic ray  
 activity in the Earth's atmosphere about a day  
 after a solar flare. Used for Forbush effect.

UF *Forbush effect*

RT cosmic rays

∞ effects  
 magnetic storms  
 solar flares  
 solar furnaces  
 solar storms

*Forbush effect*

USE **Forbush decreases**

∞ **force**

SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)

DEF The cause of the acceleration of mate-  
 rial bodies measured by the rate of change of  
 momentum produced on a free body. Used for  
 repulsion.

UF *repulsion*  
 acceleration (physics)

RT aerodynamic forces  
 attraction  
 centrifugal force  
 centripetal force  
 electric field strength  
 high impulse  
 inertia  
 kinetics  
 lines of force  
 loads (forces)  
 Lorentz force  
 newton  
 nonconservative forces  
 null zones  
 ponderomotive forces  
 pressure  
 pulling  
 pushing  
 thrust  
 thrust measurement  
 torque  
 torsion  
 Van der Waals forces  
 weight (mass)  
 zero force curves

**force distribution**

UF *lift distribution*  
*normal force distribution*

GS distribution (property)

. **force distribution**

RT aerodynamic coefficients  
 aerodynamic loads

angular distribution  
 charge distribution  
 energy distribution  
 influence coefficient  
 lift drag ratio  
 loads (forces)  
 mass distribution  
 moment distribution  
 scale effect  
 stress concentration  
 stress distribution  
 stress intensity factors  
 sweep effect  
 thrust distribution  
 transverse loads  
 wing loading

*force fields*

USE **field theory (physics)**

**force vector recorders**

DEF Instrumentation for recording force dis-  
 placements in a variety of disciplines.

GS measuring instruments  
 . **force vector recorders**  
 recording instruments

. **force vector recorders**

RT ∞ instruments

**forced convection**

GS convection

. **forced convection**

RT blowing  
 convective heat transfer  
 free convection  
 heat transfer  
 laminar flow  
 Prandtl number  
 Rayleigh-Benard convection  
 Stanton number

*forced oscillation*

USE **forced vibration**

**forced vibration**

DEF An oscillation of a system in which the  
 response is imposed by the excitation. If the  
 excitation is periodic and continuing, the oscilla-  
 tion is steady state. Used for forced oscillation  
 and forced vibratory motion equations.

UF *forced oscillation*  
*forced vibratory motion equations*

GS vibration

. **forced vibration**

RT flutter  
 free vibration  
 random vibration  
 self excitation  
 self induced vibration

*forced vibratory motion equations*

USE **equations**

**forced vibration**

**force-free magnetic fields**

GS magnetic fields

. **force-free magnetic fields**

RT magnetic field configurations  
 magnetic flux  
 magnetohydrodynamic stability  
 solar flares  
 solar magnetic field

**forearm**

GS anatomy  
 . limbs (anatomy)  
 . . arm (anatomy)  
 . . . **forearm**  
 appendages  
 . arm (anatomy)  
 . . **forearm**

**forebodies**

GS **forebodies**

. noses (forebodies)  
 . . nose cones  
 . . . ablative nose cones  
 . . . rocket nose cones

RT afterbodies  
 aircraft structures

## forecasting

bluff bodies  
 blunt bodies  
 blunt leading edges  
 ∞ bows  
 centerbodies  
 cylindrical bodies  
 hammerhead configuration  
 leading edges  
 sharp leading edges

### forecasting

UF *forecasts*  
 GS predictions  
 . **forecasting**  
 . . . technological forecasting  
 . . . Delphi method (forecasting)  
 . . . pattern method (forecasting)  
 . . . probe method (forecasting)  
 . . . profile method (forecasting)  
 . . . weather forecasting  
 . . . long range weather forecasting  
 . . . nowcasting  
 . . . numerical weather forecasting  
 . . . statistical weather forecasting

RT ∞ analyzing  
 budgeting  
 confidence limits  
 correlation  
 curve fitting  
 estimates  
 estimating  
 evaluation  
 expectation  
 extrapolation  
 hindcasting  
 management  
 management methods  
 management planning  
 mathematical models  
 maximum likelihood estimates  
 mission planning  
 noise prediction (aircraft)  
 operations research  
 planning  
 probability theory  
 project planning  
 ∞ projection  
 regression analysis  
 regression coefficients  
 reliability  
 reserves  
 risk  
 scheduling  
 statistical analysis  
 statistical distributions  
 systems engineering  
 time series analysis  
 trends

### *forecasts*

USE **forecasting**

### forehead

GS anatomy  
 . face (anatomy)  
 . . **forehead**  
 RT head (anatomy)  
 skull

### foreign bodies

RT aircraft hazards  
 ∞ bodies  
 injuries  
 meteorites

### foreign policy

GS policies  
 . **foreign policy**  
 . . international relations  
 . . . international cooperation  
 . . . . outer space treaty  
 RT ∞ budgets  
 European space programs

International Hydrological Decade

### *foreign trade*

USE **international trade**

### *forensic sciences*

USE **law (jurisprudence)**

### forest fire detection

GS detection  
 . **forest fire detection**  
 RT aerial photography  
 ∞ detectors  
 haze detection  
 infrared detectors  
 infrared instruments  
 infrared photography  
 infrared radiometers  
 infrared scanners  
 measuring instruments  
 radiometers  
 satellite-borne photography  
 surveillance

### forest fires

GS fires  
 . **forest fires**  
 RT air pollution  
 ashes  
 biomass burning  
 combustion  
 fire prevention  
 firebreaks  
 flames  
 forests  
 smoke  
 wastes

### forest management

GS management  
 . resources management  
 . . **forest management**  
 . . . reforestation  
 RT conservation  
 Earth resources  
 forests  
 land use  
 regional planning  
 timber inventory

### forests

UF *lumbering areas*  
 GS resources  
 . Earth resources  
 . . **forests**  
 . . . rain forests  
 RT Amazon region (South America)  
 canopies (vegetation)  
 clearings (openings)  
 conifers  
 conservation  
 deciduous trees  
 defoliants  
 defoliation  
 deforestation  
 firebreaks  
 forest fires  
 forest management  
 herbicides  
 logging (industry)  
 plants (botany)  
 reforestation  
 regional planning  
 silviculture  
 timber identification  
 timber inventory  
 timber vigor  
 timberline  
 trees (plants)  
 wilderness

### forging

UF *metal forging*  
 GS forming techniques  
 . **forging**  
 metal working  
 . **forging**  
 RT ausforming  
 billets

bulging  
 casting  
 coining  
 cold working  
 heat treatment  
 hot isostatic pressing  
 hot pressing  
 hot working  
 piercing  
 pressing (forming)  
 rheocasting  
 ∞ rolling  
 squeeze casting  
 stamping

### forks

RT conveyors  
 hooks

### *form*

USE **shapes**

### form factors

RT approximation  
 coupling coefficients  
 functional analysis  
 harmonic analysis  
 rectifiers  
 scattering coefficients  
 series (mathematics)  
 square waves  
 transducers  
 ∞ variable  
 waveforms  
 x ray scattering

### *form perception*

USE **space perception**

### formaldehyde

GS aldehydes  
 . **formaldehyde**  
 RT phenol formaldehyde

### formalism

RT computer programming  
 dynamic programming  
 hardware description languages  
 linear programming  
 ∞ logic  
 nonlinear programming  
 parameterization  
 programming languages

### format

RT computer programming  
 documents  
 editing  
 frames (data processing)  
 printouts  
 records  
 syntax  
 texts

### formates

GS **formates**  
 . chloroformate  
 . nitroformates  
 RT formic acid  
 formyl ions

### ∞ formation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED -- CONSULT THE TERMS LISTED BELOW)  
 RT formations  
 growth  
 nucleation  
 stratigraphy

### formation flying

(added October 2001)

DEF Coordinated and closely synchronized flight of two or more aircraft or spacecraft in a relatively close spatial configuration.

UF *flying in formation*

GS positioning

. **formation flying**

RT aerobatics  
 air navigation  
 aircraft maneuvers

- ∞ flight
  - flight control
  - orbital maneuvers
  - satellite constellations
  - satellite control
  - satellite networks
  - space navigation
  - spacecraft control
  - spacecraft guidance
  - spacecraft maneuvers
  - stationkeeping
- formation heat*
  - USE **heat of formation**
- formations**
  - RT contacts (geology)
  - ∞ formation
    - fracturing
    - gas injection
    - geological faults
    - geology
    - geophysics
    - Great Basin (US)
  - ∞ layers
    - mountains
    - outcrops
    - outliers (landforms)
    - paleontology
    - perforating
    - permeability
    - petrology
    - porosity
    - rocks
    - shatter cones
    - soils
    - stairsteps
    - stratigraphy
    - terraces (landforms)
    - wettability
- formhydroxamic acid**
  - GS acids
    - . carboxylic acids
    - . . **formhydroxamic acid**
  - nitrogen compounds
    - . amides
    - . . **formhydroxamic acid**
  - organic compounds
    - . carboxylic acids
    - . . **formhydroxamic acid**
- formic acid**
  - GS acids
    - . carboxylic acids
    - . . **formic acid**
  - organic compounds
    - . carboxylic acids
    - . . **formic acid**
  - RT formates
    - formyl ions
- formica**
  - RT laminates
  - ∞ polymers
    - thermosetting resins
- forming techniques**
  - SN (TECHNIQUES OF SHAPING ITEM)
  - UF *metal forming*
  - GS **forming techniques**
    - . casting
      - . . centrifugal casting
      - . . investment casting
      - . . propellant casting
      - . . rheocasting
      - . . sand casting
      - . . slip casting
      - . . squeeze casting
    - . cold working
      - . . cold rolling
      - . . electrohydraulic forming
      - . . explosive forming
      - . . electroforming
    - . extruding
      - . . pultrusion
    - . forging
      - . hot working
      - . . ausforming
    - . injection molding
- . magnetic forming
- . metal drawing
- . metal spinning
- . . hydrosponning
- . pressing (forming)
- . . blanking (cutting)
- . . coining
- . . hot pressing
- . . stamping
- . . . hot isostatic pressing
- . resin transfer molding
- . roll forming
- RT ∞ blanking
  - cutting
  - deposition
  - electromagnetic hammers
  - hot machining
  - laser cutting
  - machining
  - metal grinding
  - metal working
  - spraying
  - upsetting
- forms (paper)**
  - RT blanks
    - data acquisition
- ∞ **formulas**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT computation
    - formulas (mathematics)
    - formulations
    - Kramers-Kronig formula
- formulas (mathematics)**
  - UF *expressions (mathematics)*
  - GS mathematical logic
    - . **formulas (mathematics)**
    - . . Bethe-Heitler formula
  - RT ∞ formulas
    - ∞ mathematics
- formulations**
  - RT admixtures
    - ∞ composition
    - ∞ formulas
      - ingredients
      - mixtures
      - parameterization
      - stoichiometry
- formyl ions**
  - GS ions
    - . molecular ions
    - . . **formyl ions**
    - . positive ions
    - . . cations
    - . . . **formyl ions**
    - radicals
    - . **formyl ions**
  - RT atmospheric chemistry
    - formates
    - formic acid
    - hydroxyl radicals
    - interstellar chemistry
    - interstellar matter
- forsterite**
  - GS magnesium compounds
    - . **forsterite**
  - minerals
    - . olivine
    - . . **forsterite**
  - silicon compounds
    - . silicates
    - . . **forsterite**
  - RT refractories
- Forth (programming language)**
  - (added December 1992)
  - GS languages
    - . programming languages
    - . . **Forth (programming language)**
  - RT computer programming
- Fortisan (trademark)**
  - GS biopolymers
    - . polysaccharides
  - . cellulose
  - . . **Fortisan (trademark)**
  - fabrics
    - . **Fortisan (trademark)**
  - fibers
    - . synthetic fibers
    - . . **Fortisan (trademark)**
  - organic compounds
    - . carbohydrates
    - . . polysaccharides
    - . . . cellulose
    - . . . **Fortisan (trademark)**
  - RT parachute fabrics
- FORTAN**
  - UF *FAB (programming language)*
  - GS languages
    - . programming languages
    - . . **FORTAN**
  - RT Cobol
    - compilers
    - computer programming
    - PL/1
- forward facing steps**
  - (added December 1995)
  - RT backward facing steps
    - boundary layer flow
    - separated flow
- forward looking infrared detectors*
  - USE **FLIR detectors**
- forward scattering**
  - DEF The scattering of radiant energy into the hemisphere of space bounded by a plane normal to the direction of the incident radiation and lying on the side toward which the incident radiation was advancing; the opposite of backward scatter.
  - GS scattering
    - . **forward scattering**
  - RT backscattering
    - inverse scattering
    - light scattering
    - nuclear scattering
    - scatter propagation
- fossil fuels**
  - DEF A general term for any hydrocarbons that may be used for fuel; chiefly petroleum, natural gas, and coal.
  - GS fuels
    - . chemical fuels
    - . . hydrocarbon fuels
    - . . . **fossil fuels**
    - . . . . coal
    - . . . . . anthracite
    - . . . . . lignite
    - . . . . . solvent refined coal
    - . . . . crude oil
    - . . . . natural gas
    - . . . . liquefied natural gas
    - . . . . peat
    - . . . shale oil
    - resources
      - . Earth resources
      - . . **fossil fuels**
      - . . . coal
      - . . . . anthracite
      - . . . . lignite
      - . . . . solvent refined coal
      - . . . crude oil
      - . . . natural gas
      - . . . . liquefied natural gas
      - . . . peat
      - . . . shale oil
  - RT carbonaceous materials
    - underwater resources
- fossil meteorite craters*
  - USE **fossils meteorite craters**
- fossils**
  - DEF Remains, traces, or imprints of an organism preserved in the Earth's crust sometime in the geologic past. Used for fossil meteorite craters.
  - UF *fossil meteorite craters*



## Foster theory

RT archaeology  
paleobiology  
paleontology  
particle tracks  
radioactive age determination

### Foster theory

RT network analysis  
reactance  
resonance  
∞ theories

### fouling

GS **fouling**  
. antifouling  
RT biofilms  
contamination  
corrosion  
deposition  
ice formation  
plugging  
retarding

### foundations

UF *bases (foundations)*  
*structural foundations*  
GS **foundations**  
. pile foundations  
RT basements  
∞ bases  
caissons  
concrete structures  
excavation  
geotechnical engineering  
overconsolidation  
∞ pad  
pavements  
skirts  
structural members  
∞ structures  
substructures  
supports  
underground structures

### foundries

GS industrial plants  
. **foundries**  
RT furnaces  
∞ metallurgy  
molds

### four body problem

RT celestial mechanics  
many body problem  
orbits  
perturbation  
∞ problems  
three body problem

### Fourier analysis

DEF The representation of physical or mathematical data by the use of the Fourier series of Fourier integral.

GS analysis (mathematics)  
. **Fourier analysis**  
. . . Fourier series  
RT autocorrelation  
data compression  
differential equations  
divergence  
exponential functions  
frequency distribution  
harmonic analysis  
harmonic excitation  
harmonic functions  
harmonic generations  
harmonic oscillation  
harmonics  
information theory  
kurtosis  
linear transformations  
measure and integration  
operational calculus  
periodic functions  
periodic variations  
real variables  
simple harmonic motion  
time series analysis

wavelet analysis

### Fourier law

GS laws  
. **Fourier law**  
RT thermal conductivity

### Fourier series

GS analysis (mathematics)  
. calculus  
. . . series (mathematics)  
. . . **Fourier series**  
. Fourier analysis  
. . **Fourier series**  
. real variables  
. . series (mathematics)  
. . . **Fourier series**  
RT Gibbs phenomenon

### Fourier transformation

GS analysis (mathematics)  
. functional analysis  
. . integral transformations  
. . . **Fourier transformation**  
. . . . fast Fourier transformations  
functions (mathematics)  
. **Fourier transformation**  
. . fast Fourier transformations  
transformations (mathematics)  
. integral transformations  
. . **Fourier transformation**  
. . . fast Fourier transformations  
RT BBGKY hierarchy  
Gabor transformation  
holographic spectroscopy  
maximum entropy method  
Walsh function  
wavelet analysis

### Fourier-Bessel transformations

GS analysis (mathematics)  
. calculus  
. . **Fourier-Bessel transformations**  
. functional analysis  
. . integral transformations  
. . . **Fourier-Bessel transformations**  
. real variables  
. . **Fourier-Bessel transformations**  
functions (mathematics)  
. **Fourier-Bessel transformations**  
transformations (mathematics)  
. integral transformations  
. . **Fourier-Bessel transformations**  
RT differential equations  
series (mathematics)

### four-wave mixing

(added April 1992)  
GS conjugation  
. phase conjugation  
. . **four-wave mixing**  
RT atom optics  
coherent light  
collimation  
laser beams  
light amplifiers  
light beams  
nonlinear optics  
optical bistability  
phase coherence  
signal mixing  
wave interaction

### fovea

DEF The central part of the retina, which contains a high concentration of the color sensitive receptors known as cones.

GS anatomy  
. sense organs  
. . eye (anatomy)  
. . . retina  
. . . . **fovea**  
RT Saccadic eye movements

### FR-1 satellite

GS artificial satellites  
. French satellites

. . **FR-1 satellite**

### fractals

DEF Highly irregular geometrical figures such as snowflakes or the boundary of a cloud whose capacity dimension is not an integer. The capacity dimension characterizes the measuring of the number of different size superimposed squares needed to cover the geometric shape. By the use of differing size boxes, one is able to determine the capacity dimension.

GS dimensions  
. **fractals**  
geometry  
. **fractals**  
RT ∞ applications of mathematics  
coordinates  
exponents  
half spaces  
∞ mathematics  
ratios  
set theory  
∞ space  
strange attractors

### fractionation

GS **fractionation**  
. chemical fractionation  
. hydrocracking  
RT refining  
retort processing  
∞ separation  
solvent refined coal

### fractions

SN (EXCLUDES MATHEMATICAL CONCEPTS)  
RT ∞ components  
fines  
particle size distribution  
ratios

### fractography

GS imagery  
. photography  
. . **fractography**  
RT brittleness  
crack closure  
crack geometry  
crack propagation  
ductility  
Elber equation  
fatigue (materials)  
fractures (materials)  
∞ metallurgy

### fracture mechanics

UF *fault mechanics*  
*Mohr circles*  
GS mechanics (physics)  
. solid mechanics  
. . **fracture mechanics**  
RT bend tests  
burst tests  
caustics (optics)  
computational mechanics  
crack bridging  
crack closure  
crack initiation  
crack opening displacement  
crack propagation  
Elber equation  
finite element method  
fracturing  
Griffith crack  
hole geometry (mechanics)  
isoparametric finite elements  
J integral  
micromechanics  
plane strain  
residual strength  
rock mechanics  
rupturing  
short cracks  
soil mechanics  
strain distribution  
stress distribution  
stress intensity factors  
stress tensors

time temperature parameter

*fracture resistance*

USE **fracture strength**

### fracture strength

DEF The normal stress at the beginning of fracture. Fracture strength is calculated from the load at the beginning of fracture during a tension test and the original cross-sectional area of the specimen. Used for fracture resistance and fracture toughness.

UF *fracture resistance*  
*fracture toughness*

GS mechanical properties  
. **fracture strength**  
. . flexural strength

RT bend tests  
brittle materials  
brittleness  
burst tests  
carbon-carbon composites  
crack closure  
crack initiation  
crack opening displacement  
crack propagation  
creep rupture strength  
ductile-brittle transition  
ductility  
earthquake resistance  
eutectic composites  
hardness  
J integral  
load carrying capacity  
residual strength  
∞ resistance  
retirement for cause  
∞ strength  
toughness  
yield strength

*fracture toughness*

USE **fracture strength**

### fractures (materials)

GS **fractures (materials)**

. cracks  
. . crack tips  
. . edge cracks  
. . microcracks  
. . short cracks  
. . surface cracks

RT crack opening displacement  
damage  
deformation  
failure  
fractography  
∞ materials

### fracturing

GS **fracturing**

. cracking (fracturing)  
. . stress corrosion cracking  
. crustal fractures

RT brittleness  
chipping  
crack closure  
crack opening displacement  
crack propagation  
cutting  
flaking  
formations  
fracture mechanics  
fragmentation  
fragments  
metal fatigue  
perforating  
∞ separation  
spalling  
splitting  
stress functions  
structural failure

### fragmentation

UF *shattering*

RT acoustic streaming  
breaking  
bursts  
chipping  
comminution

fracturing  
fragments  
penetration  
Sabot projectiles  
shrapnel  
spalling  
terminal ballistics

### fragments

RT chips  
debris  
ejecta  
fracturing  
fragmentation  
shrapnel

### frame photography

GS imagery  
. photography  
. . **frame photography**  
RT black and white photography  
framing cameras  
high speed cameras

### frames

GS **frames**  
. airframes  
. chassis  
. undercarriages  
RT carriages  
springs (elastic)  
∞ structures  
struts  
supports  
trusses

### frames (data processing)

RT data management  
data processing  
format  
image processing

### framing cameras

GS optical equipment  
. cameras  
. . high speed cameras  
. . . **framing cameras**  
photographic equipment  
. cameras  
. . high speed cameras  
. . . **framing cameras**  
RT frame photography  
rotating mirrors

### France

GS nations  
. **France**  
. . French Guiana  
. . Guadeloupe  
. . Martinique  
RT Andorra  
English Channel  
Europe  
French space program  
Pyrenees Mountains (Europe)  
Rhône Delta (France)

### francium

GS chemical elements  
. alkali metals  
. . **francium**  
metals  
. alkali metals  
. . **francium**

### Franck-Condon principle

RT Born-Oppenheimer approximation  
color centers  
conduction bands  
electron transitions  
forbidden transitions  
optical transition

### Fraunhofer line discriminators

GS circuits  
. discriminators  
. . **Fraunhofer line discriminators**  
RT absorption spectra  
luminescence  
measuring instruments

spectroscopic analysis  
spectroscopy

### Fraunhofer lines

DEF Dark lines in the absorption spectrum of solar radiation due to absorption by gases in the outer portions of the sun and in the Earth's atmosphere.

GS spectra  
. radiation spectra  
. . absorption spectra  
. . . **Fraunhofer lines**  
. . electromagnetic spectra  
. . . line spectra  
. . . . **Fraunhofer lines**  
. spectral bands  
. . absorption spectra  
. . . **Fraunhofer lines**  
RT absorption spectroscopy  
optogalvanic spectroscopy  
solar spectra

*Fraunhofer region*

USE **far fields**

### Fredholm equations

UF *Fredholm operators*  
GS analysis (mathematics)  
. functional analysis  
. . integral equations  
. . . **Fredholm equations**  
RT ∞ equations  
ill-posed problems (mathematics)  
Pomeranchuk theorem

*Fredholm operators*

USE **Fredholm equations operators (mathematics)**

### free atmosphere

DEF That portion of the Earth's atmosphere, above the planetary boundary layer, in which the effect of the Earth's surface friction on the air is negligible, and in which the air is usually treated (dynamically) as an ideal fluid. The base of the free atmosphere is usually taken as the geostrophic wind level.

GS Earth atmosphere  
. **free atmosphere**  
RT biosphere  
middle atmosphere  
primitive Earth atmosphere

### free boundaries

GS boundaries  
. **free boundaries**  
RT fluid boundaries  
interfaces  
jet flow  
jet mixing flow  
jet streams (meteorology)  
liquid surfaces  
liquid-liquid interfaces  
liquid-vapor interfaces

### free convection

UF *natural convection*  
*thermal convection*  
GS convection  
. **free convection**  
. . Rayleigh-Benard convection  
. . . Benard cells  
RT convection currents  
convective flow  
convective heat transfer  
forced convection  
laminar flow  
Marangoni convection  
porous boundary layer control  
solar convection (astronomy)  
stellar convection  
temperature  
thermosiphons  
turbulent flow

### free electron lasers

DEF Multifrequency lasers utilizing optical radiation amplification by a beam of free electrons passing through a vacuum in a transverse periodic magnetic field, as opposed to conven-

## free electrons

tional lasers in which the oscillating electrons are bound to atoms and molecules and have a specific wavelength.

- GS stimulated emission devices
  - . lasers
  - . . **free electron lasers**
- RT diffraction radiation
  - wiggler magnets

### free electrons

- DEF Electrons which are not bound to an atom.
- GS charge carriers
  - . **free electrons**
  - . particles
  - . charged particles
  - . . energetic particles
  - . . . electrons
  - . . . . **free electrons**
  - . corpuscular radiation
  - . . energetic particles
  - . . . electrons
  - . . . . **free electrons**
  - . elementary particles
  - . . fermions
  - . . . leptons
  - . . . . electrons
  - . . . . . **free electrons**
- RT Brillouin zones
  - conduction electrons
  - electron avalanche
  - electron density (concentration)
  - electron gas
  - forbidden bands
  - plasma frequencies
  - recombination coefficient

### free energy

- GS thermodynamic properties
  - . **free energy**
  - . . Gibbs free energy
- RT chemical energy
  - ∞ energy
  - energy of formation
  - enthalpy
  - Gibbs-Helmholtz equations
  - internal energy
  - ∞ level
  - molecular energy levels
  - thermal energy
  - thermodynamics

### free fall

- DEF The fall or drop of a body, such as a rocket, not guided, not under thrust, and not retarded by a parachute or a braking device. The free and unhampered motion of a body along a Keplerian trajectory, in the force of gravity is counterbalanced by the force of inertia.
- RT air drop operations
  - ballistic trajectories
  - falling spheres
  - parachute descent
  - parafoils
  - weightlessness

### free flight

- DEF Unconstrained or unassisted flight, as in the flight of a rocket after consumption of its propellant or after motor shutoff, in the flight of an unguided projectile, and in the flight in certain kinds of wind tunnels of unmounted models.
- RT ∞ flight
  - gliders
  - gliding
  - hang gliders

### free flight test apparatus

- RT flight tests
  - ∞ test equipment

### free flow

- UF *free stream effects*
  - free streams*
- GS fluid flow
  - . **free flow**
- RT void ratio

### free jets

- DEF Fluid jets without solid boundaries,

such as a jet discharging into the open.

- GS fluid jets
  - . **free jets**
- RT jet boundaries
  - jet flow
  - ∞ jets

### free molecular flow

- GS fluid flow
  - . gas flow
  - . . **free molecular flow**
- RT continuum flow
  - kinetic theory
  - Knudsen flow
  - molecular beams
  - rarefied gas dynamics
  - rarefied gases
  - slip flow
  - transition flow

### free oscillations

- USE **free vibration**

### free radicals

- DEF Atoms or groups of atoms broken away from stable compounds by application of external energy, and, although containing unpaired electrons, remaining free for transitory or longer periods.
- GS radicals
  - . **free radicals**
  - . . hydroxyl radicals
- RT amino radical
  - atoms
  - carbenes
  - ions
  - negative ions
  - oxygen ions
  - trivalent ions
  - vinyl radical

### free stream effects

- USE **free flow**

### free streams

- USE **free flow**

### free vibration

- DEF Oscillation of a system in the absence of external forces. Used for free oscillations.
- UF *free oscillations*
- GS vibration
  - . **free vibration**
- RT forced vibration
  - linear vibration
  - Mindlin plates
  - proton precession
  - self excitation
  - self induced vibration
  - vibration mode

### free wing aircraft

- RT aerodynamics
  - ∞ aircraft
  - aircraft design
  - control surfaces

### Freedom Fighter aircraft

- USE **F-5 aircraft**

### Freedom Space Station

- USE **Space Station Freedom**

### free-piston engines

- DEF Engines in which the pistons are not connected to the crank.
- GS engines
  - . piston engines
  - . . **free-piston engines**
- RT AC generators
  - linear alternators
  - pistons
  - spacecraft power supplies
  - Stirling engines

### free-space optical communication

- (added June 1998)
- GS telecommunication
  - . communication
  - . . optical communication
  - . . . **free-space optical**

### communication

- RT high power lasers
  - laser beams
  - satellite communication
  - space communication

### free-space optical interconnects

- (added June 1998)
- UF *FSOI (integrated optics)*
- GS optical interconnects
  - . **free-space optical interconnects**
- RT integrated optics
  - interprocessor communication
  - optical computers
  - optical switching
  - optoelectronic devices
  - photonics

### freeze drying

- GS drying
  - . **freeze drying**
- RT dehydrated food
  - dehydration
  - freezing
  - frozen foods
  - preserving

### freezing

- GS phase transformations
  - . **freezing**
  - . . vibrational freezing
  - . . . zone melting
- RT antifreezes
  - bay ice
  - cloud glaciation
  - cold traps
  - cooling
  - cryogenic cooling
  - crystallization
  - freeze drying
  - frost
  - ice formation
  - ice nuclei
  - low temperature
  - melting
  - preserving
  - pressure ice
  - refrigerating
  - sea ice
  - solidification
  - solidified gases

### freezing points

- USE **melting points**

### freight

- USE **cargo**

### freight costs

- GS costs
  - . **freight costs**
- RT cargo
  - freighters
  - transportation

### freighters

- RT freight costs
  - harbors
  - transportation
  - wharves

### French Equatorial Congo

- USE **Congo (Brazzaville)**

### French Guiana

- GS nations
  - . France
  - . . **French Guiana**
- RT Caribbean region
  - South America

### French satellites

- GS artificial satellites
  - . **French satellites**
  - . . D-1 satellite
  - . . D-2 satellites
  - . . EOLE satellites
  - . . FR-1 satellite
  - . . GEOLE satellites
  - . . PEOLE satellites

- .. Poseidon satellite
- .. SPOT (French satellite)
- .. SRET satellites
- ... SRET 1 satellite
- ... SRET 2 satellite
- RT European space programs
- METEOSAT satellite
- Symphonie satellites

#### French space program

(added December 1990)

- GS programs
- space programs
- European space programs
- ... **French space program**

- RT EOLE satellites
- France
- GEOLE satellites
- Granat satellite
- Hermes manned spaceplane
- international cooperation
- METEOSAT satellite
- ∞ research projects
- space exploration
- space missions
- ∞ spacecraft
- SRET 1 satellite
- SRET satellites

#### Frenkel defects

- GS defects
- crystal defects
- point defects
- ... vacancies (crystal defects)
- ... **Frenkel defects**

#### freon

- RT air conditioning
- coolants
- cooling
- cooling systems
- fluorohydrocarbons
- gas cooling
- refrigerants
- refrigerating

#### frequencies

DEF Of a function periodic in time, the reciprocals of primitive periods. The unit is the cycle per unit time and must be specified. Used for frequency bands.

- UF *frequency bands*

- GS **frequencies**

- acoustic frequencies
- audio frequencies
- ... queffencies
- screech tones
- beat frequencies
- broadband
- Brunt-Vaisala frequency
- carrier frequencies
- critical frequencies
- cyclotron frequency
- infrasonic frequencies
- ionization frequencies
- maximum usable frequency
- Nyquist frequencies
- plasma frequencies
- radio frequencies
- ... extremely low frequencies
- ... high frequencies
- ... intermediate frequencies
- ... low frequencies
- ... very low frequencies
- ... microwave frequencies
- ... C band
- ... extremely high frequencies
- ... P band
- ... superhigh frequencies
- ... ultrahigh frequencies
- ... P band
- ... very high frequencies
- ... P band
- resonant frequencies
- subaudible frequencies
- sweep frequency

- RT aeolian tones
- amplitudes
- ∞ bands
- bandwidth

- broadband amplifiers
- channel capacity
- ∞ channels
- frequency distribution
- frequency ranges
- frequency reuse
- harmonics
- line spectra
- longitudinal waves
- microchannels
- millimeter waves
- narrowband
- ∞ pitch
- radio waves
- spectral bands
- standing waves
- submillimeter waves
- superharmonics

#### frequency analyzers

- RT harmonic analysis
- intermodulation
- oscilloscopes
- selective fading
- signal analysis
- spectrum analysis
- sweep frequency
- ∞ test equipment
- vibration measurement

#### frequency assignment

DEF The specific frequency or frequencies authorized by competent authority; expressed for each channel by: (a) the authorized carrier frequency, the frequency tolerance, and the authorized emission bandwidth, (b) the authorized emission bandwidth in reference to a specific assigned frequency (when a carrier does exist), or (c) the authorized frequency band (when a carrier does not exist).

- RT communicating
- frequency reuse
- maximum usable frequency
- orbit spectrum utilization

#### frequency bands

- USE **frequencies**

#### frequency compression demodulators

- GS demodulators
- frequency compression demodulators**

#### frequency control

- UF *frequency regulation*
- GS **frequency control**
- automatic frequency control
- RT autodynes
- ∞ control
- crystal oscillators
- frequency pulling
- quartz crystals
- signal stabilization

#### frequency conversion

- USE **frequency converters**

#### frequency converters

- UF *frequency conversion*
- frequency translation*
- GS **frequency converters**
- down-converters
- frequency dividers
- frequency multipliers
- frequency synthesizers
- parametric frequency converters
- up-converters
- RT ∞ conversion
- ∞ converters
- harmonic generators
- mixing circuits
- parametric amplifiers
- pulse width amplitude converters

#### frequency discriminators

DEF Electronic circuits which deliver output voltages proportional to the deviations of signals from predetermined frequency values.

- GS circuits
- discriminators

#### frequency discriminators

#### frequency distribution

- SN (OF CYCLIC VARIATIONS)
- GS distribution (property)
- frequency distribution**
- kurtosis
- RT cycles
- Fourier analysis
- frequencies
- subaudible frequencies

#### frequency dividers

- GS frequency converters
- frequency dividers**
- RT down-converters

#### frequency division multiple access

DEF A method of providing multiple access to communication satellites in which the transmissions from a particular Earth station occupy a particular assigned frequency band. In the satellite, the signals are simultaneously amplified and transposed to a different frequency band and retransmitted. The Earth station identifies its receiving channel according to its assigned frequency band in the satellite signal. Used for FDMA.

- UF *FDMA*

- GS telecommunication

- multiple access
- ... **frequency division multiple access**

- transmission
- signal transmission
- ... data transmission
- ... multiple access
- ... **frequency division multiple access**

- RT Aloha system
- code division multiple access
- code division multiplexing
- multiplexing
- radio communication
- time division multiple access

#### frequency division multiplexing

DEF The combining of a number of signals to share a medium by dividing it into different frequency bands for each signal.

- GS transmission
- multiplexing
- ... **frequency division multiplexing**

- RT carrier frequencies
- communication networks
- data transmission
- demultiplexing
- multiple access
- pulse communication
- radio communication
- satellite transmission
- telecommunication
- time division multiplexing
- wavelength division multiplexing

#### frequency domain analysis

(added April 1999)

- GS analysis (mathematics)

- frequency domain analysis**

- RT control systems design
- dynamic response
- frequency response
- parameter identification
- signal processing

#### frequency hopping

DEF Random changing of frequencies in transmission to mislead or prevent interception by unauthorized equipment.

- RT frequency reuse
- frequency shift keying
- jamming
- spread spectrum transmission
- transmission efficiency

#### frequency measurement

- RT acoustic measurement
- ∞ measurement
- time measurement

# frequency modulation

vibration measurement

## frequency modulation

DEF Angle modulation of a sine wave carrier in which the instantaneous frequency of the modulated wave differs from the carrier frequency by an amount proportional to the instantaneous value of the modulating wave.

UF *FM (modulation)*

GS coding

. signal encoding

. . . **frequency modulation**

. . . feedback frequency modulation

. . . FM/PM (modulation)

. . . frequency shift keying

. . . pulse frequency modulation

modulation

. **frequency modulation**

. . feedback frequency modulation

. . FM/PM (modulation)

. . frequency shift keying

. . pulse frequency modulation

RT amplitude modulation

automatic frequency control

capture effect

carrier to noise ratios

companding

demodulation

demodulators

intermodulation

light modulation

line of sight communication

modulators

phase modulation

pulse frequency modulation telemetry

pulse modulation

vocoders

voltage controlled oscillators

## frequency modulation photomultipliers

GS amplifiers

. current amplifiers

. . photomultiplier tubes

. . . **frequency modulation**

**photomultipliers**

electron tubes

. cold cathode tubes

. . phototubes

. . . photomultiplier tubes

. . . . **frequency modulation**

**photomultipliers**

RT cathodes

vacuum tube oscillators

## frequency multipliers

GS frequency converters

. **frequency multipliers**

RT phase matching

## frequency pulling

(added July 1991)

UF *pulling (frequency stability)*

RT distortion

frequency control

frequency shift

frequency stability

laser outputs

laser stability

oscillators

stable oscillations

tuning

## frequency ranges

DEF Specifically designated parts of the frequency spectrum.

GS range (extremes)

. **frequency ranges**

. . octaves

. . radio range

. . subaudible frequencies

RT acoustic frequencies

bandwidth

dynamic range

frequencies

frequency response

frequency reuse

*frequency regulation*

USE **frequency control**

## frequency response

UF *phase response*

GS responses

. **frequency response**

RT acuity

broadband

distributed amplifiers

dynamic characteristics

dynamic range

dynamic response

equalizers (circuits)

excitation

frequency domain analysis

frequency ranges

linear filters

linear receivers

log periodic antennas

logarithmic receivers

perception

pulse repetition rate

ramp functions

sensitivity

smear

spectral sensitivity

step functions

stroking tests

thresholds (perception)

## frequency reuse

DEF A digital satellite communication technique which features the reuse of frequency bands in a downlink transmission to provide high power utilization and flexible accommodation of dynamic source destination traffic patterns.

RT data links

downlinking

frequencies

frequency assignment

frequency hopping

frequency ranges

maximum usable frequency

microwave transmission

radio transmission

satellite transmission

uplinking

## frequency scanning

GS scanning

. **frequency scanning**

RT panoramic scanning

radar scanning

spectrum analysis

sweep circuits

sweep frequency

## frequency shift

RT Brillouin effect

Doppler effect

Doppler-Fizeau effect

frequency pulling

gyrotropism

$\infty$  shift

## frequency shift keying

DEF That form of frequency modulation in which the modulating wave shifts the output frequency between predetermined values, and the output wave is coherent with no phase discontinuity.

GS coding

. signal encoding

. . frequency modulation

. . . **frequency shift keying**

keying

. **frequency shift keying**

modulation

. frequency modulation

. . **frequency shift keying**

RT frequency hopping

radio transmission

## frequency stability

UF *acoustic stability*

GS dynamic characteristics

. dynamic stability

. . **frequency stability**

stability

. dynamic stability

. . . **frequency stability**

RT crystal oscillators

frequency pulling

laser stability

oscillators

quartz crystals

stable oscillations

voltage controlled oscillators

## frequency standards

GS standards

. **frequency standards**

RT atomic clocks

gas masers

ion storage

masers

resonators

time signals

time synchronization

## frequency synchronization

GS synchronism

. **frequency synchronization**

RT bit synchronization

capture effect

homodyne reception

sweep frequency

synchronized oscillators

syntony

time synchronization

## frequency synthesizers

GS frequency converters

. **frequency synthesizers**

signal generators

. **frequency synthesizers**

RT mixing circuits

oscillators

synthesizers

*frequency translation*

USE **frequency converters**

## fresh water

DEF Water in rivers, lakes, springs, etc. containing no significant amounts of dissolved salts.

GS water

. **fresh water**

RT AgRISTARS project

aquifers

ground water

limnology

potable water

reservoirs

springs (water)

## Fresnel diffraction

GS diffraction

. **Fresnel diffraction**

RT gratings (spectra)

interferometry

speckle interferometry

## Fresnel integrals

UF *Fresnel-Kirchhoff integrals*

GS functions (mathematics)

. **Fresnel integrals**

RT diffraction patterns

trigonometric functions

wave diffraction

## Fresnel lenses

DEF Thin lenses constructed with stepped setbacks so as to have the optical properties of much thicker lenses.

GS lenses

. **Fresnel lenses**

RT focusing

$\infty$  optics

## Fresnel reflectors

DEF Devices characterized by a set of mirrors with varying orientation arranged so as to have the optical properties of a smooth reflector, e.g., parabolic reflector.

GS mirrors

. **Fresnel reflectors**  
reflectors  
 . **Fresnel reflectors**  
 RT interferometry  
slits  
speckle interferometry

**Fresnel region**  
 DEF The region between the antenna and the Fraunhofer region.  
 GS regions  
 . **Fresnel region**  
 RT antenna radiation patterns  
diffraction patterns  
far fields

*Fresnel-Kirchhoff integrals*  
 USE **Fresnel integrals**

**fretting**  
 RT erosion  
fatigue (materials)  
tribology  
wear tests

**fretting corrosion**  
 GS corrosion  
 . **fretting corrosion**  
 RT fatigue (materials)  
stress corrosion  
wear

**friction**  
 DEF The resistance to the relative motion of one body sliding, rolling, or flowing over another body with which it is in contact.  
 GS **friction**  
 . dry friction  
 . flow resistance  
 . . friction drag  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . . viscous drag  
 . internal friction  
 . kinetic friction  
 . . sliding friction  
 . skin friction  
 . . friction drag  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . . viscous drag  
 . static friction  
 RT abrasion  
coefficient of friction  
drag  
drag reduction  
energy dissipation  
fluid flow  
mechanical impedance  
 ∞ pressure drop  
scoring  
stiction  
surface properties  
surface roughness  
traction  
tribology  
triboluminescence  
tribometers  
wear  
wear tests  
wheel brakes

*friction coefficient*  
 USE **coefficient of friction**

**friction drag**  
 UF *nonequilibrium drag*  
 GS dynamic characteristics  
 . drag  
 . . **friction drag**  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . . viscous drag  
 friction  
 . flow resistance  
 . . **friction drag**  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . . viscous drag  
 . skin friction

. . **friction drag**  
 . . . aerodynamic drag  
 . . . . supersonic drag  
 . . . . viscous drag  
 RT minimum drag  
pressure drag  
riblets  
satellite drag  
surface roughness effects  
wave drag

**friction factor**  
 UF *friction loss coefficient*  
 RT coefficient of friction  
pressure gradients  
skin friction

*friction loss coefficient*  
 USE **friction factor**

**friction measurement**  
 UF *tribometry*  
 GS mechanical measurement  
 . **friction measurement**  
 RT elasto-hydrodynamics  
kinetic friction  
 ∞ measurement  
static friction  
tribometers

*friction pressure drop*  
 USE **skin friction**

**friction reduction**  
 RT antifriction bearings  
coefficient of friction  
lubrication  
 ∞ reduction  
streamlining

**friction stir welding**  
*(added August 2002)*  
 DEF Solid state welding technique where a frictionally heated metal seam is stirred by a rotating pin tool to create a bond. The process involves no melting and the weld occurs via extreme plastic deformation associated with frictional straining.  
 UF *FSW (welding)*  
 GS welding  
 . pressure welding  
 . . friction welding  
 . . . **friction stir welding**  
 RT aluminum alloys  
plastic deformation  
stirring  
welded joints

**friction welding**  
 GS welding  
 . pressure welding  
 . . **friction welding**  
 . . . friction stir welding

**frictionless environments**  
 GS environments  
 . **frictionless environments**  
 RT deep space  
levitation

**Friedel-Craft reaction**  
 GS chemical reactions  
 . **Friedel-Craft reaction**  
 RT acylation  
alkylation

**Friendship 7**  
 GS manned spacecraft  
 . Mercury spacecraft  
 . . **Friendship 7**  
 . . reentry vehicles  
 . . recoverable spacecraft  
 . . Mercury spacecraft  
 . . . **Friendship 7**  
 . . soft landing spacecraft  
 . . Mercury spacecraft  
 . . **Friendship 7**  
 . . space capsules  
 . . Mercury spacecraft  
 . . **Friendship 7**

RT Mercury MA-6 flight

**fringe multiplication**  
 DEF The duplicating effect of a family of curves superimposed on another family of curves so that the curves intersect at angles less than 45 degrees. A new family of curves appears which pass through intersections of the original curves.  
 RT diffraction patterns  
interference grating  
Moire effects  
Moire fringes  
multiplication  
photoelastic analysis  
stress analysis  
stress concentration

*fringe patterns*  
 USE **diffraction patterns**

**frit**  
 DEF A powdered ceramic prepared by fusing a physical mixture of oxides into a uniform melt, which is then quenched and milled into a fine, homogeneous powder.  
 RT ceramics  
fusion (melting)  
glazes  
vitreous materials

**frogs**  
 GS animals  
 . vertebrates  
 . . amphibia  
 . . . frogs

*frontal areas (meteorology)*  
 USE **fronts (meteorology)**

**frontal waves**  
 RT ocean currents  
oceanography  
tsunami waves  
water waves  
 ∞ waves

∞ **fronts**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 RT cold fronts  
fronts (meteorology)  
shock fronts  
warm fronts  
wave fronts

**fronts (meteorology)**  
 DEF The contacts at the Earth's surface between two different air masses commonly cold and warm, that generally move in an easterly direction. Used for frontal areas (meteorology) and weather fronts.  
 UF *frontal areas (meteorology)*  
*weather fronts*  
 GS **fronts (meteorology)**  
 . cold fronts  
 . warm fronts  
 RT air masses  
arc clouds  
 ∞ fronts  
intertropical convergent zones  
marine meteorology  
meteorological parameters  
meteorology  
storms  
synoptic meteorology  
thunderstorms  
tornadoes

**frost**  
 RT bay ice  
dew  
freezing  
ice  
low temperature

**frost damage**  
 GS damage  
 . **frost damage**  
 RT cold weather

## frostbite

- ∞ crops
- farm crops
- fruits
- low temperature orchards
- plants (botany)

### frostbite

- GS injuries
- . **frostbite**
- RT cold tolerance

### Froude number

DEF The nondimensional ratio of the inertial force to the force of gravity for a given fluid flow; the reciprocal of the Reech number.

- GS dimensionless numbers
- . **Froude number**
- ratios
- . **Froude number**
- RT fluid flow
- inertia
- kinetic energy
- potential energy
- Reynolds number
- Strouhal number

### frozen equilibrium flow

- GS fluid flow
- . gas flow
- . . equilibrium flow
- . . . **frozen equilibrium flow**
- RT shifting equilibrium flow

### frozen foods

- RT ∞ food
- food processing
- freeze drying
- preserving
- refrigerating

### frozen soils

- USE **permafrost**

### fruits

- GS farm crops
- . **fruits**
- RT agriculture
- bollworms
- botany
- ∞ food
- frost damage
- orchards

### frustration

- RT disabilities
- emotional factors
- emotions
- ∞ inhibition
- lethargy
- psychological effects
- psychology

### frustums

- RT cones
- geometry
- pyramids
- volume

### FSOI (integrated optics)

(added June 1998)

- USE **free-space optical interconnects**

### FSW (welding)

(added August 2002)

- USE **friction stir welding**

### fuel capsules

- RT ∞ capsules
- nuclear fuels
- pellets
- spent fuels

### fuel cell catalysts

- USE **electrocatalysts**

### fuel cell power plants

DEF Power generating devices that directly produce electrical energy from chemical energy and consist of fuel processors, stacked fuel cells, and dc to ac converters. The main types,

distinguished by electrolytes which are heated to different temperatures, are base, phosphoric acid, molten carbonate, and solid oxide.

- GS electric power plants
- . **fuel cell power plants**
- RT coal gasification
- energy technology
- fuel cells

### fuel cells

SN (EXCLUDES BATTERIES)

DEF Devices which convert chemical energy directly into electrical energy but differing from a storage battery in that the reacting chemicals are supplied continuously as needed to meet output requirements.

- GS electric generators
- . direct power generators
- . . **fuel cells**
- . . . biochemical fuel cells
- . . . hydrogen oxygen fuel cells
- . . . molten carbonate fuel cells
- . . . phosphoric acid fuel cells
- . . . regenerative fuel cells
- . . . solid oxide fuel cells
- electrochemical cells
- . **fuel cells**
- . . biochemical fuel cells
- . . hydrogen oxygen fuel cells
- . . molten carbonate fuel cells
- . . phosphoric acid fuel cells
- . . regenerative fuel cells
- . . solid oxide fuel cells

RT ∞ cells

- chemical auxiliary power units
- ∞ electric cells
- electrocatalysts
- electrochemistry
- electrolytes
- energy conversion efficiency
- energy storage
- fuel cell power plants
- hydrogen fuels
- hydrogen-based energy
- ion exchange membrane electrolytes
- magnetohydrodynamic generators
- solar cells
- solar generators
- thermionic converters
- thermoelectric generators
- wet cells

### fuel combustion

- GS combustion
- . **fuel combustion**
- . . nuclear fuel burnup
- RT combustion efficiency
- combustion stability
- erosive burning
- hydrocarbon combustion
- hypersonic combustion
- ignition
- metal combustion
- oxidation
- propellant combustion
- solid propellant combustion
- spontaneous combustion
- supersonic combustion
- turbulent combustion

### fuel conservation

- USE **fuel consumption**

### fuel consumption

DEF The using of fuel by an engine or power plant; the rate of this consumption, measured, e.g., in gallons or pounds per minute.

- UF *fuel conservation*
- GS consumption
- . **fuel consumption**
- RT burning rate
- combustion efficiency
- energy consumption
- energy requirements
- engines
- internal combustion engines
- propellant consumption

refueling

### fuel contamination

- GS contamination
- . **fuel contamination**
- RT antiicing additives
- contaminants
- refueling

### fuel control

- RT combustion control
- ∞ control
- engine control
- fluid management
- liquid sloshing
- propellant transfer
- refueling
- rocket engine control
- turbojet engine control

### fuel corrosion

- GS corrosion
- . **fuel corrosion**
- RT propellant decomposition
- propellant storability

### fuel elements (nuclear reactors)

- USE **nuclear fuel elements**

### fuel flow

- GS fluid flow
- . **fuel flow**
- . . propellant transfer
- RT combustible flow
- ducted flow
- particle laden jets
- reacting flow

### fuel flow regulators

- GS control equipment
- . regulators
- . . flow regulators
- . . . **fuel flow regulators**

### fuel gages

- GS measuring instruments
- . **fuel gages**
- . . capacitive fuel gages
- RT flowmeters

### fuel injection

- UF *injection carburetors*
- GS injection
- . **fuel injection**
- RT burners
- carburetors
- fluid injection
- gas injection
- injectors
- internal combustion engines
- jet engines
- jet mixing flow
- ∞ jet nozzles
- liquid injection
- piston engines
- propellant sprays
- spray nozzles

### fuel oils

- GS fuels
- . chemical fuels
- . . liquid fuels
- . . . **fuel oils**
- oils
- . **fuel oils**
- RT energy policy
- kerogen
- kerosene
- shale oil
- solvent refined coal

### fuel production

- DEF Producing of conventional and/or alternative fuels by various technologies.
- GS **fuel production**
- . hydrocarbon fuel production
- chemical fuels
- RT composite propellants
- crude oil
- fission

- ∞ fusion
  - hydrocarbon fuels
  - hydrogen fuels
  - in situ resource utilization
  - liquid fuels
  - nuclear fuels
- ∞ production
  - synthesis gas
- fuel pumps**
  - GS pumps
    - . **fuel pumps**
  - RT aircraft fuel systems
    - axial flow pumps
    - centrifugal pumps
    - electromagnetic pumps
    - internal combustion engines
    - jet engines
    - jet pumps
    - materials handling
    - turbine pumps
- fuel sprays**
  - RT liquid injection
    - propellant sprays
    - sprayers
- fuel systems**
  - GS **fuel systems**
    - . aircraft fuel systems
  - RT accumulators
    - automobiles
    - bunkers (fuel)
    - carburetors
    - chokes (fuel systems)
    - engines
    - feeders
    - fuels
    - injectors
    - inlet temperature
    - intake systems
    - internal combustion engines
    - manifolds
    - plenum chambers
    - propellant transfer
    - refueling
    - self sealing
    - spray nozzles
  - ∞ systems
- fuel tank pressurization**
  - GS pressurizing
    - . **fuel tank pressurization**
  - RT aircraft fuel systems
    - exhaust systems
    - expulsion bladders
    - liquid rocket propellants
    - pressure
    - pressure regulators
    - pressure vessels
    - propellant storage
    - propellant tanks
    - propulsion
    - relief valves
    - ullage
    - vapor pressure
- fuel tanks**
  - GS tanks (containers)
    - . **fuel tanks**
    - . . wing tanks
  - RT aircraft fuel systems
  - ∞ containers
    - corrosion prevention
    - cryogenic fluid storage
    - cylindrical tanks
    - expulsion bladders
    - external tanks
    - feed systems
    - fuels
    - heating equipment
    - liquid sloshing
    - Pods (external stores)
    - pressure vessels
    - propellant storage
    - propellant tanks
    - propellants
    - propulsion
    - protuberances
    - spacecraft structures
- spherical tanks
- storage tanks
- tanker aircraft
- ullage
- fuel tests**
  - GS **fuel tests**
    - . reactor startup tests
  - RT chemical analysis
    - corrosion tests
    - engine tests
  - ∞ materials tests
    - missile tests
    - propellant tests
    - stability tests
    - test firing
  - ∞ tests
- fuel valves**
  - GS valves
    - . **fuel valves**
  - RT aircraft fuel systems
    - gas valves
    - relief valves
- fuel-air ratio**
  - GS ratios
    - . **fuel-air ratio**
  - RT burning rate
    - combustion efficiency
    - compression ratio
    - gas mixtures
    - ignition limits
    - premixing
    - pressure ratio
    - volumetric efficiency
- fueling*
- USE **refueling**
- fuels**
  - GS **fuels**
    - . chemical fuels
    - . . endothermic fuels
    - . . high energy fuels
    - . . hydrocarbon fuels
    - . . . diesel fuels
    - . . . fossil fuels
    - . . . . coal
    - . . . . anthracite
    - . . . . lignite
    - . . . . solvent refined coal
    - . . . . crude oil
    - . . . . natural gas
    - . . . . liquefied natural gas
    - . . . . peat
    - . . . . shale oil
    - . . . gasoline
    - . . . jet engine fuels
    - . . . . JP-4 jet fuel
    - . . . . JP-5 jet fuel
    - . . . . JP-6 jet fuel
    - . . . . JP-7 jet fuel
    - . . . . JP-8 jet fuel
    - . . . synthane
    - . . liquid fuels
    - . . . antimisting fuels
    - . . . diesel fuels
    - . . . gasoline
    - . . . hydrogen fuels
    - . . . jet engine fuels
    - . . . . JP-4 jet fuel
    - . . . . JP-5 jet fuel
    - . . . . JP-6 jet fuel
    - . . . . JP-7 jet fuel
    - . . . . JP-8 jet fuel
    - . . . fuel oils
    - . . . kerosene
    - . . metal fuels
    - . . synthetic fuels
    - . . . gasohol (fuel)
    - . . . synthane
    - . . clean fuels
    - . . coke
    - . . gaseous fuels
    - . . natural gas
    - . . . liquefied natural gas
    - . . nuclear fuels
    - . . ceramic nuclear fuels
    - . . fissile fuels
- . . fissium
- . . spent fuels
- . aircraft fuels
- . automobile fuels
- RT bioconversion
  - burning rate
  - charcoal
  - energy policy
  - energy storage
  - flames
  - fuel systems
  - fuel tanks
  - hydrogen
  - hydrogen production
  - kerogen
  - liquid ammonia
  - liquid hydrogen
  - nuclear fuel elements
  - oils
  - oxidizers
  - premixing
  - propellants
  - rocket propellants
  - shale oil
  - transportation energy
- Fujita method**
  - RT coordinates
  - ∞ methodology
  - tornadoes
  - ∞ transformations
  - transformations (mathematics)
  - wind velocity
- full scale tests**
  - RT altitude tests
  - engine tests
  - flight tests
  - ground tests
  - high altitude tests
  - ∞ tests
- fullerenes**
  - (added August 1991)
  - DEF Molecules whose structure is similar to the shape of a soccer ball (polyhedron). The geodesic-dome-like molecular structure causes these molecules to be named after Buckminster Fuller, hence, 'fullerene.'
  - GS **fullerenes**
    - . buckminsterfullerene
  - RT atomic clusters
    - carbon
    - carbon nanotubes
    - fullerides
    - graphene
    - graphite
    - molecular clusters
    - nanoparticles
    - nanostucture growth
    - nanotubes
    - polyatomic molecules
    - polyhedrons
- fullerides**
  - (added February 1998)
  - GS carbon compounds
    - . **fullerides**
  - RT ∞ alkali metal compounds
  - ∞ chemical compounds
  - doped crystals
  - fullerenes
  - superconductors (materials)
- fulminates**
  - GS esters
    - . isocyanates
    - . . **fulminates**
    - nitrogen compounds
    - . cyano compounds
    - . . isocyanates
    - . . . **fulminates**
  - RT detonators
    - explosives
    - propellants
- fumes**
  - RT aerosols
  - dispersions
  - dust



## fumigation

- exhaust gases
- fire damage
- gas mixtures
- gases
- haze detection
- reaction products
- smoke
- smoke detectors
- vapors
- wastes

### fumigation

- RT antiseptics
- bactericides
- spraying
- sterilization

### function generators

- GS signal generators
- . **function generators**
- RT  $\infty$  generators
- pulse generators
- voltage generators
- wave generation

### function space

- GS analysis (mathematics)
- . **function space**
- . . . Banach space
- . . . Hilbert space
- . . . . Sobolev space
- RT fibers (mathematics)
- field theory (physics)
- functions (mathematics)
- orthogonal functions
- quantum mechanics
- series (mathematics)
- $\infty$  space
- statistical mechanics
- vectors (mathematics)

### functional analysis

- GS analysis (mathematics)
- . **functional analysis**
- . . . Banach space
- . . . Hilbert space
- . . . . Sobolev space
- . . . convolution integrals
- . . . harmonic analysis
- . . . tesseral harmonics
- . . . zonal harmonics
- . . . integral equations
- . . . . Fredholm equations
- . . . . J integral
- . . . . singular integral equations
- . . . . Volterra equations
- . . . . Wiener Hopf equations
- . . . . integral transformations
- . . . . Fourier transformation
- . . . . . fast Fourier transformations
- . . . . Fourier-Bessel transformations
- . . . . Hilbert transformation
- . . . . Laplace transformation
- RT complex variables
- form factors
- functions (mathematics)
- series (mathematics)
- Walsh function

### functional design specifications

DEF Those levels of design in which all subtasks are specified and their relationships defined so that the total collection of subsystems will perform the intended task of the entire system.

- GS specifications
- . **functional design specifications**
- RT aeronautical engineering
- $\infty$  design
- equipment specifications
- missile design
- product development
- systems engineering

### functional integration

- GS analysis (mathematics)
- . real variables
- . . . measure and integration
- . . . . **functional integration**
- RT analog computers

- differential equations
- digital integrators
- partial differential equations

### functionally gradient materials

(added September 1992)

DEF Composite materials that consist of a gradual compositional variation from ceramic to metal from one surface to the other. These continuous changes result in property gradients which can be adjusted by controlling the composition. Used for FGM (materials).

- UF *FGM (materials)*
- GS composite materials
- . **functionally gradient materials**
- RT aircraft construction materials
- airframe materials
- anisotropic media
- bimetals
- ceramic matrix composites
- combustion synthesis
- composite structures
- fiber composites
- matrix materials
- metal matrix composites
- prepregs
- spacecraft construction materials

### functionals

- RT  $\infty$  functions
- functions (mathematics)
- integrals

### $\infty$ functions

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT contralateral functions
- functionals
- functions (mathematics)
- muscular function
- parenteral functions
- penalty function
- pulmonary functions
- renal function
- scattering functions
- work functions

### functions (mathematics)

- GS **functions (mathematics)**
- . Abel function
- . Airy function
- . analytic functions
- . . . entire functions
- . aperiodic functions
- . asymptotes
- . Boolean functions
- . composite functions
- . conformal mapping
- . coordinate transformations
- . delta function
- . discrete functions
- . discriminant analysis (statistics)
- . distribution functions
- . . . probability distribution functions
- . disturbing functions
- . error functions
- . Fourier transformation
- . . . fast Fourier transformations
- . Fourier-Bessel transformations
- . Fresnel integrals
- . gamma function
- . Green's functions
- . Hamiltonian functions
- . Hankel functions
- . harmonic functions
- . hyperbolic functions
- . hypergeometric functions
- . kernel functions
- . Lagrangian function
- . Laguerre functions
- . Lamé functions
- . Laplace transformation
- . Legendre functions
- . Liapunov functions
- . linear transformations
- . Lorentz transformations
- . Mathieu function
- . Maxwell-Boltzmann density function
- . Mellin transforms

- . meromorphic functions
- . . . elliptic functions
- . . . rational functions
- . monotone functions
- . orthogonal functions
- . . . Walsh function
- . orthonormal functions
- . penalty function
- . point spread functions
- . Poisson density functions
- . probability density functions
- . . . normal density functions
- . . . Pearson distributions
- . . . Rayleigh distribution
- . . . Weibull density functions
- . ramp functions
- . recursive functions
- . Schwarz-Christoffel transformation
- . shape functions
- . space-time functions
- . spherical harmonics
- . spline functions
- . step functions
- . stress functions
- . time functions
- . transcendental functions
- . . . exponential functions
- . . . . logarithms
- . . . periodic functions
- . . . . trigonometric functions
- . . . . . cosine series
- . . . . . sine series
- . . . . . tangents
- . transfer functions
- . . . loop transfer functions
- . . . modulation transfer function
- . . . optical transfer function
- . membership functions
- . weighting functions
- . Whittaker functions

### RT

- algebra
- $\infty$  applications of mathematics
- branching (mathematics)
- calculus
- continuity (mathematics)
- divergence
- extremum values
- function space
- functional analysis
- functionals
- $\infty$  functions
- infinity
- inflection points
- linearity
- mapping
- mathematical logic
- mathematical models
- $\infty$  mathematics
- nonlinearity
- number theory
- numerical differentiation
- operations research
- operators (mathematics)
- random variables
- range (extremes)
- $\infty$  transformations
- transformations (mathematics)
- wavelet analysis

### fungal diseases

- SN (EXCLUDES PLANT DISEASES)
- GS diseases
- . infectious diseases
- . . **fungal diseases**
- RT dermatitis
- fungi
- respiratory diseases

### fungi

- GS plants (botany)
- . **fungi**
- . . Aspergillus
- . . Coccomyces
- . . gibberellins
- . . neurospora
- . . rhizopus
- . . rust fungi
- . . saccharomyces
- . . yeast
- RT blight

- fungus diseases
    - lichens
    - microspores
    - mitra
    - ∞ mold
    - panspermia
    - plant diseases
    - spores
    - thermophiles
  - fungicides**
    - GS **fungicides**
      - . xanthenes
      - . . . caffeine
      - . . . guanines
      - . . . uric acid
    - RT antiinfectives and antibacterials
    - toxicology
  - funnels**
    - RT conical inlets
    - ∞ nozzles
  - furan resins**
    - GS plastics
      - . synthetic resins
      - . . . thermosetting resins
      - . . . **furan resins**
        - . . . . polyamide resins
        - . . . . . Kevlar (trademark)
        - . . . . . Nylon (trademark)
      - resins
        - . synthetic resins
        - . . . thermosetting resins
        - . . . **furan resins**
          - . . . . polyamide resins
          - . . . . . Kevlar (trademark)
          - . . . . . Nylon (trademark)
    - RT adhesives
    - coatings
  - furans**
    - DEF Organic heterocyclic compounds containing diunsaturated rings of four carbon atoms and one oxygen atom; also known as furfuran or tetrol.
    - GS organic compounds
      - . cyclic compounds
      - . . heterocyclic compounds
      - . . . **furans**
        - . . . . tetrahydrofuran
    - RT ∞ chemical compounds
      - plastics
      - solvents
      - thiophenes
  - furfuryl alcohol**
    - RT aldehydes
    - ∞ aromatic compounds
  - furlable antennas**
    - GS antennas
      - . **furlable antennas**
    - RT communication equipment
    - folding structures
    - satellite antennas
    - space communication
    - spacecraft antennas
  - furnaces**
    - SN (EXCLUDES DOMESTIC HEATING EQUIPMENT)
    - GS heating equipment
      - . **furnaces**
        - . . electric furnaces
        - . . image furnaces
        - . . solar furnaces
        - . . vacuum furnaces
    - RT boilers
    - burners
    - chemical engineering
    - chemical reactors
    - chimneys
    - combustion chambers
    - controlled atmospheres
    - ∞ cupolas
    - drying apparatus
    - extraction
    - fluidized bed processors
    - foundries
  - hearths
  - heat treatment
  - incinerators
  - induction heating
  - mechanical engineering
  - melting
  - ∞ metallurgy
  - mufflers
  - ovens
  - refractories
  - separators
  - sintering
  - waste energy utilization
- FUSE (satellite)*  
(added November 2000)  
USE **Far UV Spectroscopic Explorer**
- fuselage mounting*  
USE **aircraft production**
- fuselages**
  - GS aircraft structures
    - . **fuselages**
  - RT aircraft construction materials
  - aircraft parts
  - airframes
  - bays (structural units)
  - body-wing and tail configurations
  - camber
  - centerbodies
  - cockpits
  - cylindrical bodies
  - hulls (structures)
  - wing-fuselage stores
- fuselage-wing stores*  
(added August 1998)  
USE **wing-fuselage stores**
- ∞ **fuses**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT circuit breakers
  - circuit protection
  - electric fuses
  - fuses (ordnance)
  - warheads
- fuses (ordnance)**
  - RT ammunition
  - caps (explosives)
  - detonators
  - ∞ fuses
  - initiators (explosives)
  - warheads
  - wicks
- fusibility**
  - GS thermodynamic properties
    - . thermophysical properties
    - . . **fusibility**
  - RT ∞ physical properties
    - ∞ resistance
    - welding
- fusiform shapes*  
USE **cones**
- ∞ **fusion**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF The combining of atoms and consequent release of energy.
  - RT fuel production
  - inertial fusion (reactor)
  - laser fusion
  - liquid-solid interfaces
  - nuclear fusion
- fusion (melting)**
  - GS phase transformations
    - . melting
    - . . **fusion (melting)**
  - RT adhesion
    - frit
    - fusion welding
    - heat of fusion
  - ∞ joining
- phase change materials
- fusion heat*  
USE **heat of fusion**
- fusion propulsion**  
(added September 1999)  
GS propulsion
  - . nuclear propulsion
  - . . **fusion propulsion**
- RT inertial confinement fusion
- nuclear electric propulsion
- nuclear fusion
- nuclear rocket engines
- plasma propulsion
- spacecraft propulsion
- fusion reactors**
  - GS nuclear reactors
    - . **fusion reactors**
      - . . heliotrons
      - . . spheromaks
      - . . stellarators
  - RT beta factor
  - blankets (fusion reactors)
  - bumpy toruses
  - fusion-fission hybrid reactors
  - impact fusion
  - inertial fusion (reactor)
  - limiters (fusion reactors)
  - mirror fusion
  - nuclear fission
  - nuclear fusion
  - Q values (nuclear physics)
  - ∞ reactors
    - tandem mirrors
    - thermal barriers (plasma control)
- fusion weapons**
  - UF *hydrogen bombs*
  - GS weapons
    - . nuclear weapons
    - . . **fusion weapons**
  - RT laser weapons
  - nuclear fusion
- fusion welding**
  - GS welding
    - . **fusion welding**
      - . . electric welding
        - . . . arc welding
          - . . . . gas tungsten arc welding
          - . . . . plasma arc welding
        - . . . electroslag welding
      - . . flash welding
      - . . electron beam welding
      - . . gas welding
        - . . . brazing
          - . . . . low temperature brazing
        - . . laser welding
  - RT fusion (melting)
  - pressure welding
  - spot welds
- fusion-fission hybrid reactors**
  - GS nuclear reactors
    - . **fusion-fission hybrid reactors**
  - RT fusion reactors
  - nuclear fission
  - nuclear fusion
  - ∞ reactors
- fuzzy sets**
  - DEF Mathematical models coupled with a provision for the effect of human factors and construction process and experience.
  - RT algorithms
  - fuzzy systems
  - membership functions
  - set theory
- fuzzy systems**
  - DEF Systems that involve fuzzy sets.
  - RT algorithms
  - fuzzy sets
  - membership functions
  - multisensor fusion
  - probability theory
  - set theory
  - system identification

## FV-12A aircraft

∞ systems  
systems analysis  
uncertain systems

### FV-12A aircraft

GS attack aircraft  
. fighter aircraft  
. . FV-12A aircraft

V/STOL aircraft

. FV-12A aircraft

RT ∞ aircraft

∞ military aircraft

*FW-H equation*

*(added January 2007)*

USE **Fowcs Williams-Hawkings**  
equation

# G

- G force*  
USE **acceleration (physics)**
- G stars**  
GS celestial bodies  
  . stars  
  . . . **G stars**  
  . . . sun  
RT dwarf stars  
F stars  
giant stars  
main sequence stars  
stellar spectra
- G-1 aircraft**  
UF *Navion G-1 aircraft*  
*Navion Rangemaster aircraft*  
*Rangemaster aircraft*  
GS general aviation aircraft  
  . **G-1 aircraft**  
  light aircraft  
  . **G-1 aircraft**  
  monoplanes  
  . **G-1 aircraft**  
  Navion aircraft  
  . **G-1 aircraft**  
  passenger aircraft  
  . **G-1 aircraft**  
  transport aircraft  
  . **G-1 aircraft**  
RT ∞ aircraft
- G-91 aircraft**  
UF *Fiat G-91 aircraft*  
GS attack aircraft  
  . fighter aircraft  
  . . . **G-91 aircraft**  
  *Fiat aircraft*  
  . **G-91 aircraft**  
  jet aircraft  
  . **G-91 aircraft**  
  monoplanes  
  . **G-91 aircraft**  
RT ∞ aircraft
- G-95/4 aircraft**  
UF *Fiat G-95/4 aircraft*  
GS attack aircraft  
  . fighter aircraft  
  . . . **G-95/4 aircraft**  
  *Fiat aircraft*  
  . **G-95/4 aircraft**  
  jet aircraft  
  . **G-95/4 aircraft**  
  monoplanes  
  . **G-95/4 aircraft**  
  supersonic aircraft  
  . **G-95/4 aircraft**  
  V/STOL aircraft  
  . **G-95/4 aircraft**  
RT ∞ aircraft
- G-222 aircraft**  
UF *Fiat G-222 aircraft*  
GS *Fiat aircraft*  
  . **G-222 aircraft**  
  jet aircraft  
  . turboprop aircraft  
  . . . **G-222 aircraft**  
  monoplanes  
  . **G-222 aircraft**  
  passenger aircraft  
  . **G-222 aircraft**  
  transport aircraft  
  . **G-222 aircraft**  
  V/STOL aircraft  
  . **G-222 aircraft**  
RT ∞ aircraft
- GA-5 aircraft**  
UF *Gloster GA-5 aircraft*  
*Javelin aircraft*  
GS attack aircraft  
  . fighter aircraft  
  . . . **GA-5 aircraft**  
  Hawker Siddeley aircraft  
  . **GA-5 aircraft**  
  jet aircraft  
  . **GA-5 aircraft**
- monoplanes  
  . **GA-5 aircraft**  
RT ∞ aircraft
- gabbro**  
GS rocks  
  . igneous rocks  
  . . . **gabbro**  
RT anorthosite  
  lunar rocks
- Gabon**  
GS nations  
  . **Gabon**  
RT Africa
- Gabor filters**  
(added February 1998)  
GS image filters  
  . **Gabor filters**  
RT computer vision  
  ∞ filters  
  Gabor transformation  
  image analysis  
  image processing  
  low pass filters  
  neural nets  
  spatial filtering  
  textures
- Gabor transformation**  
(added February 1998)  
GS transformations (mathematics)  
  . **Gabor transformation**  
RT Fourier transformation  
  Gabor filters  
  holography  
  image processing  
  signal analysis  
  wavelet analysis
- gadolinium**  
GS chemical elements  
  . rare earth elements  
  . . . **gadolinium**  
  . . . gadolinium isotopes  
  metals  
  . rare earth elements  
  . . . **gadolinium**  
  . . . gadolinium isotopes  
RT gadolinium-gallium garnet
- gadolinium alloys**  
DEF Mixtures of gadolinium, a rare earth metal, with other metals.  
GS alloys  
  . rare earth alloys  
  . . . **gadolinium alloys**  
RT metals
- gadolinium isotopes**  
GS chemical elements  
  . nuclides  
  . isotopes  
  . . . **gadolinium isotopes**  
  . rare earth elements  
  . . . gadolinium  
  . . . **gadolinium isotopes**  
  metals  
  . rare earth elements  
  . . . gadolinium  
  . . . **gadolinium isotopes**
- gadolinium-gallium garnet**  
(added August 1990)  
DEF A semiconducting crystalline compound used primarily as a solid-state laser material.  
UF *GGG (garnet)*  
GS gallium compounds  
  . **gadolinium-gallium garnet**  
  minerals  
  . garnets  
  . . . **gadolinium-gallium garnet**  
  silicon compounds  
  . silicates  
  . . . garnets  
  . . . **gadolinium-gallium garnet**
- RT doped crystals  
ecolite  
ferrites  
gadolinium  
laser materials  
lasers  
magnetostatic amplifiers  
semiconductor lasers  
semiconductors (materials)
- gages*  
USE **measuring instruments**
- Gaia hypothesis**  
(added June 1990)  
DEF The hypothesis that the Earth's atmosphere, biosphere, and its living organisms behave as a single system striving to maintain a stability conducive to the existence of life.  
RT atmospheric composition  
  atmospheric temperature  
  biochemistry  
  biological evolution  
  biosphere  
  ecology  
  ecosystems  
  greenhouse effect
- gain (amplification)*  
USE **amplification**
- gait**  
(added September 2001)  
DEF The pace or manner in which a legged animal or robot moves from one place to another.  
GS locomotion  
  . **gait**  
RT leg (anatomy)  
  robot dynamics  
  running  
  walking  
  walking machines
- galactic bulge**  
(added August 1988)  
UF *central bulge (galaxies)*  
*nuclear bulge (galaxies)*  
RT galactic nuclei  
  galactic structure  
  galaxies  
  Milky Way Galaxy  
  spiral galaxies  
  x ray sources
- galactic clusters**  
SN (RESTRICTED TO CLUSTERS OF GALAXIES; EXCLUDES OPEN CLUSTERS)  
UF *galaxy groups*  
GS celestial bodies  
  . **galactic clusters**  
  . . . local group (astronomy)  
  . . . Virgo galactic cluster  
RT agglomeration  
  ∞ clusters  
  cooling flows (astrophysics)  
  disk galaxies  
  elliptical galaxies  
  large-scale structure of the universe  
  metallicity  
  missing mass (astrophysics)  
  protogalaxies  
  star clusters  
  star distribution  
  stellar systems  
  Sunyaev-Zeldovich effect
- galactic cosmic rays**  
DEF Energetic particles that come from outside the solar systems. They generally come from within our galaxy.  
GS extraterrestrial radiation  
  . galactic radiation  
  . . . **galactic cosmic rays**  
  ionizing radiation  
  . cosmic rays  
  . . . **galactic cosmic rays**  
RT Advanced Composition Explorer

## galactic evolution

energetic particles  
galactic winds  
solar activity effects  
solar wind

### galactic evolution

UF *galaxy formation*  
GS evolution (development)  
. **galactic evolution**  
RT astrophysics  
big bang cosmology  
cooling flows (astrophysics)  
cosmology  
dark matter  
disk galaxies  
galactic mass  
gravitational instability  
large-scale structure of the universe  
protogalaxies  
ring galaxies  
star distribution  
star formation rate  
stellar evolution  
stellar mass accretion

### galactic halos

(added December 1992)

DEF The tenuous, spherical cloud surrounding spiral galaxies. It is the locus of old stars and globular clusters. Halos appear to be required, at least to some extent, for the stability of disk galaxies.

RT dark matter  
disk galaxies  
galactic structure  
globular clusters  
halos  
intergalactic media  
interstellar gas  
massive compact halo objects  
missing mass (astrophysics)  
molecular clouds  
Population II stars  
spiral galaxies  
star distribution

### galactic magnetic fields

USE **interstellar magnetic fields**

### galactic mass

DEF The total amount of matter contained in a galaxy.

GS mass  
. **galactic mass**  
RT galactic evolution  
galactic structure  
mass distribution  
stellar mass

### galactic nuclei

GS **galactic nuclei**  
. active galactic nuclei  
RT absorption spectra  
accretion disks  
active galaxies  
disk galaxies  
galactic bulge  
radio jets (astronomy)  
radio sources (astronomy)  
Seyfert galaxies  
starburst galaxies

### galactic radiation

GS extraterrestrial radiation  
. **galactic radiation**  
. . galactic cosmic rays  
. . galactic radio waves  
. . . North Polar Spur (astronomy)  
. . galactic winds  
RT active galactic nuclei  
active galaxies  
brightness distribution  
corpuscular radiation  
cosmic noise  
cosmic rays  
cosmic x rays  
electromagnetic radiation  
gamma ray astronomy  
gamma ray bursts  
gamma ray sources (astronomy)

Hubble diagram  
infrared cirrus (astronomy)  
interstellar radiation  
irregular galaxies  
mass to light ratios  
nonthermal radiation  
 $\infty$  radiation  
radiative transfer  
Solar Radiation 1 satellite  
Solar Radiation 3 satellite  
stellar radiation  
Uhuru satellite

### Galactic Radiation Exp Background sats

USE **GREB satellites**

### galactic radio waves

DEF Radio waves emanating from our galaxy.  
GS electromagnetic radiation  
. radio waves  
. . extraterrestrial radio waves  
. . . **galactic radio waves**  
. . . . North Polar Spur (astronomy)  
extraterrestrial radiation  
. extraterrestrial radio waves  
. . **galactic radio waves**  
. . . North Polar Spur (astronomy)  
. galactic radiation  
. . **galactic radio waves**  
. . . North Polar Spur (astronomy)  
RT cosmic noise  
radio jets (astronomy)

### galactic rotation

GS gyration  
. rotation  
. . **galactic rotation**  
RT corotation  
disk galaxies  
hydrogen clouds  
irregular galaxies  
stellar motions  
stellar systems  
Tully-Fisher relation  
velocity distribution

### galactic structure

RT barred galaxies  
compact galaxies  
corotation  
density wave model  
disk galaxies  
galactic bulge  
galactic halos  
galactic mass  
galaxies  
interacting galaxies  
irregular galaxies  
missing mass (astrophysics)  
peculiar galaxies  
ring galaxies  
shell galaxies  
stellar systems  
 $\infty$  structures

### galactic winds

(added May 1994)  
GS extraterrestrial radiation  
. galactic radiation  
. . **galactic winds**  
RT galactic cosmic rays  
space plasmas  
stellar winds

### galactose

GS organic compounds  
. carbohydrates  
. . sugars  
. . . monosaccharides  
. . . . hexoses  
. . . . . **galactose**

### Galatea

(added July 1995)

DEF A natural satellite of Saturn, orbiting at a mean distance of 62,000 kilometers.

GS celestial bodies  
. natural satellites  
. . Neptune satellites

. . . **Galatea**  
RT Neptune (planet)

### galaxies

DEF Vast assemblages of stars or nebulae, composing island universes separated from other such assemblages by great distances.

GS celestial bodies  
. **galaxies**  
. . active galaxies  
. . . Markarian galaxies  
. . . radio galaxies  
. . . Seyfert galaxies  
. . compact galaxies  
. . disk galaxies  
. . dwarf galaxies  
. . elliptical galaxies  
. . interacting galaxies  
. . irregular galaxies  
. . Maffei galaxies  
. . Magellanic clouds  
. . peculiar galaxies  
. . ring galaxies  
. . shell galaxies  
. . spiral galaxies  
. . . Andromeda Galaxy  
. . . barred galaxies  
. . . Milky Way Galaxy  
. . protogalaxies  
. . starburst galaxies  
. . Virgo galactic cluster  
RT BL Lacertae objects  
faint objects  
galactic bulge  
galactic structure  
Gum nebula  
Hubble constant  
Hubble diagram  
metallicity  
nebulae  
Orion nebula  
quasars  
radio sources (astronomy)  
red shift  
star clusters  
star formation rate  
stars  
stellar systems

### Galaxy aircraft

USE **C-5 aircraft**

### galaxy formation

(added May 1997)

USE **galactic evolution**

### galaxy groups

USE **galactic clusters**

### galaxy interaction

USE **interacting galaxies**

### Galerkin method

RT linearization  
meshfree methods  
 $\infty$  methodology

### Galilean satellites

DEF The four largest and brightest satellites of Jupiter (Io, Europa, Ganymede, and Callisto).

GS celestial bodies  
. natural satellites  
. . Jupiter satellites  
. . . **Galilean satellites**  
. . . . Callisto  
. . . . Europa  
. . . . Ganymede  
. . . . Io  
RT Charon  
Galileo project  
Galileo spacecraft  
icy satellites  
Jupiter (planet)  
Triton

### Galileo mission

USE **Galileo project**

### Galileo probe

DEF The NASA Jupiter atmospheric entry

probe to be deployed from the Galileo spacecraft. The probe will make in situ measurements while descending from a parachute.

- GS interplanetary spacecraft
  - . Jupiter probes
  - . . . **Galileo probe**
  - unmanned spacecraft
  - . space probes
  - . . . Jupiter probes
  - . . . **Galileo probe**
- RT Jupiter (planet)
  - ∞ probes
  - ∞ spacecraft

#### Galileo project

DEF A NASA program to probe Jupiter, its environment and natural satellites. The spacecraft was placed in Earth orbit by the Space Transportation System (STS) on October 18, 1989. Used for Galileo mission.

- UF *Galileo mission*
- GS programs
  - . NASA programs
  - . . . NASA space programs
  - . . . **Galileo project**
  - . projects
  - . . . **Galileo project**
  - . space programs
  - . . . NASA space programs
  - . . . **Galileo project**
- RT Amphitrite asteroid
  - atmospheric entry
  - flyby missions
  - Galilean satellites
  - Jupiter atmosphere
  - Jupiter probes

#### Galileo spacecraft

DEF A NASA orbiter spacecraft which will carry the Galileo probe and, following deployment at Jupiter, will become an orbiting platform for remote sensing of Jupiter and its satellites.

- GS interplanetary spacecraft
  - . Jupiter probes
  - . . . **Galileo spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . . Jupiter probes
  - . . . **Galileo spacecraft**
- RT flyby missions
  - Galilean satellites
  - Gaspra asteroid
  - Ida asteroid
  - Jupiter (planet)
  - ∞ missions
  - ∞ spacecraft

#### gall

- RT digestive system
  - gastrointestinal system
  - secretions

#### gallamine triethiodide

- GS ethers
  - . **gallamine triethiodide**
  - halogen compounds
  - . iodine compounds
  - . . . iodides
  - . . . **gallamine triethiodide**
  - organic compounds
  - . amines
  - . . . **gallamine triethiodide**

#### gallates

- GS gallium compounds
  - . **gallates**
  - . . . sodium gallates

#### gallium

- GS chemical elements
  - . **gallium**
  - . . . gallium isotopes
  - metals
  - . **gallium**
  - . . . gallium isotopes

#### gallium alloys

- GS alloys
  - . **gallium alloys**
- RT aluminum alloys

indium alloys  
superconductivity

#### gallium antimonides

- GS antimony compounds
  - . antimonides
  - . . . **gallium antimonides**
  - gallium compounds
  - . **gallium antimonides**

#### gallium arsenide lasers

- GS electronic equipment
  - . solid state devices
  - . . . semiconductor devices
  - . . . . . semiconductor lasers
  - . . . . . **gallium arsenide lasers**
  - . . . solid state lasers
  - . . . . . **gallium arsenide lasers**
  - stimulated emission devices
  - . lasers
  - . . semiconductor lasers
  - . . . **gallium arsenide lasers**
  - . . solid state lasers
  - . . . **gallium arsenide lasers**
- RT aluminum gallium arsenide lasers
  - injection lasers
  - stimulated emission
  - waveguide lasers

#### gallium arsenides

- GS arsenic compounds
  - . arsenides
  - . . . **gallium arsenides**
  - . . . . . aluminum gallium arsenides
  - . . . . . indium gallium arsenides
  - gallium compounds
  - . **gallium arsenides**
  - . . aluminum gallium arsenides
  - . . . indium gallium arsenides
- RT antisite defects
  - Bragg reflectors
  - Gunn diodes
  - heterojunction devices
  - injection lasers
  - MODFETS
  - negative conductance
  - negative electron affinity
  - negative resistance devices
  - quantum well infrared photodetectors
  - Schottky diodes
  - semiconductor lasers
  - superlattices
  - transferred electron devices

#### gallium compounds

- GS **gallium compounds**
  - . gadolinium-gallium garnet
  - . gallates
  - . . . sodium gallates
  - . gallium antimonides
  - . gallium arsenides
  - . . . aluminum gallium arsenides
  - . . . indium gallium arsenides
  - . gallium nitrides
  - . gallium oxides
  - . gallium phosphides
  - . gallium selenides
- RT ∞ chemical compounds
  - ∞ Group 3A compounds
  - ∞ metal compounds

#### gallium isotopes

- GS chemical elements
  - . gallium
  - . . . **gallium isotopes**
  - . nuclides
  - . . . isotopes
  - . . . . . **gallium isotopes**
  - metals
  - . gallium
  - . . . **gallium isotopes**

#### gallium nitrides

- GS gallium compounds
  - . **gallium nitrides**
  - nitrogen compounds
  - . nitrides
  - . . metal nitrides
  - . . . **gallium nitrides**

RT semiconductors (materials)

#### gallium oxides

- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **gallium oxides**
  - gallium compounds
  - . **gallium oxides**

#### gallium phosphides

- GS gallium compounds
  - . **gallium phosphides**
  - phosphorus compounds
  - . phosphides
  - . . **gallium phosphides**

#### gallium selenides

- GS chalcogenides
  - . selenides
  - . . **gallium selenides**
  - gallium compounds
  - . **gallium selenides**
  - selenium compounds
  - . selenides
  - . . **gallium selenides**

*galvanic cells*

USE **electrolytic cells**

#### galvanic skin response

- UF *electrodermal response*
- GS responses
  - . **galvanic skin response**
- RT electrical resistance
  - lies

*galvanizing*

USE **zinc coatings**

#### galvanomagnetic effects

- UF *galvanomagnetism*
- GS **galvanomagnetic effects**
  - . Hall effect
  - . Nernst-Ettingshausen effect
  - . . quantum Hall effect
- RT ∞ effects

*galvanomagnetism*

USE **galvanomagnetic effects**

#### galvanometers

- GS measuring instruments
  - . **galvanometers**
- RT ammeters
  - electrometers
  - micromilliammeters
  - millivoltmeters
  - thermocouple pyrometers

#### Gambia

- GS nations
  - . **Gambia**
- RT Africa

#### game theory

DEF Application of mathematics to a game, business situation, or other problem to maximize gain or minimize loss.

- GS **game theory**
  - . saddle points (game theory)
- RT decision theory
  - deployment
  - games
  - information theory
  - linear programming
  - martingales
  - mathematical models
  - mathematical programming
  - minimax technique
  - Monte Carlo method
  - operations research
  - probability theory
  - risk
  - saddle points
  - simulation
  - statistical analysis
  - statistical decision theory
  - stochastic processes
  - strategy
  - ∞ theories

## games

- war games
- games**
  - (added October 1998)
  - GS **games**
    - . differential games
    - . pursuit-evasion games
    - . war games
    - . zero sum games
  - RT control theory
    - game theory
    - optimization
- gametocytes**
  - UF *oocytes*  
*spermatocytes*
  - GS cells (biology)
    - . **gametocytes**
    - . . eggs
    - . . . zygotes
    - . . spermatozoa
  - RT spermatogenesis
- gamma function**
  - GS analysis (mathematics)
    - . complex variables
    - . . **gamma function**
  - RT factorials
    - statistical distributions
- gamma globulin**
  - GS antibodies
    - . **gamma globulin**
  - biopolymers
  - . proteins
  - . . globulins
  - . . . **gamma globulin**
  - organic compounds
  - . proteins
  - . . globulins
  - . . . **gamma globulin**
- gamma radiation*
  - USE **gamma rays**
- gamma ray absorptiometry**
  - GS density measurement
    - . **gamma ray absorptiometry**
  - RT absorption spectra
    - densitometers
    - electromagnetic absorption
    - energy absorption
  - ∞ measurement
    - photon absorptiometry
    - radiation absorption
- gamma ray absorption**
  - GS energy absorption
    - . radiation absorption
    - . . electromagnetic absorption
    - . . . **gamma ray absorption**
  - RT ∞ absorption
    - electromagnetic properties
    - electromagnetic radiation
    - ionizing radiation
    - nuclear radiation
    - photon absorptiometry
- gamma ray astronomy**
  - DEF Astronomy based on the detection of gamma ray emission and interactions from supernova remnants, neutron stars, flare stars, galactic core and disc, black holes, etc.
  - GS astronomy
    - . **gamma ray astronomy**
  - RT astrophysics
    - cosmic x rays
    - energy spectra
    - Fermi Gamma-ray Space Telescope
    - galactic radiation
    - gamma ray bursts
    - gamma ray sources (astronomy)
    - gamma ray telescopes
    - Granat satellite
    - HEAO 4
    - radio astronomy
    - soft gamma repeaters
    - Swift observatory
- x ray astronomy
  - Gamma Ray Astronomy Explorer*
  - USE **Explorer 11 satellite**
- gamma ray beams**
  - GS beams (radiation)
    - . **gamma ray beams**
  - electromagnetic radiation
    - . **gamma ray beams**
  - ionizing radiation
    - . **gamma ray beams**
  - nuclear radiation
    - . **gamma ray beams**
  - RT photon beams
    - radioactive decay
- gamma ray bursts**
  - DEF Short (about 0. 1 - 4 sec.) intense low-energy (about 0. 1 - 1. 2 MeV) bursts recorded by the Vela satellite system in 1967. Their isotropic distribution suggests an extragalactic origin, but a galactic disk origin cannot be ruled out. Used for cosmic gamma ray bursts.
  - UF *cosmic gamma ray bursts*
  - GS bursts
    - . **gamma ray bursts**
  - electromagnetic radiation
    - . gamma rays
    - . . **gamma ray bursts**
  - extraterrestrial radiation
    - . **gamma ray bursts**
  - ionizing radiation
    - . cosmic rays
    - . . **gamma ray bursts**
    - . . gamma rays
    - . . . **gamma ray bursts**
  - nuclear radiation
    - . gamma rays
    - . . **gamma ray bursts**
  - RT big bang cosmology
    - bremsstrahlung
    - Cerenkov radiation
    - cosmic x rays
    - galactic radiation
    - gamma ray astronomy
    - interstellar radiation
    - nuclear particles
    - radiant flux density
    - soft gamma repeaters
    - starquakes
    - stellar radiation
    - Swift observatory
    - x ray astronomy
- gamma ray lasers**
  - DEF Stimulated emission devices producing coherent gamma radiation.
  - GS stimulated emission devices
    - . lasers
    - . . **gamma ray lasers**
  - RT coherent light
    - light transmission
    - optical pumping
    - pulsed radiation
- Gamma Ray Observatory**
  - DEF A late 1980s NASA mission to explore the gamma ray window to the universe from 0. 06 MeV to 30 GeV.
  - UF *Compton Gamma Ray Observatory*
  - GS artificial satellites
    - . scientific satellites
    - . . astronomical satellites
    - . . . **Gamma Ray Observatory**
  - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . **Gamma Ray Observatory**
  - RT gamma ray telescopes
    - OGO
    - spaceborne astronomy
    - spaceborne telescopes
- gamma ray sources (astronomy)**
  - (added October 1997)
  - SN (LIMITED TO ASTRONOMICAL SOURCES; EXCLUDES RADIATION DEVICES)
  - GS **gamma ray sources (astronomy)**
    - . soft gamma repeaters
- RT COS-B satellite
  - galactic radiation
  - gamma ray astronomy
  - pulsars
  - radio sources (astronomy)
  - spectral counterparts (astronomy)
  - Swift observatory
  - x ray sources
- gamma ray spectra**
  - DEF The energy distribution of gamma rays emitted by nuclei.
  - GS spectra
    - . radiation spectra
    - . . electromagnetic spectra
    - . . . **gamma ray spectra**
  - RT emission spectra
    - ionizing radiation
- gamma ray spectrometers**
  - DEF Instruments for deriving the physical constants of materials by using induced gamma radiation as the emission source.
  - GS measuring instruments
    - . spectrometers
    - . . **gamma ray spectrometers**
  - RT 2001 Mars Odyssey
    - anticoincidence detectors
    - optical measurement
    - scintillating fibers
    - Solar Maximum Mission
    - spectra
    - spectrum analysis
- gamma ray telescopes**
  - DEF Special telescopes for the observation (and recording) of astronomical phenomena in the gamma ray spectrum.
  - GS telescopes
    - . **gamma ray telescopes**
    - . . Fermi Gamma-ray Space Telescope
  - RT cosmic rays
    - gamma ray astronomy
    - Gamma Ray Observatory
    - scintillating fibers
    - Swift observatory
- gamma rays**
  - SN (EMITTED BY NUCLEI)
  - DEF Quanta of electromagnetic radiation emitted by nuclei, each such photon being emitted as the result of a quantum transition between two energy levels of the nucleus. Gamma rays have energies usually between 10 thousand electron volts and 10 million electron volts with correspondingly short wavelengths and high frequencies. Used for gamma radiation.
  - UF *gamma radiation*
  - GS electromagnetic radiation
    - . **gamma rays**
    - . . gamma ray bursts
    - . . ionizing radiation
    - . **gamma rays**
    - . . gamma ray bursts
    - . . nuclear radiation
    - . **gamma rays**
    - . . gamma ray bursts
    - . . bremsstrahlung
  - RT cosmic rays
    - decay
    - emission spectra
    - flux (rate)
    - flux density
    - monochromatic radiation
    - Mossbauer effect
    - photomagnetic effects
    - photons
  - ∞ radiation
    - radiation effects
    - radiation shielding
    - radioactive decay
    - radioactivity
  - ∞ rays
    - scintillating fibers
    - transverse oscillation
    - transverse waves
    - Wind/GGS spacecraft

- x rays
- Gamma-ray Large Area Space Telescope*  
(added August 2008)  
USE **Fermi Gamma-ray Space Telescope**
- ganglia**  
GS anatomy  
. nervous system  
. . . nerves  
. . . **ganglia**  
RT cells (biology)  
neuroglia  
neurophysiology
- gantries*  
USE **gantry cranes**
- gantry cranes**  
DEF Large cranes mounted on platforms that usually run back and forth on parallel tracks astride the work area. Used for gantries.  
UF *gantries*  
GS handling equipment  
. cranes  
. . . **gantry cranes**  
RT ground support equipment  
launching pads  
launching sites  
umbilical towers
- Ganymede**  
DEF A satellite of Jupiter orbiting at a mean distance of 1,071,000 kilometers. Also called Jupiter III.  
GS celestial bodies  
. natural satellites  
. . . icy satellites  
. . . **Ganymede**  
. . . Jupiter satellites  
. . . Galilean satellites  
. . . . **Ganymede**  
RT Callisto  
Charon  
Io  
Jupiter (planet)
- GAP (propellants)*  
USE **glycidyl azide polymer**
- gaps**  
GS **gaps**  
. energy gaps (solid state)  
. spark gaps  
RT ∞ arresters  
∞ breakdown  
crack opening displacement  
∞ holes  
openings  
orifices  
passageways  
quantum wells  
∞ tunnels
- gaps (geology)**  
DEF Ravines or gorges cut deeply through a mountain ridge, or between hills or mountains. Used for cols and passes.  
UF *cols*  
*passes*  
GS geology  
. **gaps (geology)**  
landforms  
. **gaps (geology)**  
RT mountains  
∞ ridges
- garbage**  
GS wastes  
. **garbage**  
RT composting  
organic wastes (fuel conversion)  
sewers  
solid wastes  
utilities  
waste disposal  
waste treatment
- garments**  
GS clothing
- . **garments**  
RT flight clothing  
suits  
vests
- garnets**  
DEF Groups of minerals that are silicates of cubic crystalline form.  
GS minerals  
. **garnets**  
. . . gadolinium-gallium garnet  
. . . yttrium-aluminum garnet  
. . . yttrium-iron garnet  
silicon compounds  
. silicates  
. . **garnets**  
. . . gadolinium-gallium garnet  
. . . yttrium-aluminum garnet  
. . . yttrium-iron garnet  
RT eclogite  
lasers
- GARP*  
USE **Global Atmospheric Research Program**
- GARP Atlantic Tropical Experiment**  
UF *GATE (experiment)*  
GS programs  
. Global Atmospheric Research Program  
. . **GARP Atlantic Tropical Experiment**  
RT Atlantic Ocean  
intertropical convergent zones  
meteorology  
NASA programs  
oceanography  
tropical meteorology  
tropical regions  
weather forecasting
- gas analysis**  
GS chemical tests  
. chemical analysis  
. . **gas analysis**  
. . . ozonometry  
. . . Van Slyke method  
RT air sampling  
flame probes  
Hopcalite (trademark)  
mass spectrometers  
∞ materials tests  
oxygen analyzers  
qualitative analysis  
quantitative analysis  
volumetric analysis
- gas atomization**  
DEF Atomization of fluids by high velocity  
gas jets.  
GS atomizing  
. **gas atomization**  
RT aerosols  
collisions  
comminution  
liquid atomization  
particles
- gas bags**  
GS bags  
. **gas bags**  
expandable structures  
. inflatable structures  
. . **gas bags**  
RT balloons  
high altitude balloons
- gas bearings**  
UF *air bearings*  
*gas lubricated bearings*  
GS bearings  
. **gas bearings**  
RT antifriction bearings  
fluid films  
foil bearings  
high temperature lubricants  
squeeze films  
thrust bearings
- turbine engines
- gas chromatography**  
DEF A method of chemical analysis involving the separation of volatile constituents of a mixture by means of gas flow entrainment, vapor pressure differences, and affinity of specific compounds for various liquids or solid materials.  
GS chemical tests  
. chemical analysis  
. . chromatography  
. . . **gas chromatography**  
RT adsorption  
paper chromatography  
sorption  
thin layer chromatography
- gas composition**  
GS composition (property)  
. **gas composition**  
. . carbon dioxide concentration  
RT atmospheric composition  
atom concentration  
chemical composition  
Dalton law  
expired air  
ionospheric composition  
plasma composition  
polar gases
- gas cooled fast reactors**  
GS nuclear reactors  
. fast nuclear reactors  
. . **gas cooled fast reactors**  
. gas cooled reactors  
. . **gas cooled fast reactors**
- gas cooled reactors**  
UF *GCR (reactors)*  
GS nuclear reactors  
. **gas cooled reactors**  
. . experimental gas cooled reactors  
. . gas cooled fast reactors  
. . high temperature nuclear reactors  
. . . high temperature gas cooled reactors  
. . . KIWI reactors  
. . . KIWI B reactors  
. . . . KIWI B-1 Reactor  
. . . . KIWI B-4 Reactor  
. . . Tory 2 reactor  
. . Tory 2-A reactor  
. . Tory 2-C reactor  
RT ∞ gas reactors
- gas cooling**  
SN (COOLING WITH GAS)  
GS cooling  
. **gas cooling**  
RT coolants  
freon  
heat exchangers
- gas density**  
GS density (mass/volume)  
. **gas density**  
RT atom concentration  
buoyancy  
convective flow  
gaseous diffusion  
ideal gas  
probability density functions  
rarefied gases  
real gases
- gas detectors**  
RT detection  
∞ detectors  
haze detection  
identifying  
indicating instruments  
monitors  
∞ probes  
∞ sensors  
smoke detectors



## gas discharge tubes

warning systems

*gas diffusion*

USE **gaseous diffusion**

*gas discharge counters*

USE **counters**  
**gas discharge tubes**

### gas discharge tubes

DEF Evacuated enclosures containing a gas at low pressure that permits the passage of electricity through the gas upon application of sufficient voltage. Note: The tubes are usually provided with metal electrodes, but one form permits an electrodeless discharge with induced voltage. Used for discharge tubes and gas discharge counters.

UF *discharge tubes*  
*gas discharge counters*

GS *electron tubes*  
**gas discharge tubes**  
*ignitrons*  
*thyatron*

RT Faraday dark space

∞ *gas tubes*  
microwave equipment  
microwave oscillators  
microwave tubes  
phototubes  
radiation counters

### gas discharges

GS *electric current*  
*electric discharges*  
*Townsend discharge*  
**gas discharges**  
*toroidal discharge*  
*ring discharge*

RT *afterglows*  
*cold cathode tubes*  
*cold cathodes*  
*electric arcs*  
*electric sparks*  
*electrodeless discharges*  
*electron avalanche*  
*glow discharges*  
*lightning*  
*polar gases*

### gas dissociation

GS *dissociation*  
**gas dissociation**

RT *thermal dissociation*

### gas dynamics

GS *mechanics (physics)*  
*fluid mechanics*  
*fluid dynamics*  
**gas dynamics**  
*aerodynamics*  
*aerothermodynamics*  
*hypersonics*  
*rotor aerodynamics*  
*supersonics*  
*unsteady aerodynamics*  
*interactional aerodynamics*  
*rarefied gas dynamics*

RT *Dalton law*

∞ *dynamics*  
*gas path analysis*  
*gaseous diffusion*  
*gaseous self-diffusion*  
*gases*  
*hydrodynamic equations*  
*hydrodynamics*  
*jet membrane process*  
*kinetics*  
*Lorentz gas*  
*magnetohydrodynamics*  
*molecular gases*  
*polar gases*  
*thermodynamics*  
*wave rotors*

*gas evacuating*

USE **evacuating (vacuum)**

### gas evolution

GS *evolution (liberation)*

**gas evolution**

RT *degassing*  
*outgassing*  
*transpiration*

### gas exchange

GS *exchanging*  
**gas exchange**

RT *oxygen production*

### gas expansion

GS *expansion*  
**gas expansion**

RT *Joule-Thomson effect*  
*pressure reduction*

### gas explosions

GS *explosions*  
*chemical explosions*  
**gas explosions**

RT *detonable gas mixtures*  
*detonation waves*  
*flame propagation*  
*flammable gases*  
*underground explosions*

### gas flow

UF *gaseous cavitation*

GS *fluid flow*  
**gas flow**  
*air flow*  
*air currents*  
*jet streams (meteorology)*  
*meridional flow*  
*vertical air currents*  
*continuum flow*  
*cooling flows (astrophysics)*  
*equilibrium flow*  
*frozen equilibrium flow*  
*shifting equilibrium flow*  
*free molecular flow*  
*Knudsen flow*  
*molecular flow*  
*slip flow*  
*transition flow*  
*nonequilibrium flow*  
*pipe flow*

RT *air ducts*  
*air jets*  
*compressible flow*  
*critical flow*  
*Crococ-Lee theory*  
*gas path analysis*  
*gasdynamic lasers*  
*gaseous diffusion*  
*gases*  
*geophysical fluid flow cells*  
*hydraulic analogies*  
*hypersonic flow*  
*incompressible flow*  
*inviscid flow*  
*Joule-Thomson effect*  
*laminar flow*  
*liquid flow*  
*magnetohydrodynamic flow*  
*mass flow*  
*molecular relaxation*  
*molecular trajectories*  
*multiphase flow*  
*nonuniform flow*  
*orifice flow*

∞ *pressure drop*  
*radial flow*  
*single-phase flow*  
*steady flow*  
*steam flow*  
*streams*  
*subcritical flow*  
*subsonic flow*  
*supercritical flow*  
*supersonic flow*  
*supersonic jet flow*  
*transonic flow*  
*turbulent flow*  
*two phase flow*  
*uniform flow*  
*unsteady flow*  
*vapor jets*

*viscous flow*

*gas generator engines*

USE **engines**  
**gas generators**

### gas generators

DEF A device used to generate gases in the laboratory; a chemical plant for producing gas from coal, for example, water gas. Used for gas generator engines.

UF *gas generator engines*

RT *chemical reactors*

∞ *generators*  
*pneumatic equipment*  
*pressurizing*  
*vaporizers*  
*wave rotors*

### gas giant planets

DEF The giant planets, Jupiter, Saturn, Uranus, and Neptune, of our solar system.

GS *celestial bodies*  
*planets*  
**gas giant planets**  
*Jupiter (planet)*  
*Neptune (planet)*  
*Saturn (planet)*  
*Uranus (planet)*

RT *extrasolar planets*  
*Jupiter red spot*  
*Neptune atmosphere*  
*planetary composition*  
*Saturn rings*  
*solar system*  
*Uranus atmosphere*

### gas guns

GS **gas guns**  
*light gas guns*

RT *atmospheric entry*  
*ballistics*

∞ *guns*  
*hypervelocity guns*  
*wind tunnels*

### gas heating

GS *heating*  
**gas heating**

RT *arc heating*  
*kinetic heating*  
*plasma heating*  
*radiant heating*  
*resistance heating*  
*thermal diffusion*

### gas injection

GS *injection*  
*fluid injection*  
**gas injection**

RT *formations*  
*fuel injection*  
*inflating*  
*perforating*  
*plasma pumping*  
*porosity*  
*pressurizing*  
*stimulation*  
*water injection*

### gas ionization

GS *ionization*  
**gas ionization**  
*atmospheric ionization*  
*auroral ionization*  
*flame ionization*

RT *afterglows*  
*electron attachment*  
*helium afterglow*  
*ionized gases*  
*ionizers*  
*Penning discharge*  
*Penning effect*  
*photoionization*  
*plasma display devices*  
*ring discharge*

### gas jets

GS *fluid jets*  
**gas jets**

- RT air jets  
cold gas  
∞ jets
- gas lasers**
- GS stimulated emission devices  
. lasers  
. **gas lasers**  
. . . carbon dioxide lasers  
. . . carbon monoxide lasers  
. . . DF lasers  
. . . excimer lasers  
. . . HCL lasers  
. . . . HCL argon lasers  
. . . . HCN lasers  
. . . helium-neon lasers  
. . . HF lasers  
. . . nitrogen lasers  
. . . rare gas-halide lasers  
. . . . krypton fluoride lasers  
. . . . xenon chloride lasers  
. . . . xenon fluoride lasers  
. . . TEA lasers  
. . . ultraviolet lasers
- RT carbon lasers  
chemical lasers  
electron pumping  
gasdynamic lasers  
infrared lasers  
Mach-Zehnder interferometers  
molecular oscillations  
nuclear pumping  
organic lasers  
polar gases  
pulsed lasers  
Q switched lasers  
stimulated emission  
water masers
- gas liquefaction*  
USE **condensing**
- gas lubricants**
- GS lubricants  
. **gas lubricants**
- RT gaseous diffusion  
high temperature lubricants  
metal-gas systems  
solid lubricants  
squeeze films
- gas lubricated bearings*  
USE **gas bearings**
- gas masers**
- GS stimulated emission devices  
. masers  
. . **gas masers**  
. . . hydrogen masers
- RT argon lasers  
atomic clocks  
carbon dioxide lasers  
frequency standards  
interstellar masers  
polar gases  
stimulated emission  
TEA lasers  
water masers
- gas meters**
- GS measuring instruments  
. flowmeters  
. . **gas meters**
- RT flow measurement  
Venturi tubes
- gas mixtures**
- GS gases  
. **gas mixtures**  
. . air  
. . . alveolar air  
. . . compressed air  
. . . expired air  
. . . high temperature air  
. . . liquid air  
. . . detonable gas mixtures  
mixtures  
. solutions  
. . **gas mixtures**  
. . . air  
. . . . alveolar air  
. . . . compressed air  
. . . . expired air  
. . . . high temperature air  
. . . . liquid air  
. . . . detonable gas mixtures  
RT argon-oxygen atmospheres  
∞ atmospheres  
binary fluids  
binary mixtures  
controlled atmospheres  
eudiometers  
exhaust gases  
fuel-air ratio  
fumes  
gaseous rocket propellants  
helium-oxygen atmospheres  
hydrogen-based energy  
ignition limits  
laminar mixing  
Lighthill gas model  
liquefied gases  
liquid-gas mixtures  
mixing ratios  
premixed flames  
premixing
- gas path analysis**  
DEF Mathematical process of determining overall engine performance, individual module performances and sensor performances from any specific set of engine related measurements.  
RT gas dynamics  
gas flow
- gas phases*  
USE **vapor phases**
- gas pipes**
- GS pipes (tubes)  
. **gas pipes**  
RT ∞ gas tubes
- gas pockets**
- RT cavities  
evacuating (vacuum)
- gas pressure**
- GS pressure  
. **gas pressure**
- RT atmospheric pressure  
compressed gas  
internal pressure  
partial pressure
- ∞ **gas reactors**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT chemical reactors  
gas cooled reactors  
gaseous fission reactors
- gas recovery**
- GS reclamation  
. materials recovery  
. . **gas recovery**
- RT energy technology  
exhaust gases  
gaseous diffusion  
gases  
∞ recovery  
wastes
- gas spectroscopy**
- GS spectroscopy  
. **gas spectroscopy**
- RT chemical analysis  
chemical tests  
flame spectroscopy  
magnetic spectroscopy  
mass spectroscopy  
optogalvanic spectroscopy  
spectroscopic analysis  
vacuum spectroscopy  
visible spectrum
- gas streams**
- GS gases  
. **gas streams**  
streams  
. **gas streams**
- RT jet flow  
laminar flow  
turbulence  
wind tunnels
- gas temperature**
- GS temperature  
. **gas temperature**
- RT atmospheric temperature  
inlet temperature  
ionized gases  
rarefied gases  
shock tubes  
shock waves  
temperature measurement
- gas transport**
- SN (ENCOMPASSES GAS DYNAMICS--EXCLUDES MATERIALS HANDLING)
- RT energy transfer  
gaseous diffusion  
heat transfer  
kinetic theory  
Lighthill gas model  
magnetohydrodynamics  
mass transfer  
pollution transport  
transport theory
- ∞ **gas tubes**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT cold cathode tubes  
gas discharge tubes  
gas pipes  
trigatrons
- gas tungsten arc welding**
- UF *TIG welding*  
*tungsten inert gas welding*
- GS welding  
. fusion welding  
. . electric welding  
. . . arc welding  
. . . . **gas tungsten arc welding**
- RT heat affected zone
- gas turbine engines**
- GS engines  
. air breathing engines  
. . **gas turbine engines**  
. . . hydrogen engines  
. . . jet engines  
. . . T-58 engine  
. . . . ramjet engines  
. . . . . integral rocket ramjets  
. . . . . low volume ramjet engines  
. . . . . pulsejet engines  
. . . . . supersonic combustion ramjet engines  
. . . . . turbofan engines  
. . . . . turbojet engines  
. . . . . Bristol-Siddeley Olympus 593 engine  
. . . . . Bristol-Siddeley Viper engine  
. . . . . ducted fan engines  
. . . . . J-33 engine  
. . . . . J-34 engine  
. . . . . J-47 engine  
. . . . . J-52 engine  
. . . . . J-57 engine  
. . . . . J-58 engine  
. . . . . J-65 engine  
. . . . . J-69-T-25 engine  
. . . . . J-71 engine  
. . . . . J-73 engine  
. . . . . J-75 engine  
. . . . . J-79 engine  
. . . . . J-85 engine  
. . . . . J-93 engine  
. . . . . RA-28 engine  
. . . . . turbofan engines  
. . . . . . Bristol-Siddeley BS 53 engine  
. . . . . . CF-700 engine  
. . . . . . convertible fan-shaft engines  
. . . . . . J-97 engine  
. . . . . . TF-30 engine

- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- internal combustion engines
- .. **gas turbine engines**
- .. hydrogen engines
- .. jet engines
- .. T-58 engine
- .. ramjet engines
- ..... integral rocket ramjets
- ..... low volume ramjet engines
- ..... pulsejet engines
- ..... supersonic combustion ramjet engines
- ..... turboramjet engines
- ..... turbojet engines
- ..... Bristol-Siddeley Olympus 593 engine
- ..... Bristol-Siddeley Viper engine
- ..... ducted fan engines
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- ..... J-65 engine
- ..... J-69-T-25 engine
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- ..... J-73 engine
- ..... J-75 engine
- ..... J-79 engine
- ..... J-85 engine
- ..... J-93 engine
- ..... RA-28 engine
- ..... turbofan engines
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- ..... CF-700 engine
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- ..... TF-41 engine
- ..... turboprop engines
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- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- turbine engines
- .. **gas turbine engines**
- .. hydrogen engines
- .. jet engines
- .. T-58 engine
- .. ramjet engines
- ..... integral rocket ramjets
- ..... low volume ramjet engines
- ..... pulsejet engines
- ..... supersonic combustion ramjet engines
- ..... turboramjet engines
- ..... turbojet engines
- ..... Bristol-Siddeley Olympus 593 engine
- ..... Bristol-Siddeley Viper engine
- ..... ducted fan engines
- ..... J-33 engine
- ..... J-34 engine
- ..... J-47 engine
- ..... J-52 engine
- ..... J-57 engine
- ..... J-58 engine
- ..... J-65 engine

- ..... J-65 engine
- ..... J-69-T-25 engine
- ..... J-71 engine
- ..... J-73 engine
- ..... J-75 engine
- ..... J-79 engine
- ..... J-85 engine
- ..... J-93 engine
- ..... RA-28 engine
- ..... turbofan engines
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- RT aircraft engines
- axial flow turbines
- Brayton cycle
- external combustion engines
- flameout
- steam turbines
- supersonic turbines
- turbogenerators
- two stage turbines
- wave rotors

**gas turbines**

DEF Turbines rotated by expanding gases, as in a turbojet engine or in a turbosupercharger.

- GS turbomachinery
- .. turbines

.. **gas turbines**

- RT axial flow turbines
- Brayton cycle
- closed cycles
- combined cycle power generation
- internal combustion engines
- spray ingestion
- steam turbines
- supersonic turbines
- turbogenerators
- two stage turbines

**gas valves**

- GS pneumatic equipment
- .. **gas valves**
- valves
- .. **gas valves**
- RT automatic control valves
- cocks
- dampers (valves)
- fuel valves
- relief valves

**gas viscosity**

- GS transport properties
- .. viscosity
- .. **gas viscosity**
- RT gaseous diffusion
- Lennard-Jones gas

**gas welding**

- SN (EXCLUDES ELECTRIC WELDING IN THE PRESENCE OF A CONTROLLED GASEOUS ATMOSPHERE)
- GS welding
- .. fusion welding
- .. **gas welding**
- .. brazing
- .. low temperature brazing
- RT gas-metal interactions
- pressure welding

**gasdynamic lasers**

- GS stimulated emission devices
- .. lasers

.. **gasdynamic lasers**

- RT gas flow
- gas lasers
- laser outputs
- plasmadynamic lasers
- tube lasers

*gaseous cavitation*

- USE **cavitation flow**
- gas flow**

**gaseous diffusion**

DEF A method of isotopic separation based on the fact that gas atoms or molecules with different masses will diffuse through a porous barrier (orm membrane) at different rates. The method is used to separate uranium 235 from uranium 238. It requires large gaseous diffusion plants and enormous amounts of electric power.

- UF *gas diffusion*
- GS diffusion
- .. **gaseous diffusion**
- .. gaseous self-diffusion
- transport properties
- .. **gaseous diffusion**
- .. gaseous self-diffusion

RT diffusion coefficient

- gas density
- gas dynamics
- gas flow
- gas lubricants
- gas recovery
- gas transport
- gas viscosity
- gas-gas interactions
- gas-ion interactions
- gas-liquid interactions
- gas-metal interactions
- mixing ratios
- molecular diffusion
- pollution transport
- thermal diffusion

**gaseous fission reactors**

- GS nuclear reactors
- .. **gaseous fission reactors**
- RT fissile fuels
- fissionable materials
- ∞ gas reactors
- nuclear lightbulb engines
- nuclear propulsion
- plasma propulsion

**gaseous fuels**

- GS fuels
- .. **gaseous fuels**
- .. natural gas
- .. liquefied natural gas
- gases
- .. flammable gases
- .. **gaseous fuels**
- .. natural gas
- .. liquefied natural gas
- RT lignite
- liquid fuels

**gaseous rocket propellants**

- GS propellants
- .. rocket propellants
- .. **gaseous rocket propellants**
- RT cryogenic rocket propellants
- endothermic fuels
- gas mixtures
- high energy propellants
- hybrid propellants
- hydrogen fuels
- liquid rocket propellants
- man operated propulsion systems
- monopropellants
- storable propellants

**gaseous self-diffusion**

- GS diffusion
- .. gaseous diffusion
- .. **gaseous self-diffusion**
- transport properties
- .. gaseous diffusion
- .. **gaseous self-diffusion**
- RT electron diffusion
- gas dynamics

kinetic theory  
molecular diffusion  
particle diffusion  
plasma diffusion

**gases**

## GS

**gases**

. ammonia  
. liquid ammonia  
. carbon dioxide  
. carbon monoxide  
. carbon suboxides  
. cold gas  
. compressed gas  
. high pressure oxygen  
. dissolved gases  
. exhaust gases  
. flue gases  
. flammable gases  
. gaseous fuels  
. . . natural gas  
. . . . liquefied natural gas  
. . . liquefied natural gas  
. pyrogen  
. gas mixtures  
. air  
. . . alveolar air  
. . . compressed air  
. . . expired air  
. . . high temperature air  
. . . liquid air  
. . . detonable gas mixtures  
. gas streams  
. gray gas  
. high temperature gases  
. . high temperature air  
. hydrogen  
. hydrogen isotopes  
. . . deuterium  
. . . hydrogen 4  
. . . metallic hydrogen  
. . . tritium  
. liquid hydrogen  
. ideal gas  
. ionized gases  
. . Lorentz gas  
. liquefied gases  
. . liquefied natural gas  
. liquid air  
. liquid ammonia  
. liquid fluorine  
. liquid helium  
. . . liquid helium 2  
. liquid hydrogen  
. liquid neon  
. liquid nitrogen  
. liquid oxygen  
. molecular gases  
. . polar gases  
. . polyatomic gases  
. . . diatomic gases  
. monatomic gases  
. neutral gases  
. nitrogen  
. liquid nitrogen  
. nitrogen isotopes  
. . . nitrogen 15  
. . . nitrogen 16  
. . solid nitrogen  
. noncondensable gases  
. nongray gas  
. nonpolar gases  
. ortho hydrogen  
. oxygen  
. liquid oxygen  
. oxygen isotopes  
. . . oxygen 17  
. . . oxygen 18  
. ozone  
. para hydrogen  
. phosgene  
. rare gases  
. argon  
. . . argon isotopes  
. helium  
. . . helium isotopes  
. . . liquid helium  
. . . . liquid helium 2  
. krypton

. . . krypton isotopes  
. . . . krypton 85  
. neon  
. . . liquid neon  
. . . neon isotopes  
. radon  
. . . radon isotopes  
. xenon  
. . . xenon isotopes  
. . . . xenon 129  
. . . . xenon 133  
. . . . xenon 135  
. rarefied gases  
. cosmic gases  
. . . interplanetary gas  
. . . interstellar gas  
. rarefied plasmas  
. real gases  
. residual gas  
. solidified gases  
. . solid cryogenes  
. . . solid nitrogen  
. sulfur hexafluoride  
. synthesis gas

## RT

∞ atmospheres  
coal gasification  
∞ fluids  
fumes  
gas dynamics  
gas flow  
gas recovery  
hydrogen clouds  
metal-gas systems  
nonpoint sources  
odors  
plasmas (physics)  
pneumatics  
prevaporization  
reaction products  
vapor phases  
vapors

**gas-gas interactions**

## GS

**gas-gas interactions**  
. association reactions  
RT Dalton law  
detonable gas mixtures  
exhaust emission  
gaseous diffusion  
∞ interactions

**gasification**GS **gasification**

. coal gasification  
. . hydrolysis  
RT synthane  
vaporizing

**gas-ion interactions**

UF *ion-gas interactions*  
RT gaseous diffusion  
∞ interactions

**gaskets**

DEF Preformed deformable devices designed to be placed between two adjoining parts to prevent the passage of liquid or gas between the parts.

GS seals (stoppers)

**gaskets**

RT labyrinth seals  
O ring seals  
pump seals

**gas-liquid interactions**GS **gas-liquid interactions**

. air water interactions  
. . air sea ice interactions  
RT condensing  
energy transfer  
evaporation  
gaseous diffusion  
heat transfer  
∞ interactions  
interfacial tension  
mass transfer  
momentum transfer  
noncondensable gases

surface reactions

**gas-metal interactions**

GS fluid-solid interactions  
. gas-solid interactions  
. . **gas-metal interactions**  
RT ablation  
adsorption  
chemical reactions  
chemisorption  
∞ condensation  
condensing  
corrosion  
diffusion  
evaporation  
exhaust emission  
flame propagation  
gas welding  
gaseous diffusion  
hot corrosion  
hydrogen embrittlement  
∞ interactions  
metal combustion  
metal vapors  
metal-gas systems  
occlusion  
solid phases  
sublimation  
sulfidation  
vapor phases

**gasohol (fuel)**

DEF Synthetic fuel consisting of a mixture of gasoline and grain alcohol (ethanol).

## GS

fuels  
. chemical fuels  
. . synthetic fuels  
. . . **gasohol (fuel)**

## RT

alcohols  
gasoline

**gasoline**

## GS

fuels  
. chemical fuels  
. . hydrocarbon fuels  
. . . **gasoline**  
. . liquid fuels  
. . . **gasoline**  
products  
. petroleum products  
. . **gasoline**

## RT

antiknock additives  
automobile fuels  
diesel fuels  
gasohol (fuel)  
jet engine fuels  
kerogen  
kerosene  
octane number  
shale oil  
solvent refined coal

## GASP

USE **Global Air Sampling Program**

**Gaspra asteroid**

(added July 1995)

## GS

celestial bodies  
. asteroids  
. . **Gaspra asteroid**

## RT

asteroid belts  
Galileo spacecraft  
meteoroids

**gas-solid interactions**

DEF Effects of the impingement of gases (particles) on solid surfaces in various environments.

## GS

fluid-solid interactions  
. **gas-solid interactions**  
. . gas-metal interactions

## RT

air land interactions  
dynamic loads  
fluid dynamics  
impingement  
∞ interactions  
panel method (fluid dynamics)

**gas-solid interfaces**

## GS

boundaries

## gastrointestinal system

. fluid boundaries  
. . . **gas-solid interfaces**  
interfaces  
. fluid boundaries  
. . . **gas-solid interfaces**  
RT boundary layers  
fluid-solid interactions  
heat transfer  
interface stability  
metal surfaces  
occlusion  
solid phases  
solid-solid interfaces  
solubility  
sublimation  
vapor phases

**gastrointestinal system**  
GS anatomy  
. digestive system  
. . . **gastrointestinal system**  
. . . appendix (anatomy)  
. . . intestines  
. . . . rectum  
. . . stomach  
RT abdomen  
colic  
gall  
glands (anatomy)  
liver  
organs  
pancreas  
∞ systems

*GATE (experiment)*  
USE **GARP Atlantic Tropical Experiment**

∞ **gates**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT closures  
gates (circuits)  
gates (openings)

**gates (circuits)**  
UF *OR-gates*  
GS circuits  
. **gates (circuits)**  
. . field-programmable gate arrays  
. . threshold gates  
RT coincidence circuits  
∞ gates  
logic circuits  
logical elements  
switching circuits  
threshold logic  
trigger circuits

**gates (openings)**  
RT apertures  
∞ barriers  
canals  
doors  
fences (barriers)  
∞ gates  
hatches  
hydraulic equipment  
openings  
outlets  
safety devices  
vents  
walls

**gauge invariance**  
GS invariance  
. **gauge invariance**  
RT electromagnetic radiation  
supergravity  
transformations (mathematics)

**gauge theory**  
DEF A field theory in which symmetries of the theory are implemented locally in space and time. This leads to theories where forces are generally carried by vector bosons. Some gauge theories are electrodynamics, quantum chromodynamics, and Yang Mills theory.  
GS field theory (physics)  
. **gauge theory**  
. . quantum chromodynamics

. . unified field theory  
. . . electroweak model  
. . . standard model (particle physics)  
RT gravitation theory  
string theory  
supergravity  
supersymmetry  
∞ theories  
Yang-Mills fields  
Yang-Mills theory

**Gauss equation**  
UF *Gauss function*  
GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **Gauss equation**  
RT ∞ equations  
Maxwell equation

*Gauss function*  
USE **Gauss equation**

*Gaussian distributions*  
USE **normal density functions**

**Gaussian elimination**  
DEF A technique for solving linear equations by progressive differencing.  
RT elimination  
linear equations  
matrices (mathematics)  
subtraction

*Gaussian noise*  
USE **random noise**

**Gauss-Markov theorem**  
GS theorems  
. **Gauss-Markov theorem**  
RT least squares method  
statistical analysis  
variance (statistics)

*Gaussmeters*  
USE **magnetometers**

**gauze**  
GS fabrics  
. **gauze**  
RT casts

**GAW-1 airfoil**  
UF *General Aviation Whitcomb airfoil*  
GS airfoils  
. wings  
. . **GAW-1 airfoil**  
RT ATLIT project  
PA-34 Seneca aircraft  
wing profiles

**GAW-2 airfoil**  
UF *General Aviation Whitcomb airfoil*  
GS airfoils  
. wings  
. . **GAW-2 airfoil**  
RT body-wing configurations  
flaps (control surfaces)  
general aviation aircraft  
wing profiles

*GC-130 aircraft*  
USE **C-130 aircraft**

*GCR (reactors)*  
USE **gas cooled reactors**

*GDOP*  
USE **geometric dilution of precision**

**GE 625 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . GE computers  
. . . . **GE 625 computer**

**GE 635 computer**  
GS data processing equipment  
. computers

. . digital computers  
. . . GE computers  
. . . . **GE 635 computer**

**GE computers**  
UF *General Electric computers*  
GS data processing equipment  
. computers  
. . digital computers  
. . . **GE computers**  
. . . . GE 625 computer  
. . . . GE 635 computer

∞ **gear**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT arresting gear  
gears  
landing gear  
mechanical drives

**gear teeth**  
RT bevel gears  
gears  
mechanical drives

*gearboxes*  
(added October 1997)  
USE **transmissions (machine elements)**

**gears**  
GS **gears**  
. bevel gears  
. racks (gears)  
. . spiral bevel gears  
RT counter-rotating wheels  
∞ gear  
gear teeth  
idler  
lubrication  
mechanical drives  
transmissions (machine elements)  
wheels  
windmills (windpowered machines)

**gegenschein**  
DEF A round or elongated spot of light in the sky at a point 180 degrees from the sun. Also called counter glow.  
GS electromagnetic radiation  
. light (visible radiation)  
. . **gegenschein**  
extraterrestrial radiation  
. **gegenschein**  
RT night sky  
polarized light  
sky brightness  
solar radiation  
terrestrial dust belt  
zodiacal light

**gehlenite**  
DEF A mineral of the mellite group. It is isomorphous with akermanite. Used for ver-lardenite.  
UF *velardenite*  
GS aluminum compounds  
. aluminum silicates  
. . **gehlenite**  
calcium compounds  
. calcium silicates  
. . **gehlenite**  
minerals  
. **gehlenite**  
silicon compounds  
. silicates  
. . aluminum silicates  
. . . **gehlenite**  
. . calcium silicates  
. . . **gehlenite**  
RT aluminum oxides

**Geiger counters**  
DEF Instruments for detecting and measuring radioactivity. In full, Geiger-Mueller counter. Used for Geiger-Mueller tubes.  
UF *Geiger-Mueller tubes*  
GS ionization chambers  
. **Geiger counters**  
measuring instruments

- . counters
- .. radiation counters
- ... **Geiger counters**
- . radiation measuring instruments
- .. radiation counters
- ... **Geiger counters**
- RT dosimeters
- neutron counters
- overvoltage
- particle telescopes
- proportional counters
- radiation detectors

*Geiger-Mueller tubes*

USE **Geiger counters**

**gel chromatography**  
(added August 2004)

DEF Chromatography on non-ionic gels without regard to the mechanism of solute discrimination.

UF *gel filtration chromatography*  
*gel permeation chromatography*

GS chemical tests

- . chemical analysis
- .. chromatography
- ... **gel chromatography**

RT chemical analysis

liquid chromatography

*gel filtration chromatography*  
(added November 2001)

USE **gel chromatography**

*gel permeation chromatography*

USE **gel chromatography**

**gelatins**

RT collagens

- ∞ food
- gels
- nonNewtonian fluids

**gelation**

RT coagulation

- colloiding
- gels
- solidification
- thixotropy

*gelbstoff*  
(added October 1997)

USE **dissolved organic matter**

**gelled propellants**

GS propellants

- . **gelled propellants**
- .. gelled rocket propellants

RT chemical fuels

- colloidal propellants
- high temperature propellants
- hydrogen fuels
- metal fuels
- metal propellants
- plastic propellants
- propellant additives
- solid propellants

**gelled rocket propellants**

UF *thixotropic propellants*

GS propellants

- . gelled propellants
- .. **gelled rocket propellants**
- .. rocket propellants
- .. liquid rocket propellants
- ... **gelled rocket propellants**

RT chemical fuels

- cryogenic rocket propellants
- gels
- high temperature propellants
- hybrid propellants
- hypergolic rocket propellants
- metal propellants
- monopropellants
- slurry propellants
- solid rocket propellants
- storable propellants

**gels**

DEF Liquids containing colloidal structural

networks that form continuous matrices and completely pervade the liquid phase. Gels deform elastically upon application of shear forces less than the yield stress. At shear forces above the yield stress, the flow properties are principally determined by the gel matrices.

GS **gels**

- . double base rocket propellants
- . silica gel
- . xerogels

RT aerogels

- colloids
- dopes
- gelatins
- gelation
- gelled rocket propellants
- nonNewtonian fluids
- slurries
- thickeners (materials)
- thixotropy

**Gemini 2 spacecraft**

GS manned spacecraft

- . Gemini spacecraft
- .. **Gemini 2 spacecraft**
- .. reentry vehicles
- .. recoverable spacecraft
- .. Gemini spacecraft
- ... **Gemini 2 spacecraft**
- .. soft landing spacecraft
- .. Gemini spacecraft
- .. **Gemini 2 spacecraft**

RT manned space flight

**Gemini 3 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 3 flight**

RT Titan launch vehicles

**Gemini 4 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 4 flight**

**Gemini 5 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 5 flight**

**Gemini 6 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 6 flight**

**Gemini 7 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 7 flight**

RT Titan launch vehicles

**Gemini 8 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 8 flight**

RT Titan launch vehicles

**Gemini 9 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 9 flight**

RT Titan launch vehicles

**Gemini 10 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 10 flight**

RT Titan launch vehicles

**Gemini 11 flight**

GS space flight

- . manned space flight

- .. Gemini flights
- ... **Gemini 11 flight**

RT Titan launch vehicles

**Gemini 12 flight**

GS space flight

- . manned space flight
- .. Gemini flights
- ... **Gemini 12 flight**

RT Titan launch vehicles

**Gemini (GT-1) spacecraft**

GS manned spacecraft

- . Gemini spacecraft
- .. **Gemini (GT-1) spacecraft**
- .. reentry vehicles
- .. recoverable spacecraft
- .. Gemini spacecraft
- ... **Gemini (GT-1) spacecraft**
- .. soft landing spacecraft
- .. Gemini spacecraft
- .. **Gemini (GT-1) spacecraft**

RT manned space flight

**Gemini B spacecraft**

GS manned spacecraft

- . **Gemini B spacecraft**
- .. reentry vehicles
- .. recoverable spacecraft
- .. **Gemini B spacecraft**
- .. soft landing spacecraft
- . **Gemini B spacecraft**

RT manned space flight

**Gemini flights**

GS space flight

- . manned space flight
- .. **Gemini flights**
- ... Gemini 3 flight
- ... Gemini 4 flight
- ... Gemini 5 flight
- ... Gemini 6 flight
- ... Gemini 7 flight
- ... Gemini 8 flight
- ... Gemini 9 flight
- ... Gemini 10 flight
- ... Gemini 11 flight
- ... Gemini 12 flight

**Gemini project**

GS programs

- . NASA programs
- .. NASA space programs
- ... **Gemini project**
- .. projects
- .. **Gemini project**
- .. space programs
- .. NASA space programs
- ... **Gemini project**

RT Agena B rocket vehicle

- Agena rocket vehicles
- Atlas launch vehicles
- integrated mission control center
- Mercury project
- Titan project

**Gemini spacecraft**

GS manned spacecraft

- . **Gemini spacecraft**
- .. Gemini 2 spacecraft
- .. Gemini (GT-1) spacecraft
- .. reentry vehicles
- .. recoverable spacecraft
- .. **Gemini spacecraft**
- ... Gemini 2 spacecraft
- ... Gemini (GT-1) spacecraft
- .. soft landing spacecraft
- . **Gemini spacecraft**
- .. Gemini 2 spacecraft
- .. Gemini (GT-1) spacecraft

RT manned space flight

- space capsules
- Titan project

**Geminid meteoroids**

GS celestial bodies

- . meteoroid showers
- .. **Geminid meteoroids**
- . meteoroids

. . **Geminid meteoroids**

**gene expression**

DEF The process by which a gene's coded information is converted into the structures present and operating in the cell.

- UF *gene regulation*
- RT biological diversity  
biological evolution  
chromosomes  
cloning (biology)  
deoxyribonucleic acid  
evolution (development)  
gene expression regulation  
gene therapy  
genes  
genetically modified plants  
genetics  
molecular biology  
mutagenesis  
oncogenes  
phenotype  
ribonucleic acids  
transcription (genetics)

**gene expression regulation**

(added August 2004)

DEF Any of the processes by which nuclear, cytoplasmic, or intercellular factors influence the differential control of gene action at the level of transcription or translation. These processes include gene activation and genetic induction.

- RT gene expression  
gene therapy  
genes  
transcription (genetics)

*gene regulation*

USE **gene expression**

**gene therapy**

(added February 2002)

DEF The introduction of new genes into cells for the purpose of treating disease by restoring or adding gene expression.

- GS therapy
  - . **gene therapy**
- RT chromosomes  
deoxyribonucleic acid  
gene expression  
gene expression regulation  
genetic engineering  
plasmids

**general aviation aircraft**

- UF *executive aircraft*  
*private aircraft*

GS **general aviation aircraft**

- . agricultural aircraft
- . Beechcraft 18 aircraft
- . C-33 aircraft
- . C-35 aircraft
- . Cessna 172 aircraft
- . Cessna 205 aircraft
- . Cessna 210 aircraft
- . Cessna 402B aircraft
- . CL-600 challenger aircraft
- . DH 125 aircraft
- . DHC 2 aircraft
- . DO-27 aircraft
- . DO-28 aircraft
- . G-1 aircraft
- . HC-3 helicopter
- . Yak 40 aircraft

- RT ∞ aeronautics  
air transportation  
∞ aircraft  
civil aviation  
commercial aircraft  
commuter aircraft  
GAW-2 airfoil  
helicopters  
jet aircraft  
light aircraft  
∞ low wing aircraft  
passenger aircraft  
Piper aircraft  
single engine aircraft  
∞ subsonic aircraft  
training aircraft

- transport aircraft
- turboprop aircraft
- utility aircraft

*General Aviation Whitcomb airfoil*

USE **GAW-1 airfoil**  
**GAW-2 airfoil**

**General Dynamics aircraft**

GS **General Dynamics aircraft**

- . B-58 aircraft
- . C-131 aircraft
- . CL-41 aircraft
- . CL-44 aircraft
- . CL-84 aircraft
- . CV-340 aircraft
- . CV-440 aircraft
- . CV-880 aircraft
- . CV-990 aircraft
- . F-102 aircraft
- . F-106 aircraft
- . F-111 aircraft

- RT ∞ aircraft  
Canadair aircraft  
PA-34 Seneca aircraft

*General Electric computers*

USE **GE computers**

**general overviews**

(added February 1993)

- RT bibliographies  
recommendations  
surveys  
technology utilization

*General Purpose Heat Sources*

(added December 2002)

USE **radioisotope heat sources**

**generalization (psychology)**

- RT transfer of training

∞ **generation**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
cogeneration  
heat generation  
initiation  
regeneration (engineering)
- RT

∞ **generators**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT AC generators  
arc generators  
boilers  
cavity vapor generators  
colloidal generators  
DC generators  
decommutators  
direct power generators  
duochromators  
electric generators  
electrostatic generators  
energy conversion efficiency  
function generators  
gas generators  
Hall generators  
harmonic generators  
homopolar generators  
impulse generators  
linear alternators  
magnetohydrodynamic generators  
motors  
noise generators  
photoelectric generators  
plasma generators  
pulse generators  
radiation sources  
report generators  
rotating generators  
shock wave generators  
signal generators  
solar sea power plants  
sound generators  
stators  
stimulated emission devices  
subharmonic generators

- test pattern generators
- thermoelectric generators
- tide powered generators
- turbogenerators
- vaporizers
- voltage generators
- vortex generators
- wave generation
- windpowered generators

**genes**

- GS **genes**
  - . oncogenes
  - . tumor suppressor genes
- RT chromosome aberrations  
chromosomes  
cloning (biology)  
deoxyribonucleic acid  
gene expression  
gene expression regulation  
genetic code  
genetic engineering  
genetics  
genome  
molecular biology  
mutagenesis  
mutations  
phenotype  
ribonucleic acids  
telomeres

**Genesis mission**

(added February 1999)

DEF A space mission to collect solar wind samples from a halo orbit about the sun-Earth L1 point for two years, returning those samples to Earth in 2003 for analysis and examination. Analysis of the samples collected by the mission will contribute to an understanding of the origins of the solar system.

- GS space missions
  - . **Genesis mission**
- RT solar system evolution  
solar wind

**genetic algorithms**

(added December 1992)

DEF Parameter search procedures loosely based on the mechanics of natural population genetics and the survival-of-the-fittest.

- GS mathematical logic
  - . algorithms
  - . . **genetic algorithms**  
optimization
  - . **genetic algorithms**
- RT artificial intelligence  
control systems design  
design optimization  
evolvable hardware  
machine learning  
multidisciplinary design optimization  
neural nets  
optimal control  
parameter identification  
trajectory optimization

**genetic code**

DEF The sequence of nucleotides, coded in triplets along the messenger RNA that determines the sequence of amino acids in protein synthesis.

- RT chromosomes  
cloning (biology)  
genes  
genetics  
genome

*genetic diversity*

USE **biological diversity**

**genetic engineering**

DEF The intentional production of new genes and alteration of genomes by the substitution or addition of new genetic material. Used for hybrids (biology).

- UF *hybrids (biology)*
- RT biochemistry  
bioengineering  
∞ biology  
biosynthesis

- clone cells  
cloning (biology)  
gene therapy  
genes  
genetically modified plants  
genetics  
genome  
phenotype  
plasmids  
polymerase chain reaction
- genetically modified plants**  
(added August 2004)  
DEF Plants, or their progeny, whose genome has been altered by genetic engineering.  
GS plants (botany)  
  . **genetically modified plants**  
RT agriculture  
  botany  
  crop vigor  
  gene expression  
  genetic engineering  
  genome  
  phenotype
- genetics**  
RT biological diversity  
  biological evolution  
∞ biology  
  breeding (reproduction)  
  chromosomes  
  cloning (biology)  
  congenital anomalies  
  cytogenesis  
  dominance  
  evolution (development)  
  gene expression  
  genes  
  genetic code  
  genetic engineering  
  mutagens  
  mutations  
  neurospora  
  nuclei (cytology)  
  nucleogenesis  
  species diffusion  
  transcription (genetics)
- Genie rocket vehicle**  
UF *MB-1 rocket vehicle*  
GS rocket vehicles  
  . single stage rocket vehicles  
  . . **Genie rocket vehicle**  
RT Astrobee rocket vehicles  
  solid propellant rocket engines
- genitourinary system**  
GS anatomy  
  . **genitourinary system**  
  . . bladder  
  . . kidneys  
  . . . glomerulus  
  . . . reproductive systems  
  . . . sex glands  
  . . . . gonads  
  . . . . ovaries  
  . . . . testes  
  . . . . prostate gland  
  . . . uterus  
RT gynecology  
  kidney stones  
  organs  
∞ systems  
  urology
- genome**  
(added September 2001)  
DEF An organism's genetic complement as represented in its DNA or, in some cases, its RNA.  
RT deoxyribonucleic acid  
  genes  
  genetic code  
  genetic engineering  
  genetically modified plants  
  proteome
- ribonucleic acids
- GEO environments*  
USE **Earth orbital environments**
- geostrophysics*  
USE **astrophysics**
- geobotany**  
GS botany  
  . **geobotany**  
RT biogeochemistry  
  geographic distribution  
  plants (botany)  
  rain forests  
  trees (plants)
- geocentric coordinates**  
GS coordinates  
  . planetocentric coordinates  
  . . **geocentric coordinates**  
RT astronomical coordinates  
  celestial reference systems  
  inertial coordinates  
  planet ephemerides  
  spherical coordinates
- geochemistry**  
DEF The study of the distribution of the amounts of the chemical elements in minerals, ores, rocks, soils, water, and the atmosphere. Also, the study of the circulation of the elements in nature, on the basis of the properties of the atom and ions. A major concern of geochemistry is the synoptic evaluation of the abundance of the elements of the Earth's crust and in major classes of rocks and minerals.  
GS environmental chemistry  
  . **geochemistry**  
  . . biogeochemistry  
RT abundance  
∞ chemistry  
  cosmochemistry  
  Earth sciences  
  geochronology  
  geology  
  geophysics  
  hydrology  
  isotope ratios  
  limnology  
  marine chemistry  
  mineralogy  
  paleobiology  
  paleontology  
  petrology  
  radioactivity  
  siderophile elements  
  submarine hydrothermal vents
- geochronology**  
DEF The study of time in relationship to the history of the Earth, especially by the absolute age determination and relative dating systems developed for this purpose.  
GS chronology  
  . **geochronology**  
  geology  
  . **geochronology**  
RT Cambrian Period  
  Cenozoic Era  
  Cretaceous Period  
  Cretaceous-Tertiary boundary  
  dendrochronology  
  geochemistry  
  geophysics  
  Holocene epoch  
  isotope ratios  
  magnetostratigraphy  
  Mesozoic Era  
  paleobiology  
  paleontology  
  Paleozoic Era  
  particle tracks  
  petrogenesis  
  Pleistocene epoch  
  Quaternary period  
  radioactive age determination  
  stratigraphy
- Tertiary Period
- geocoronal emissions**  
GS atmospheric radiation  
  . sky radiation  
  . . airglow  
  . . . **geocoronal emissions**  
  electromagnetic radiation  
  . light (visible radiation)  
  . . sky radiation  
  . . . airglow  
  . . . . **geocoronal emissions**
- geocyclotrons**  
GS particle accelerators  
  . cyclotrons  
  . . **geocyclotrons**  
RT ∞ accelerators  
  elementary particles
- geodesic lines**  
GS geometry  
  . Euclidean geometry  
  . . lines (geometry)  
  . . . **geodesic lines**  
RT chords (geometry)  
  curves (geometry)
- geodesy**  
DEF The science which deals mathematically with the size and shape of the Earth, and the Earth's external gravity field, and with surveys of such precision that overall size and shape of the Earth must be taken into consideration. Used for Earth figure, Earth shape, and Lszak ellipsoid.  
UF *Earth figure*  
  *Earth shape*  
  *Lszak ellipsoid*  
GS **geodesy**  
  . celestial geodesy  
RT altimetry  
  Earth (planet)  
  Earth axis  
  geodetic accuracy  
  geodetic surveys  
  geoids  
  geology  
  geophysics  
  gravimeters  
  lunar retroreflectors  
  oblate spheroids  
  OGO-4  
  OGO-5  
  perturbation  
  photomapping  
  polar wandering (geology)  
  satellite altimetry  
  satellite doppler positioning  
  topography  
  vinti theory
- geodetic accuracy**  
DEF The degree to which point positions or boundaries indicated on maps or imagery correspond with true geodetic positions.  
GS accuracy  
  . **geodetic accuracy**  
RT Earth surface  
  geodesy  
  geoids  
  geopotential height  
  satellite doppler positioning
- geodetic coordinates**  
DEF Quantities that define the position of a point on the spheroid of reference with respect to the planes of the geodetic equator and of a reference meridian.  
GS coordinates  
  . **geodetic coordinates**  
RT International Satellite Geodesy  
  Experiment  
  latitude  
  longitude  
∞ nets  
  satellite doppler positioning
- geodetic satellites**  
GS artificial satellites



## geodetic surveys

### . geodetic satellites

- .. ANNA satellites
- .. Explorer 29 satellite
- .. Explorer 36 satellite
- .. GEOLE satellites
- .. GEOS 1 satellite
- .. GEOS 2 satellite
- .. GEOS 3 satellite
- .. Geosat satellites
- .. LARGOS satellite
- .. PAGEOS satellite
- .. Vanguard 1 satellite

RT

- active satellites
- celestial geodesy
- navigation satellites
- NAVSTAR satellites
- passive satellites
- satellite altimetry
- satellite doppler positioning
- satellite laser ranging
- Vanguard satellites

### geodetic surveys

DEF Surveys which takes into account the size and shape of the Earth.

GS surveys

#### . geodetic surveys

RT

- geodesy
- geological surveys
- Phoenix quadrangle (AZ)
- satellite doppler positioning
- topography

### geodimeters

DEF Trade name of electronic-optical devices that measure ground distances precisely by electronic timing and phase comparison of modulated light waves that travel from a master unit to a reflector and return to a light-sensitive tube where an electric current is set up. They are normally used at night and are effective with first-order accuracy up to distances of 5-40 km (3-25 miles). The term is derived from GEODetic DIstance METER.

GS measuring instruments

- . distance measuring equipment

#### .. geodimeters

- . optical measuring instruments

#### .. geodimeters

- optical equipment

- . optical measuring instruments

#### .. geodimeters

RT optical measurement

- range finders
- tellurometers

### Geodynamic Experimental Ocean Satellite

USE **GEOS-D satellite**

### geodynamics

DEF Study of the dynamic forces or processes within the Earth. Used for crustal dynamics.

UF *crustal dynamics*

RT Chandler wobble

- crustal fractures

∞ dynamics

- Earth movements
- Earth sciences
- geomorphology
- geophysics
- planetary quakes
- shock waves
- terradyamics

### geoelectricity

DEF The Earth's natural electric fields and phenomena. It is closely related to geomagnetism.

GS electricity

- . **geoelectricity**

- .. telluric currents

RT Earth (planet)

- field aligned currents
- geophysics

geopotential

### geofabrics

USE **geotechnical fabrics**

### geofractures

USE **geological faults**

### geographic applications program

GS programs

- . space programs

#### .. geographic applications program

RT

- Earth resources
- Earth Resources Program
- geography
- mapping
- NASA programs
- remote sensors
- satellite-borne photography
- soil mapping
- terrain analysis

### geographic distribution

(added June 1995)

GS distribution (property)

- . spatial distribution

#### .. geographic distribution

RT ∞ distribution

- economic development
- geobotany
- geomorphology
- populations
- remote sensing
- species diffusion
- vegetative index

### geographic information systems

DEF Computer assisted systems that acquire, store, manipulate, and display geographic data. Some systems are not automated.

GS information systems

#### . geographic information systems

RT

- aerial photography
- data systems
- geography
- imagery
- infrared photography
- remote sensing

### geography

DEF The study of all aspects of the Earth's surface including its natural and political divisions, the distribution and differentiation of areas and, often, man in relationship to his environment.

GS **geography**

- . hypsography
- . orography

RT

- Arctic regions
- cadastral mapping
- climatology
- continents
- Earth (planet)
- Eastern Hemisphere
- economic development
- estuaries
- geographic applications program
- geographic information systems
- geomorphology
- Heat Capacity Mapping Mission
- mapping
- maps
- oceanography
- oceans
- plains
- polar regions
- selenography
- temperate regions
- tropical regions
- tundra
- Western hemisphere

### geoids

DEF The figure of the Earth as defined by the geopotential surface which most nearly coincides with mean sea level over the entire surface of the Earth.

RT

- altimetry
- geodesy

geodetic accuracy

geometry

geophysics

GRACE mission

oblate spheroids

satellite altimetry

shapes

spheroids

symmetrical bodies

### GEOLE satellites

GS

- artificial satellites
- . French satellites
- .. **GEOLE satellites**
- . geodetic satellites
- .. **GEOLE satellites**
- . meteorological satellites
- .. **GEOLE satellites**

RT

- EOLE satellites
- French space program

### geological faults

DEF A surface or zone of rock fracture along which there has been displacement, from a few centimeters to a few kilometers in scale. Used for closed faults, cross faults, echelon faults, geofractures, grabens, rifts, splits (geology), step faults, and thrust faults.

UF

*closed faults*

*cross faults*

*echelon faults*

*geofractures*

*grabens*

*rifts*

*splits (geology)*

*step faults*

*thrust faults*

GS

#### **geological faults**

- . African rift system

RT

- San Andreas Fault
- crevasses
- crustal fractures
- earthquake damage
- earthquakes

∞ faults

fissures (geology)

folds (geology)

formations

inliers (landforms)

landforms

massifs

mid-ocean ridges

plates (tectonics)

Rouse belts

San Andreas Fault experiment

synclines

### geological surveys

GS surveys

#### . **geological surveys**

RT

- exploration
- geodetic surveys
- geology
- geophysics
- paleontology
- petrology
- photogeology
- radar geology

### geology

DEF The study of the planet Earth--the materials of which it is made, the processes that act on these materials, the products formed, and the history of the planet and its life forms since its origin. Geology considers the physical forces that act on the Earth, the chemistry of its constituent materials, and the biology of its past inhabitants as revealed by fossils. Clues on the origin of the planet are sought in a study of the Moon and other extraterrestrial bodies. The knowledge thus obtained is placed in the service of man--to aid in the discovery of minerals and fuels of value in the Earth's crust, to identify geologically stable sites for major structures, and to provide foreknowledge of some of the dangers associated with the mobile forces in a dynamic Earth.

GS

#### **geology**

- . beds (geology)
- .. salt beds

- . cones (volcanoes)
- . contacts (geology)
- . crossbedding (geology)
- . domes (geology)
- . gaps (geology)
- . geochronology
- . geomorphology
- . glaciology
- . hydrogeology
- . kettles (geology)
- . lunar geology
- . orography
- . petrology
- . . lithology
- . . petrogenesis
- . . petrography
- . photogeology
- . planetary geology
- . . Mars volcanoes
- . radar geology
- . structural properties (geology)
- . subduction (geology)
- . tectonics
- . . neotectonics
- . volcanoes
- . . Mars volcanoes
- . volcanology
- RT bedrock
- boreholes
- bridges (landforms)
- Canadian Shield
- continental shelves
- Earth (planet)
- Earth planetary structure
- Earth sciences
- exploitation
- exploration
- fiords
- formations
- geochemistry
- geodesy
- geological surveys
- geophysical observatories
- geophysics
- geopressure
- geotemperature
- gravimetry
- Great Basin (US)
- inliers (landforms)
- isthmuses
- kreep
- massifs
- meteorology
- mineral deposits
- mineralogy
- minerals
- morphology
- ocean bottom
- oceanography
- oil exploration
- outcrops
- paleomagnetism
- paleontology
- photomapping
- ∞ physical sciences
- Precambrian period
- regolith
- rock mechanics
- rocks
- ∞ science
- seismology
- shatter cones
- soils
- stratigraphy
- structural basins
- geomagnetic anomalies*
- USE **magnetic anomalies**
- geomagnetic crotchets*
- USE **sudden ionospheric disturbances**
- geomagnetic effects*
- USE **magnetic effects**
- geomagnetic equator*
- USE **magnetic equator**
- geomagnetic field*
- USE **geomagnetism**
- geomagnetic hollow**
- GS anomalies
- . magnetic anomalies
- . . **geomagnetic hollow**
- RT Earth magnetosphere
- magneto-hydrodynamic flow
- plasma clouds
- geomagnetic latitude**
- DEF Angular distances from the geomagnetic equator, measured northward or southward through 90 degrees and labeled N or S to indicate the direction of measurement.
- GS latitude
- . **geomagnetic latitude**
- RT coordinates
- geomagnetism
- polar cusps
- geomagnetic micropulsations**
- GS pulses
- . geomagnetic pulsations
- . . **geomagnetic micropulsations**
- . micropulsations
- . . **geomagnetic micropulsations**
- variations
- . magnetic variations
- . . geomagnetic pulsations
- . . . **geomagnetic micropulsations**
- RT nocturnal variations
- telluric currents
- geomagnetic pulsations**
- GS pulses
- . **geomagnetic pulsations**
- . . geomagnetic micropulsations
- variations
- . magnetic variations
- . . **geomagnetic pulsations**
- . . . geomagnetic micropulsations
- RT geomagnetism
- KP index
- magnetospheric instability
- nocturnal variations
- geomagnetic storms*
- USE **magnetic storms**
- geomagnetic tail**
- SN (RESTRICTED TO THE EARTH MAGNETOTAL)
- UF *Earth magnetotail*
- GS environments
- . Earth magnetosphere
- . . **geomagnetic tail**
- RT field aligned currents
- geomagnetism
- magnetic fields
- magnetic islands
- ∞ magnetotails
- planetary magnetic fields
- planetary magnetotails
- polar cusps
- geomagnetically trapped particles*
- USE **radiation belts**
- geomagnetism**
- DEF The magnetic phenomena, collectively considered, exhibited by the Earth and its atmosphere and by extension the magnetic phenomena in interplanetary space. The study of the magnetic field of the Earth. Used for geomagnetic field and terrestrial magnetism.
- UF *geomagnetic field*
- terrestrial magnetism*
- GS magnetic fields
- . **geomagnetism**
- magnetic properties
- . **geomagnetism**
- RT aeromagnetism
- barium ion clouds
- Birkeland currents
- continental drift
- dynamo theory
- Earth (planet)
- Earth gravitation
- Earth magnetosphere
- Earth sciences
- electrojets
- field aligned currents
- field theory (physics)
- flux transfer events
- geomagnetic latitude
- geomagnetic pulsations
- geomagnetic tail
- geophysics
- ∞ inclination
- International Magnetospheric Study
- KP index
- M region
- magnetic anomalies
- magnetic disturbances
- magnetic effects
- magnetic equator
- magnetic poles
- magnetic surveys
- magnetoionics
- magnetometers
- magnetosheath
- MagSat 1 satellite
- Magsat A satellite
- MagSat B satellite
- MagSat satellites
- paleomagnetism
- planetary magnetic fields
- polar cusps
- Polar/GGS spacecraft
- space plasmas
- space weather
- variometers
- geometric accuracy**
- DEF The internal geometric fidelity of an imaging system.
- GS accuracy
- . **geometric accuracy**
- RT distortion
- geometric rectification (imagery)
- image processing
- image resolution
- geometric dilution of precision**
- DEF A navigation and positioning system performance index expressing the dilution of range measurement precision due to the geometric relationship between user and satellites. It is formulated as the square root of the sum of the variances of position estimates in the three orthogonal directions and can be employed to determine the optimal locations for network satellites and in the selection of optimal satellite signals sources. Used for GDOP.
- UF *GDOP*
- GS dilution
- . **geometric dilution of precision**
- RT precision
- geometric rectification (imagery)**
- DEF The correction of image distortions due to sensor view angle, platform attitude, or target surface features.
- GS image processing
- . **geometric rectification (imagery)**
- rectification
- . **geometric rectification (imagery)**
- RT atmospheric correction
- geometric accuracy
- image enhancement
- imagery
- geometrical acoustics**
- DEF The study of the behavior of sound under the assumption that sound transversing a homogeneous medium travels along straight lines or rays. Used for ray acoustics.
- UF *ray acoustics*
- GS acoustics
- . **geometrical acoustics**
- RT geometrical theory of diffraction
- geometry
- wave propagation
- geometrical hydromagnetics*
- USE **magneto-hydrodynamics**
- geometrical optics**
- DEF The geometry of paths of light rays and their imagery through optical systems. Used for ray optics.
- UF *ray optics*
- RT acousto-optics

asphericity  
 astigmatism  
 Cassegrain optics  
 crystal optics  
 diffraction propagation  
 eikonal equation  
 fiber optics  
 focusing  
 geometrical theory of diffraction  
 gradient index optics  
 holographic optical elements  
 light (visible radiation)  
 light transmission  
 nonlinear optics  
 numerical aperture  
 optical equipment  
 optical measurement  
 optical paths  
 optical properties  
 optical reflection  
 ∞ optics  
 physical optics  
 ray tracing  
 Snells law  
 underwater optics  
 x ray optics

**geometrical theory of diffraction**

DEF A ray theory of diffraction process.  
 RT diffraction  
 diffraction patterns  
 geometrical acoustics  
 geometrical optics  
 ray tracing  
 reflectance  
 ∞ theories  
 wave diffraction

*geometroynamics*

USE **relativity**

**geometry**

GS **geometry**  
 . Bose geometry  
 . computational geometry  
 . crack geometry  
 . curvature  
 . curves (geometry)  
 . . catenaries  
 . . cycloids  
 . . epicycloids  
 . . S curves  
 . . . Gompertz curves  
 . . cusps (mathematics)  
 . . double cusps  
 . differential geometry  
 . . lie groups  
 . . . spinor groups  
 . . Riemann manifold  
 . . tensor analysis  
 . duct geometry  
 . Euclidean geometry  
 . . analytic geometry  
 . . . catenaries  
 . . . circumferences  
 . . . conics  
 . . . . ellipses  
 . . . . hyperbolas  
 . . . . parabolas  
 . . . cycloids  
 . . . epicycloids  
 . . . loci  
 . . Mercator projection  
 . . . quadrants  
 . . . S curves  
 . . . . Gompertz curves  
 . . . spheroids  
 . . . . oblate spheroids  
 . . . . prolate spheroids  
 . . . tangents  
 . . . toruses  
 . . . trigonometry  
 . . angles (geometry)  
 . . . angle of attack  
 . . . . zero angle of attack  
 . . . Bragg angle  
 . . . Brewster angle  
 . . . dihedral angle  
 . . . elevation angle  
 . . . look angles (electronics)

. . . look angles (tracking)  
 . . . sweep angle  
 . . . . sweepback  
 . . . . leading edge sweep  
 . . Cartesian coordinates  
 . . circles (geometry)  
 . . . great circles  
 . . descriptive geometry  
 . . lines (geometry)  
 . . . chords (geometry)  
 . . . geodesic lines  
 . . points (mathematics)  
 . . . fixed points (mathematics)  
 . . . inflection points  
 . . polygons  
 . . . hexagons  
 . . . tetragons  
 . . . . parallelograms  
 . . . . rhomboids  
 . . . . rectangles  
 . . . . squares (mathematics)  
 . . . . trapezoids  
 . . . triangles  
 . . polyhedrons  
 . . . cubes (mathematics)  
 . . . icosahedrons  
 . . . octahedrons  
 . . . parallelepipeds  
 . . . pyramids  
 . . . rhombohedrons  
 . . . tetrahedrons  
 . . projective geometry  
 . . . Mercator projection  
 . . radii  
 . . . Larmor radius  
 . flow geometry  
 . fractals  
 . nozzle geometry  
 . specimen geometry  
 . tank geometry  
 . topology  
 . . fixed points (mathematics)  
 . . homotopy theory  
 . . imbeddings (mathematics)  
 . . . invariant imbeddings  
 . . links (mathematics)  
 . . metric space  
 . . . Hilbert space  
 . . . . Sobolev space  
 . . vector analysis  
 . . collinearity  
 . . coplanarity  
 . . curl (vectors)  
 . . . vorticity  
 RT analysis (mathematics)  
 area  
 bodies of revolution  
 complex numbers  
 congruences  
 coordinates  
 ∞ cross sections  
 crystal lattices  
 diagrams  
 diameters  
 dimensions  
 distance  
 foci  
 frustums  
 geoids  
 geometrical acoustics  
 hypergeometric functions  
 hyperspheres  
 infinity  
 ∞ mathematics  
 ∞ measurement  
 planforms  
 Poincare spheres  
 position (location)  
 ∞ profiles  
 reciprocal theorems  
 ∞ science  
 shapes  
 sides  
 spheres  
 ∞ surface geometry  
 surveys  
 symmetry  
 toroids  
 uniqueness theorem

Venn diagrams  
 volume  
 Voronoi diagrams

**geomorphology**

DEF A science that deals with the land and submarine relief features of the Earth's surface and genetic interpretation of them through using the principles of physiography in its descriptive aspects and of dynamic and structural geology in its explanatory phases. Used for physiography.

UF *physiography*  
 GS geology  
 . **geomorphology**  
 morphology  
 . **geomorphology**  
 RT cones (volcanoes)  
 contours  
 geodynamics  
 geographic distribution  
 geography  
 glaciology  
 isostasy  
 lunar geology  
 mountains  
 orography  
 photogeology  
 shatter cones  
 slumping  
 terrain  
 topography  
 volcanoes  
 volcanology

*Geon (trademark)*

USE **polyvinyl chloride**

**geophysical fluid flow cells**

DEF Apparatus used in model experiments for deep solar convection and Jovian atmospheric circulation for Spacelab 1 and Spacelab 3.

GS payloads  
 . Spacelab payloads  
 . . **geophysical fluid flow cells**  
 RT aerospace environments  
 ∞ cells  
 convective flow  
 fluid flow  
 gas flow  
 investigation  
 Jupiter atmosphere  
 Space Transportation System flights  
 spaceborne experiments  
 Spacelab  
 ∞ test equipment

**geophysical fluids**

DEF General term for the liquids and gases on or in the Earth (from water in all forms, to petroleum and hydrocarbons in liquid and gaseous form, and molten rock material within the Earth).

GS **geophysical fluids**  
 . crude oil  
 . ground water  
 . lava  
 . magma  
 . natural gas  
 . . liquefied natural gas  
 RT Earth core  
 fluid dynamics  
 geothermal resources  
 geothermal technology

**geophysical observatories**

GS observatories  
 . **geophysical observatories**  
 . . OGO  
 . . . EGO  
 . . . OGO-3  
 . . . OGO-5  
 . . . OGO-A  
 . . . POGO  
 . . . . OGO-4  
 . . . . OGO-6  
 . . . . OGO-C  
 . . OSO  
 . . . AOSO

... OSO-1  
 ... OSO-2  
 ... OSO-3  
 ... OSO-4  
 ... OSO-5  
 ... OSO-6  
 ... OSO-7  
 ... OSO-8  
 ... OSO-C  
 RT astronomical observatories  
 geology  
 geophysics

**geophysical satellites**  
 GS artificial satellites  
 . **geophysical satellites**  
 . . Cosmos satellites  
 . . . Cosmos 2 satellite  
 . . . Cosmos 3 satellite  
 . . . Cosmos 5 satellite  
 . . . Cosmos 6 satellite  
 . . . Cosmos 14 satellite  
 . . . Cosmos 44 satellite  
 . . . Cosmos 54 satellite  
 . . . Cosmos 71 satellite  
 . . . Cosmos 110 satellite  
 . . . Cosmos 137 satellite  
 . . . Cosmos 144 satellite  
 . . . Cosmos 149 satellite  
 . . . Cosmos 166 satellite  
 . . . Cosmos 186 satellite  
 . . . Cosmos 188 satellite  
 . . . Cosmos 206 satellite  
 . . . Cosmos 213 satellite  
 . . . Cosmos 224 satellite  
 . . . Cosmos 225 satellite  
 . . . Cosmos 381 satellite  
 . . . Cosmos 954 satellite  
 . . . Cosmos 1129 satellite  
 . . . Intercosmos satellites  
 . . Explorer 6 satellite  
 . . Explorer 10 satellite  
 . . Explorer 12 satellite  
 . . Explorer 45 satellite  
 . . OGO  
 . . . EGO  
 . . . OGO-3  
 . . . OGO-5  
 . . . OGO-A  
 . . . POGO  
 . . . . OGO-4  
 . . . . OGO-6  
 . . . . OGO-C  
 . . OSO  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 . . Polar/GGS spacecraft  
 . . Radiation and Meteoroid satellite  
 . . Sputnik 3 satellite  
 . . Vanguard 3 satellite  
 . . Wind/GGS spacecraft  
 RT Ariel satellites  
 communication satellites  
 EOLE satellites  
 meteorological satellites  
 PEOLE satellites  
 space laboratories  
 unmanned spacecraft  
 Vanguard satellites

**geophysics**  
 DEF The physics of the Earth and its environment, i.e., its solid earth, air, waters, and (by extension) space. Classically, geophysics is concerned with the nature of and physical occurrences at and below the surface of the Earth including, therefore, geology, oceanography, geodesy, seismology, and hydrology. The trend is to extend the scope of geophysics to include meteorology, geomagnetism, astrophysics, and

other sciences concerned with the physical nature of the universe.  
 RT aeronomy  
 astrophysics  
 Chandler wobble  
 continental drift  
 Earth (planet)  
 Earth planetary structure  
 Earth sciences  
 field aligned currents  
 formations  
 geochemistry  
 geochronology  
 geodesy  
 geodynamics  
 geoelectricity  
 geoids  
 geological surveys  
 geology  
 geomagnetism  
 geophysical observatories  
 gravimeters  
 gravimetry  
 heat transmission  
 hydrography  
 hydrology  
 International Geophysical Year  
 International Geosphere-Biosphere program  
 isostasy  
 limnology  
 meteorology  
 Mission to Planet Earth  
 oceanography  
 paleomagnetism  
 petrology  
 ∞ physics  
 plates (tectonics)  
 polar cusps  
 ∞ radiation  
 radioactivity  
 ∞ science  
 seismology  
 stratigraphy  
 structural properties (geology)  
 tectonics  
 theoretical physics  
 tiltmeters  
 topography

**geopotential**  
 DEF The potential energy of a unit mass relative to sea level, numerically equal to the work that would be done in lifting the unit mass from sea level to the height at which the mass is located; commonly expressed in terms of dynamic height or geopotential potential.  
 GS **geopotential**  
 . geopotential height  
 RT Earth gravitation  
 geoelectricity  
 gravitational fields  
 height  
 ∞ potential  
 potential energy

**geopotential height**  
 DEF The height of a given point in the atmosphere in units proportional to the potential energy of unit mass (geopotential) at this height, relative to sea level.  
 GS geopotential  
 . **geopotential height**  
 potential energy  
 . **geopotential height**  
 RT atmospheric pressure  
 Earth atmosphere  
 Earth gravitation  
 geodetic accuracy  
 gravitational fields  
 head (fluid mechanics)  
 scale height

**Geopotential Research Mission**  
 DEF A NASA gravity field mapping mission utilizing the low-low satellite tracking concept to measure the Doppler shift between two coorbiting polar satellites. Used for Gravsat satellites.  
 UF *Gravsat satellites*  
 GS artificial satellites

. scientific satellites  
 . . **Geopotential Research Mission**  
 gravitation  
 gravitational fields

**geopressure**  
 DEF Pressures that exceed the normal hydrostatic pressure of about 0. 465 psi per foot of depth.  
 GS pressure  
 . **geopressure**  
 RT geology  
 geothermal resources  
 geothermal technology  
 pressure gradients

**Georgia**  
 GS nations  
 . United States  
 . . **Georgia**  
 RT Atlanta (GA)  
 Sand Hills Region (GA-NC-SC)

**Georgia (Eurasia)**  
*(added August 1993)*  
 GS nations  
 . **Georgia (Eurasia)**  
 RT Asia  
 Europe

**GEOS 1 satellite**  
 GS artificial satellites  
 . geodetic satellites  
 . . **GEOS 1 satellite**  
 RT active satellites  
 ANNA satellites  
 celestial geodesy  
 Explorer 29 satellite  
 LARGOS satellite  
 PAGEOS satellite

**GEOS 2 satellite**  
 UF *GEOS-B satellite*  
 GS artificial satellites  
 . geodetic satellites  
 . . **GEOS 2 satellite**  
 RT active satellites  
 ANNA satellites  
 celestial geodesy  
 Explorer 36 satellite  
 LARGOS satellite  
 PAGEOS satellite

**GEOS 3 satellite**  
 UF *GEOS-C satellite*  
 GS artificial satellites  
 . geodetic satellites  
 . . **GEOS 3 satellite**  
 RT active satellites  
 ANNA satellites  
 celestial geodesy  
 LARGOS satellite  
 PAGEOS satellite  
 satellite altimetry

**GEOS satellites (ESA)**  
 UF *GEOS satellites (ESRO)*  
 GS artificial satellites  
 . ESA satellites  
 . . **GEOS satellites (ESA)**  
 ESA spacecraft  
 . ESA satellites  
 . . **GEOS satellites (ESA)**  
 RT Earth magnetosphere  
 European space programs  
 Geosari project

*GEOS satellites (ESRO)*  
 USE **GEOS satellites (ESA)**

**Geosari project**  
 DEF Launch of GEOS on second development flight of Ariane launcher into a geostationary elliptical orbit in 1979. The name is derived from a combination of GEOS and Ariane.  
 GS programs  
 . projects  
 . . **Geosari project**  
 RT Ariane launch vehicle  
 European Space Agency

## Geosat satellites

GEOS satellites (ESA)

### Geosat satellites

- GS artificial satellites
  - . geodetic satellites
  - . . **Geosat satellites**
- RT satellite altimetry

### GEOS-B satellite

USE **GEOS 2 satellite**

### GEOS-C satellite

USE **GEOS 3 satellite**

### GEOS-D satellite

DEF Another in a series of the European Space Agency's geostationary scientific satellites launched by NASA for long-term cosmic radiation studies. Used for Geodynamic Experimental Ocean Satellite.

- UF *Geodynamic Experimental Ocean Satellite*
- GS artificial satellites
  - . **GEOS-D satellite**

### geosphere

USE **lithosphere**

### Geostationary Operational Environ Sats

USE **GOES satellites**

### Geostationary Operatl Environ Satellite B

USE **GOES 2**

### geostationary platforms

USE **synchronous platforms**

### geostationary satellites

USE **synchronous satellites**

### geostrophic wind

DEF The horizontal wind velocity for which the coriolis acceleration exactly balances the horizontal pressure force.

- GS wind (meteorology)
  - . winds aloft
  - . . **geostrophic wind**
- RT baroclinic instability
  - baroclinic waves
  - divergence
  - isobars (pressure)
  - sea breeze
  - wind shear

### Geosynchronous Earth Orbital Environments

USE **Earth orbital environments**

### geosynchronous orbits

- GS orbits
  - . Earth orbits
  - . . **geosynchronous orbits**
  - . . spacecraft orbits
  - . . satellite orbits
  - . . . **geosynchronous orbits**
- RT circular orbits
  - equatorial orbits
  - Infrared Astronomy Satellite
  - stationary orbits
  - synchronous platforms
  - twenty-four hour orbits

### geosynclines

DEF Mobile downwarplings of the crust of the Earth, either elongate or basinlike, measured in scores of kilometers, in which sedimentary and igneous rocks accumulate to thicknesses of thousands of meters.

- RT anticlines
  - domes (geology)
- ∞ layers
  - strata
  - stratification
  - stratigraphy
  - synclines

### geotechnical engineering

DEF The science and practice of that part of civil engineering involving the inter-relationship between a geologic environment and the works of man.

- RT foundations

soil mechanics  
structural design criteria  
structural engineering

### geotechnical fabrics

DEF Generic term for a variety of artificial fiber products used in engineering construction of civil works such as embankments. Also called geofabrics, filter cloth, geotextiles and civil engineering fabrics. Used for geofabrics and geotextiles.

- UF *geofabrics*
  - geotextiles*
- RT fabrics
  - soil mechanics

### geotemperature

DEF Internal temperature of the planet Earth. Used for geothermometry.

- UF *geothermometry*
- RT geology
  - geothermal anomalies
  - temperature

### geotextiles

USE **geotechnical fabrics**

### geothermal anomalies

- GS anomalies
  - . **geothermal anomalies**
- RT geotemperature
  - geothermal resources
  - surface temperature
  - thermal mapping

### geothermal energy conversion

- GS energy conversion
  - . **geothermal energy conversion**
- RT clean energy
  - ∞ conversion
  - Earth resources
  - engines
  - geothermal technology
  - heat transfer
  - heat transmission
  - ocean thermal energy conversion
  - renewable energy
  - thermal energy
  - turbines
  - turbogenerators

### geothermal energy extraction

DEF The removal for storage and/or utilization of heat from natural sources within the Earth (hot springs, geysers, hot rocks, etc.)

- GS extraction
  - . **geothermal energy extraction**
- RT energy conversion
  - energy technology
  - geothermal technology
  - heat exchangers
  - heat pumps
  - heat transmission
  - heating
  - turbines
  - turbogenerators
  - water heating

### geothermal energy utilization

DEF Any application of energy derived from sources within the Earth.

- GS renewable energy
  - . **geothermal energy utilization**
  - utilization
  - . **geothermal energy utilization**
- RT cooling
  - ∞ electric power
  - energy storage
  - geothermal technology
  - heat pipes
  - heat storage
  - heating
  - ∞ power plants
  - turbogenerators

### geothermal resources

- GS heat sources
  - . thermal resources
  - . . **geothermal resources**
  - . . . geysers

resources

- . Earth resources
- . . thermal resources
- . . . **geothermal resources**
- . . . . geysers

RT dry heat

- ∞ energy sources
- geophysical fluids
- geopressure
- geothermal anomalies
- heat transmission
- hydrothermal systems
- thermal energy
- thermal mapping
- underwater resources
- volcanoes

### geothermal technology

DEF The gamut of operations involved in the exploration, exploitation, and conversion of energy derived from geothermal sources.

- GS technologies
  - . energy technology
  - . . **geothermal technology**
- RT dry heat
  - exploration
  - geophysical fluids
  - geopressure
  - geothermal energy conversion
  - geothermal energy extraction
  - geothermal energy utilization
  - geysers
  - heat sources
  - heat transfer
  - ocean thermal energy conversion
  - resources
  - thermal resources

### geothermometry

USE **geotemperature**

### geotropism

- GS tropism
  - . **geotropism**
- RT gravitational effects
  - physiological effects
  - plants (botany)

### GEP telescopes

USE **particle telescopes**

### Gerdien arc heaters

USE **arc heating**  
**heating equipment**

### Gerdien condensers

- GS measuring instruments
  - . **Gerdien condensers**
- RT capacitors
  - ion density (concentration)

### geriatrics

- GS medical science
  - . **geriatrics**
- RT aging (biology)
  - gerontology

### German Democratic Republic

USE **East Germany**

### German Infrared Laboratory

DEF A proposed infrared telescope for Spacelab that was discontinued in 1985. It superseded the LIRTS (telescope).

- GS telescopes
  - . spaceborne telescopes
  - . . **German Infrared Laboratory**
- RT payloads
  - space shuttles
  - Spacelab
  - West Germany

### German space program

(added December 1990)

- GS programs
  - . space programs
  - . . European space programs
  - . . . **German space program**
- RT East Germany
  - Germany

- Saenger space transportation system  
West Germany
- germanates**  
GS germanium compounds  
. **germanates**  
. . magnesium germanates
- germanides**  
GS germanium compounds  
. **germanides**  
. . magnesium germanides  
RT germanium alloys
- germanium**  
GS chemical elements  
. metalloids  
. . **germanium**  
. . . germanium isotopes
- germanium alloys**  
GS alloys  
. **germanium alloys**  
RT germanides  
silicon alloys
- germanium antimonides**  
GS antimony compounds  
. antimonides  
. . **germanium antimonides**  
germanium compounds  
. **germanium antimonides**
- germanium chlorides**  
GS germanium compounds  
. **germanium chlorides**  
halogen compounds  
. chlorine compounds  
. . chlorides  
. . . **germanium chlorides**  
. halides  
. . chlorides  
. . . **germanium chlorides**
- germanium compounds**  
GS **germanium compounds**  
. germanates  
. . magnesium germanates  
. germanides  
. . magnesium germanides  
. germanium antimonides  
. germanium chlorides  
. germanium oxides  
. organic germanium compounds  
RT ∞ chemical compounds  
∞ Group 4A compounds  
∞ metal compounds
- germanium diodes**  
UF *germanium rectifiers*  
GS electronic equipment  
. diodes  
. . semiconductor diodes  
. . . **germanium diodes**  
. solid state devices  
. . semiconductor devices  
. . . **germanium diodes**  
rectifiers  
. **germanium diodes**  
RT junction diodes  
transistors
- germanium isotopes**  
GS chemical elements  
. metalloids  
. . germanium  
. . . **germanium isotopes**  
. nuclides  
. . isotopes  
. . . **germanium isotopes**
- germanium oxides**  
GS chalcogenides  
. oxides  
. . **germanium oxides**  
germanium compounds  
. **germanium oxides**
- RT ∞ oxygen compounds
- germanium rectifiers*  
USE **germanium diodes**
- Germany**  
(added December 1990)  
GS nations  
. **Germany**  
RT Central Europe  
East Germany  
Europe  
German space program  
West Germany
- germicides*  
USE **bactericides**
- germination**  
RT crop growth  
growth  
phytotrons  
plant physiology  
viability
- germinators*  
USE **phytotrons**
- gerontology**  
RT age factor  
aging (biology)  
geriatrics  
life span
- GERT**  
UF *graphic evaluation and review techniques*  
RT critical path method  
management  
management analysis  
management methods  
management planning  
∞ methodology  
PERT  
project management
- Gestalt theory**  
RT psychotherapy  
∞ theories
- Get Away Specials (STS)**  
DEF Low-cost, man-independent Space Shuttle experimental payloads.  
GS payloads  
. Space Shuttle payloads  
. . **Get Away Specials (STS)**  
RT OSS-1 payload  
Space Shuttle missions  
spaceborne experiments  
Spacelab  
Spacelab payloads
- GETOL aircraft**  
GS ground effect machines  
. **GETOL aircraft**  
RT ∞ aircraft  
∞ subsonic aircraft  
vertical takeoff aircraft
- getters**  
DEF Materials which are included in a vacuum system or device for removing gas by sorption.  
RT ion pumps  
propargyl groups  
purification  
residual gas  
vacuum  
vapor traps
- geysers**  
GS heat sources  
. thermal resources  
. . geothermal resources  
. . . **geysers**  
resources  
. Earth resources  
. . thermal resources  
. . . geothermal resources  
. . . . **geysers**  
RT anomalous temperature zones
- geothermal technology  
hydrogeology  
hydrothermal systems
- GGG (*garnet*)  
USE **gadolinium-gallium garnet**
- Ghana**  
GS nations  
. **Ghana**  
RT Africa
- ghosts**  
RT distortion  
radar echoes  
radio echoes
- Giacobini-Zinner comet**  
GS celestial bodies  
. comets  
. . **Giacobini-Zinner comet**  
RT Draconid meteoroids  
solar system
- giant stars**  
GS celestial bodies  
. stars  
. . **giant stars**  
. . . asymptotic giant branch stars  
. . . Omicron Ceti star  
. . . red giant stars  
. . . carbon stars  
RT cool stars  
F stars  
G stars  
horizontal branch stars  
K stars  
late stars  
M stars  
main sequence stars  
S stars  
subgiant stars  
supergiant stars
- gibberellins**  
GS plants (botany)  
. fungi  
. . **gibberellins**  
RT hemostatics  
regulators
- Gibbs adsorption equation**  
RT adsorption  
∞ equations  
∞ Gibbs equations  
interfacial tension
- ∞ **Gibbs equations**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ∞ equations  
Gibbs adsorption equation  
Gibbs free energy  
Gibbs-Helmholtz equations  
phase rule
- Gibbs free energy**  
GS heat  
. enthalpy  
. . **Gibbs free energy**  
thermodynamic properties  
. enthalpy  
. . **Gibbs free energy**  
. free energy  
. . **Gibbs free energy**  
RT ∞ Gibbs equations  
Gibbs-Helmholtz equations  
Mayer problem
- Gibbs phenomenon**  
RT discontinuity  
Fourier series  
series (mathematics)
- Gibbs-Helmholtz equations**  
RT electric potential  
enthalpy  
∞ equations  
free energy  
∞ Gibbs equations

## Gibraltar

Gibbs free energy  
internal energy  
pressure  
temperature

### Gibraltar

(added February 1992)

GS nations  
. United Kingdom  
. . Gibraltar

RT Europe  
Mediterranean Sea  
Spain  
straits

### gimballess inertial navigation

GS navigation  
. inertial navigation  
. . gimballess inertial navigation

RT gyroscopes  
inertial platforms  
navigation instruments

### gimbals

DEF Devices with two mutually perpendicular and intersecting axes of rotation, thus giving free angular movement in two directions, on which engines or other objects may be mounted. In gyros, supports which provide the spin axes with degrees of freedom.

RT bearings  
control moment gyroscopes  
fluid rotor gyroscopes  
gyrodampers  
gyroscopes  
pivots  
stabilized platforms  
supports  
swivels

### Ginga satellite

(added June 1992)

GS artificial satellites  
. scientific satellites  
. . astronomical satellites  
. . . Ginga satellite  
Japanese spacecraft  
. Ginga satellite  
observatories  
. astronomical observatories  
. . astronomical satellites  
. . . Ginga satellite

RT Japanese space program  
x ray astronomy  
x ray spectra  
x ray stars

### Giotto mission

DEF The European Space Agency's mission to fly through the head of Halley's Comet in order to make in situ measurements of the composition and physical state as well as the structures of the head. Included in the onboard equipment are cameras to determine the structures, spectrometers to determine the composition, and a plasma detector and a magnetometer to measure the interactions with the solar wind. The time of encounter with the comet was during the second week of March 1986.

GS ESA spacecraft  
. Giotto mission  
space missions  
. flyby missions  
. . Giotto mission  
unmanned spacecraft  
. space probes  
. . Giotto mission

RT Halley's comet

### girder webs

GS structural members  
. plates (structural members)  
. . girder webs  
webs (supports)  
. girder webs

RT elastic sheets  
girders

metal plates

### girders

GS structural members  
. girders

RT beams (supports)  
box beams  
girder webs  
plates (structural members)  
trusses

### girdles

RT ∞ belts  
pelvis

### glacial drift

DEF A general term for drift transported by glaciers or icebergs and deposited directly on land or in seas. Used for drumlins, end moraines, eskers, glaciofluvial deposits, moraines, and Stoss-and-Lee topography.

UF *drumlins*  
*end moraines*  
*eskers*  
*glaciofluvial deposits*  
*moraines*  
*Stoss-and-Lee topography*

RT debris  
glaciers  
kettles (geology)  
land ice  
landforms  
sea ice  
sediments

### glaciers

DEF Large masses of ice formed, at least in part, on land by the compaction and recrystallization of snow, moving slowly by creeping downslope or outward in all directions due to the stress of their own weight, and surviving from year to year. Included are small mountain glaciers as well as ice sheets continental in size, and ice shelves which float on oceans but are fed in part by ice formed on land. Used for active glaciers and advancing glaciers.

UF *active glaciers*  
*advancing glaciers*

GS crevasses  
. glaciers  
ice  
. glaciers  
resources  
. Earth resources  
. . glaciers

RT cirques (landforms)  
glacial drift  
glaciology  
land ice  
sea ice

### glaciofluvial deposits

USE **glacial drift**

### glaciology

DEF The study of all aspects of snow and ice; the science that treats quantitatively the whole range of processes associated with all forms of solid existing water.

GS geology  
. glaciology

RT geomorphology  
glaciers  
hydrogeology  
isostasy

### ∞ glands

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT glands (anatomy)  
glands (seals)  
pump seals

### glands (anatomy)

GS anatomy  
. glands (anatomy)  
. . endocrine glands  
. . . adrenal gland  
. . . gonads  
. . . ovaries

. . . testes  
. . . hypothalamus  
. . . pancreas  
. . . parathyroid gland  
. . . pineal gland  
. . . pituitary gland  
. . . thymus gland  
. . . thyroid gland  
. . . mammary glands  
. . . salivary glands  
. . . sebaceous glands  
. . . sex glands  
. . . gonads  
. . . ovaries  
. . . testes  
. . . prostate gland

RT endocrine systems  
gastrointestinal system

∞ glands  
liver  
organs  
secretions

### glands (seals)

GS seals (stoppers)  
. glands (seals)

RT ∞ glands  
labyrinth seals  
O ring seals  
packings (seals)  
pump seals  
sealing

### glare

DEF A condition of vision in which there is discomfort or a reduction in ability to see details, objects, or both, caused by an unsuitable distribution or range of luminance, or by extreme conditions in space.

RT brightness  
comfort  
dayglow  
electromagnetic radiation  
human factors engineering  
illuminating  
light (visible radiation)  
luminance  
luster  
optical properties  
radiance  
sky brightness  
specular reflection  
spread reflection  
visibility  
vision

### glass

GS **glass**  
. borosilicate glass  
. E glass  
. . S glass  
. glass fibers  
. metallic glasses  
. obsidian glass  
. Pyroceram (trademark)  
. silica glass  
. spin glass  
. Vycor

RT amorphous materials  
ceramics  
electrostatic bonding  
glass transition temperature  
glassware  
glassy carbon  
Griffith crack

∞ materials  
moldavite  
obsidian  
optical coatings  
optical materials  
optical properties  
photographic plates  
porcelain  
silicon dioxide  
vitreous materials  
vitrification

### glass coatings

SN (COATINGS CONSISTING OF GLASS)  
GS coatings

- . **glass coatings**
- RT glazes
- metallic glasses
- protective coatings
- silica glass
- glass electrodes**
- GS electrodes
- . **glass electrodes**
- RT electrochemistry
- ion exchanging
- silica glass
- glass fiber reinforced plastics**
- GS composite materials
- . fiber composites
- . . **glass fiber reinforced plastics**
- . polymer matrix composites
- . . reinforced plastics
- . . . **glass fiber reinforced plastics**
- plastics
- . reinforced plastics
- . . **glass fiber reinforced plastics**
- RT airframe materials
- composite structures
- E glass
- fiber orientation
- fibers
- laminates
- plastic aircraft structures
- pultrusion
- reinforcing fibers
- S glass
- thermoplastic resins
- thermosetting resins
- woven composites
- glass fibers**
- UF *fiberglass*
- GS fibers
- . synthetic fibers
- . . **glass fibers**
- glass
- . **glass fibers**
- optical materials
- . **glass fibers**
- RT boron fibers
- E glass
- gradient index optics
- metallic glasses
- optical fibers
- plastic fibers
- reinforcing fibers
- S glass
- silica glass
- Vycor
- glass lasers**
- DEF High power lasers used in laser fusion technology research.
- GS stimulated emission devices
- . lasers
- . . **glass lasers**
- RT high power lasers
- laser fusion
- laser outputs
- laser plasma interactions
- laser targets
- neodymium lasers
- optical pumping
- pulsed lasers
- ultrashort pulsed lasers
- glass transition temperature**
- GS temperature
- . **glass transition temperature**
- RT curing
- epoxy resins
- glass
- polymer chemistry
- polymer physics
- temperature effects
- transition temperature
- glassware**
- RT borosilicate glass
- bottles
- burettes
- ∞ containers
- flasks
- glass
- laboratory equipment
- pipettes
- silica glass
- glassy carbon**
- DEF Form of carbon with unique properties and characteristics. Formed by carbonizing phenolic resins made by reacting phenols with celulosics, aldehydes, and ketones.
- GS composite materials
- . **glassy carbon**
- RT carbon
- glass
- ∞ materials
- GLAST*
- (added August 2008)
- USE **Fermi Gamma-ray Space Telescope**
- Glauber theory**
- RT approximation
- elastic scattering
- Pomeranchuk theorem
- ∞ theories
- glaucoma**
- GS diseases
- . eye diseases
- . . **glaucoma**
- RT intraocular pressure
- Glauert coefficient*
- USE **aerodynamic forces**
- Mach number**
- glazes**
- GS coatings
- . **glazes**
- finishes
- . **glazes**
- RT ceramics
- frit
- glass coatings
- porcelain
- protective coatings
- glide angles*
- USE **glide paths**
- glide landings**
- GS landing
- . **glide landings**
- . . horizontal spacecraft landing
- RT aircraft landing
- crash landing
- ditching (landing)
- planetary landing
- soft landing
- spacecraft landing
- water landing
- glide paths**
- DEF Flight paths of aeronautical vehicles in a glide, seen from the side. The paths used by aircraft or spacecraft in approach procedure and which are generated by instrument landing facilities. Used for glide angles and glide slopes.
- UF *glide angles*
- glide slopes*
- GS flight paths
- . **glide paths**
- slopes
- . **glide paths**
- RT aircraft approach spacing
- approach control
- approach indicators
- gliding
- instrument approach
- instrument landing systems
- terminal guidance
- glide slopes*
- USE **glide paths**
- gliders**
- DEF A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surface and whose free flight does not depend principally on an engine.
- UF *sailplanes*
- GS **gliders**
- . ASSET gliders
- . boostglide vehicles
- . . X-20 aircraft
- . hang gliders
- . HL-10 reentry vehicle
- . hypersonic gliders
- . . X-20 aircraft
- . Janus spacecraft
- . paragliders
- . . inflatable gliders
- RT aerospace planes
- ∞ aircraft
- flexible wings
- free flight
- gliding
- lifting reentry vehicles
- ∞ military aircraft
- monoplanes
- observation aircraft
- sails
- sailwings
- Schleicher aircraft
- soaring
- ∞ subsonic aircraft
- towed bodies
- ∞ winged vehicles
- gliding**
- RT boostglide vehicles
- descent
- ∞ flight
- flight paths
- free flight
- glide paths
- gliders
- lift
- ∞ motion
- soaring
- Glimm method**
- DEF Numerical technique for solving gas dynamics problems involving hyperbolic systems of conservation laws.
- GS analysis (mathematics)
- . numerical analysis
- . . **Glimm method**
- procedures
- . **Glimm method**
- RT ∞ equations
- fluid dynamics
- ∞ methodology
- glint**
- RT angels (radar)
- radar echoes
- scintillation
- global air pollution**
- GS pollution
- . environment pollution
- . . air pollution
- . . . **global air pollution**
- RT Earth atmosphere
- environments
- global warming
- pollution monitoring
- pollution transport
- Global Air Sampling Program**
- UF *GASP*
- RT air pollution
- air sampling
- environmental quality
- sampling
- Global Atmospheric Research Program**
- UF *GARP*
- GS programs
- . **Global Atmospheric Research Program**
- . . GARP Atlantic Tropical Experiment
- RT aerology
- integrated global ocean station
- systems
- meteorology
- NASA programs
- weather



# Global Positioning System

weather reconnaissance aircraft

*Global Communications Antenna Grid (navy)*  
USE **Seafarer project**

*Global Orbiting Navigation Satellite Sys.*  
USE **GLONASS**

## Global Positioning System

DEF A satellite navigation system which will display many (up to 24) satellites in three sets of orbits by means of a precise time standard and three-dimensional information on position and velocity.

GS satellite navigation systems  
. **Global Positioning System**  
RT autonomous spacecraft clocks  
flight paths  
GLONASS  
navigation  
orbit determination  
position indicators  
positioning  
satellite constellations  
space navigation  
∞ systems  
time synchronization

## Global Tracking Network

UF *GLOTRAC (tracking network)*  
GS networks  
. tracking networks  
. . **Global Tracking Network**  
stations  
. tracking stations  
. . **Global Tracking Network**  
RT data acquisition  
ground stations  
minitrack system  
NASCOM network  
optical tracking  
radio relay systems  
range and range rate tracking  
satellite tracking  
Space Flight Tracking and Data  
Network  
STDN (network)

## global warming

(*added December 1989*)  
GS heating  
. atmospheric heating  
. . **global warming**  
RT atmospheric temperature  
CLARREO (observatory)  
climate change  
global air pollution  
Glory Mission satellite  
greenhouse effect  
Mission to Planet Earth  
radiative forcing  
stratospheric warming

## ∞ globes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT Earth (planet)  
luminaires  
maps  
spheres

## globular clusters

GS celestial bodies  
. star clusters  
. . **globular clusters**  
RT ∞ clusters  
color-magnitude diagram  
galactic halos  
horizontal branch stars  
metallicity  
Population II stars  
star distribution

## globules

RT falling spheres  
interfacial tension  
liquids  
microballoons

spheres

## globulins

GS biopolymers  
. proteins  
. . **globulins**  
. . . fibrinogen  
. . . gamma globulin  
organic compounds  
. proteins  
. . **globulins**  
. . . fibrinogen  
. . . gamma globulin

## glomerulus

GS anatomy  
. circulatory system  
. . cardiovascular system  
. . . blood vessels  
. . . . capillaries (anatomy)  
. . . . . **glomerulus**  
. genitourinary system  
. . kidneys  
. . . **glomerulus**  
RT renal function

## GLONASS

(*added September 1994*)  
UF *Global Orbiting Navigation Satellite Sys.*  
GS satellite navigation systems  
. **GLONASS**  
RT Global Positioning System  
international cooperation  
positioning  
Russian Space Program  
U.S.S.R. space program

## Glory Mission satellite

(*added July 2006*)  
DEF A low Earth orbit (LEO) scientific research satellite designed to collect data on the properties of aerosols and black carbon in the Earth's atmosphere and climate system; and collect data on solar irradiance for the long-term effects on the Earth climate record.

GS artificial satellites  
. scientific satellites  
. . **Glory Mission satellite**  
observatories  
. **Glory Mission satellite**  
RT aerosols  
climate change  
climatology  
global warming  
satellite observation  
soot

## glossaries

USE **dictionaries**

*Gloster GA-5 aircraft*

USE **GA-5 aircraft**

*GLOTRAC (tracking network)*

USE **Global Tracking Network**

## glottis

GS anatomy  
. respiratory system  
. . larynx  
. . . **glottis**  
RT vocal cords

## gloveboxes

(*added April 2009*)  
DEF Sealed containers with attached gloves allowing object manipulation in a controlled and separate environment, thereby preventing object contamination and protecting the user from hazard or injury.

GS laboratory equipment  
. **gloveboxes**  
RT spaceborne experiments

## gloves

GS clothing  
. **gloves**

RT protective clothing

## glow

USE **luminescence**

## glow discharges

DEF Electrical discharges that produce luminosity.  
GS electric current  
. electric discharges  
. . **glow discharges**  
RT cathode glow  
electric arcs  
electric corona  
electrodeless discharges  
Faraday dark space  
gas discharges  
light sources  
plasma display devices  
plasma radiation

## glucocorticoids

(*added December 1999*)

DEF Adrenocortical steroid hormones that are involved in the metabolism of fats, proteins, and carbohydrates, and have anti-inflammatory properties.

GS organic compounds  
. lipids  
. . steroids  
. . . corticosteroids  
. . . . **glucocorticoids**  
secretions  
. endocrine secretions  
. . hormones  
. . . corticosteroids  
. . . . **glucocorticoids**  
RT adrenal gland  
atrophy  
carbohydrate metabolism  
hormone metabolisms  
hypokinesia  
lipid metabolism  
muscles  
protein metabolism

## glucose

GS organic compounds  
. carbohydrates  
. . sugars  
. . . monosaccharides  
. . . . hexoses  
. . . . . **glucose**

## glucosides

UF *glycosides*  
GS organic compounds  
. carbohydrates  
. . **glucosides**  
. . . nucleosides  
. . . . adenines  
. . . . . guanosines

## glues

GS adhesives  
. **glues**  
RT pastes  
sizing materials  
tetraethyl orthosilicate

## gluons

DEF The carriers of the strong force which holds atomic nuclei together (holding together groups of quarks making up stable particles, which in turn are bound together in the atomic nuclei).

GS particles  
. elementary particles  
. . hypothetical particles  
. . . **gluons**  
RT leptons  
mesons  
quantum chromodynamics  
quarks

## glutamates

GS esters  
. **glutamates**

RT glutamic acid

### glutamic acid

GS acids  
 . amino acids  
 . . **glutamic acid**  
 organic compounds  
 . amino acids  
 . . **glutamic acid**

RT glutamates

### glutamine

GS acids  
 . amino acids  
 . . **glutamine**  
 organic compounds  
 . amino acids  
 . . **glutamine**

### glutathione

GS organic compounds  
 . coenzymes  
 . . **glutathione**  
 . peptides  
 . . polypeptides  
 . . . **glutathione**

### glycerides

GS esters  
 . **glycerides**  
 RT glycerols  
 nitroglycerin

### glycerins

USE **glycerols**

### glycerols

UF *glycerins*  
 RT alcohols  
 carbohydrates  
 glycerides  
 lipids  
 liquids  
 nitroglycerin  
 triacetin

### glycidyl azide polymer

(added August 1990)  
 UF *GAP (propellants)*  
 RT  $\infty$  polymers  
 propellant binders  
 solid rocket binders

### glycine

GS acids  
 . amino acids  
 . . **glycine**  
 organic compounds  
 . amino acids  
 . . **glycine**

### glycogens

GS biopolymers  
 . polysaccharides  
 . . **glycogens**  
 organic compounds  
 . carbohydrates  
 . . polysaccharides  
 . . . **glycogens**

### glycols

GS hydroxyl compounds  
 . alcohols  
 . . **glycols**  
 RT hydroxyl radicals

### glycolysis

GS chemical reactions  
 . **glycolysis**  
 decomposition  
 . **glycolysis**

### glycosides

USE **glucosides**

### gneiss

DEF A foliated rock formed by regional metamorphism, in which bands or lenticles of granular materials alternate with bands or lenticles in which minerals having flaky or elongate prismatic habits predominate. Generally less

than 50 percent of the minerals show preferred parallel orientation. Although a gneiss is commonly feldspar- and quartz-rich, the mineral composition is not an essential factor in its definition.

GS rocks  
 . **gneiss**  
 RT soils

### gnomonic projection

DEF A projection on a plane tangent to the surface of a sphere having the point of projection at the center of the sphere. Used in cartography and in crystallography.

RT photomapping  
 $\infty$  projection  
 projective geometry

### gnotobiotics

DEF The study of germ free animals.

RT bacteria  
 bacteriology  
 closed ecological systems  
 controlled atmospheres  
 isolation  
 microbiology  
 microorganisms  
 sterilization

### GNP

USE **gross national product**

### goal theory

RT goals  
 $\infty$  theories

### goals

RT achievement  
 engineering management  
 goal theory  
 project planning  
 purposes  
 research management

### goats

GS animals  
 . vertebrates  
 . . mammals  
 . . . **goats**  
 RT grazing  
 livestock

### Gobi desert

GS land  
 . deserts  
 . . **Gobi desert**  
 RT arid lands  
 desertification

### Goddard experiment package telescope

USE **particle telescopes**

### Goddard Trajectory Determination System

UF *GTDS*  
 RT computer programs  
 interplanetary trajectories  
 moon-Earth trajectories  
 orbit calculation  
 orbital mechanics  
 orbital position estimation  
 spacecraft trajectories  
 $\infty$  systems  
 trajectory analysis  
 trajectory optimization

### Godunov method

(added February 1998)

DEF Non-oscillatory finite-volume scheme that incorporates the exact or approximate solution to the Riemann initial-value problem, or a generalization of it.

GS analysis (mathematics)  
 . numerical analysis  
 . . finite volume method  
 . . . **Godunov method**  
 procedures  
 . finite volume method  
 . . **Godunov method**  
 RT approximation  
 Cauchy problem

Cauchy-Riemann equations  
 computational fluid dynamics  
 Euler equations of motion  
 finite difference theory  
 shock wave interaction  
 supersonic flow

### Goertler instability

DEF Counter-rotating ring vortices formed in the annulus between two cylinders rotating with respect to each other.

UF *Taylor-Goertler instability*  
 GS dynamic characteristics  
 . dynamic stability  
 . . motion stability  
 . . . flow stability  
 . . . . **Goertler instability**  
 . flow characteristics  
 . . flow stability  
 . . . **Goertler instability**  
 stability  
 . dynamic stability  
 . . motion stability  
 . . . flow stability  
 . . . . **Goertler instability**

RT boundary layer stability  
 boundary layer transition  
 centrifugal force  
 laminar boundary layer  
 rotating fluids  
 rotating liquids  
 Taylor instability  
 vortices  
 wall flow

### GOES 1

DEF The first in a series of geostationary operational environmental satellites launched in October 1975. It ceased operation in June of 1977.

GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 1**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 1**  
 RT meteorological satellites

### GOES 2

DEF The second in a series of geostationary operational environmental satellites launched in June 1977. Used for Geostationary Operatl Environ Satellite B.

UF *Geostationary Operatl Environ Satellite B*  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 2**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 2**  
 RT meteorological satellites  
 SMS 1  
 SMS 2

### GOES 3

DEF The third in a series of geostationary operational environmental satellites launched in June 1978.

GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 3**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 3**  
 RT meteorological satellites

### GOES 4

DEF The fourth in a series of geostationary operational environmental satellites launched in September 1980.

GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 4**  
 . synchronous satellites  
 . . GOES satellites

## GOES 5

... **GOES 4**  
 RT meteorological satellites

**GOES 5**  
 DEF The fifth in a series of geostationary operational environmental satellites launched in May 1981.  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 5**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 5**  
 RT meteorological satellites

**GOES 6**  
 DEF The sixth in a series of geostationary operational environmental satellites launched in April 1983.  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 6**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 6**

**GOES 7**  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 7**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 7**

**GOES 8**  
*(added July 1995)*  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 8**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 8**

**GOES 9**  
*(added July 1995)*  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 9**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 9**

**GOES 10**  
*(added March 2000)*  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 10**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 10**

**GOES 13**  
*(added August 2005)*  
 DEF A joint NASA/NOAA satellite launched on August 15, 2005 for radiometric imagery, atmospheric sounding, and space weather monitoring.  
 UF *GOES N*  
 GS artificial satellites  
 . meteorological satellites  
 . . GOES satellites  
 . . . **GOES 13**  
 . synchronous satellites  
 . . GOES satellites  
 . . . **GOES 13**  
 RT marine meteorology  
 space weather

storms (meteorology)

*GOES N*  
*(added August 2005)*  
 USE **GOES 13**

**GOES satellites**  
 DEF Geostationary operational environmental satellites. Used for Geostationary Operational Environ Sats.  
 UF *Geostationary Operational Environ Sats*  
 GS artificial satellites  
 . meteorological satellites  
 . . **GOES satellites**  
 . . . GOES 1  
 . . . GOES 2  
 . . . GOES 3  
 . . . GOES 4  
 . . . GOES 5  
 . . . GOES 6  
 . . . GOES 7  
 . . . GOES 8  
 . . . GOES 9  
 . . . GOES 10  
 . . . GOES 13  
 . synchronous satellites  
 . . **GOES satellites**  
 . . . GOES 1  
 . . . GOES 2  
 . . . GOES 3  
 . . . GOES 4  
 . . . GOES 5  
 . . . GOES 6  
 . . . GOES 7  
 . . . GOES 8  
 . . . GOES 9  
 . . . GOES 10  
 . . . GOES 13  
 RT ISCCP Project

**goggles**  
 GS clothing  
 . **goggles**  
 RT eye protection  
 flight clothing  
 helmets  
 protective clothing  
 sunglasses

**Golay detector cells**  
 GS measuring instruments  
 . radiation measuring instruments  
 . . radiation detectors  
 . . . **Golay detector cells**  
 RT energy absorption films  
 pneumatic equipment  
 radiation absorption

**gold**  
 GS chemical elements  
 . **gold**  
 . . gold isotopes  
 . . . gold 198  
 metals  
 . noble metals  
 . . **gold**  
 . . . gold isotopes  
 . . . . gold 198  
 . transition metals  
 . . **gold**  
 . . . gold isotopes  
 . . . . gold 198

**gold 198**  
 GS chemical elements  
 . gold  
 . . gold isotopes  
 . . . **gold 198**  
 . nuclides  
 . . isotopes  
 . . . gold isotopes  
 . . . . **gold 198**  
 . . . radioactive isotopes  
 . . . . **gold 198**  
 metals  
 . noble metals  
 . . gold  
 . . . gold isotopes  
 . . . . gold 198

. transition metals  
 . . gold  
 . . . gold isotopes  
 . . . . **gold 198**

**gold alloys**  
 GS alloys  
 . **gold alloys**  
 RT copper alloys  
 nickel alloys  
 silver alloys

**gold coatings**  
 UF *gold plate*  
 GS coatings  
 . metal coatings  
 . . **gold coatings**  
 RT nickel plate  
 protective coatings

**gold isotopes**  
 GS chemical elements  
 . gold  
 . . **gold isotopes**  
 . . . gold 198  
 . nuclides  
 . . isotopes  
 . . . **gold isotopes**  
 . . . . gold 198  
 metals  
 . noble metals  
 . . gold  
 . . . **gold isotopes**  
 . . . . gold 198  
 . transition metals  
 . . gold  
 . . . **gold isotopes**  
 . . . . gold 198  
 RT radioactive isotopes

*gold plate*  
 USE **gold coatings**

**Gompertz curves**  
 GS charts  
 . graphs (charts)  
 . . **Gompertz curves**  
 geometry  
 . curves (geometry)  
 . . S curves  
 . . . **Gompertz curves**  
 . Euclidean geometry  
 . . analytic geometry  
 . . . S curves  
 . . . . **Gompertz curves**

**gonads**  
 GS anatomy  
 . genitourinary system  
 . . reproductive systems  
 . . . sex glands  
 . . . . **gonads**  
 . . . . . ovaries  
 . . . . . testes  
 . . glands (anatomy)  
 . . endocrine glands  
 . . . **gonads**  
 . . . . ovaries  
 . . . . testes  
 . . sex glands  
 . . . **gonads**  
 . . . . ovaries  
 . . . . testes  
 RT physiological effects

**gondolas**  
 RT aircraft compartments  
 airships  
 balloons  
 baskets

**goniometers**  
 DEF Instruments for measuring angles.  
 GS measuring instruments  
 . **goniometers**  
 . . photogoniometers  
 . . radiogoniometers  
 RT angles (geometry)  
 diffractometers  
 etalons

interferometers  
 Mach-Zehnder interferometers  
 monochromators  
 optical measuring instruments  
 refractometers  
 spectrometers

**goodness of fit**  
 DEF The degree to which the observed frequencies of occurrence of events in an experiment correspond to the probabilities in a model of the experiment.  
 GS statistical analysis  
 . **goodness of fit**  
 RT fitting  
 mathematical models  
 maximum likelihood estimates  
 probability distribution functions  
 probability theory  
 statistical distributions  
 statistical tests  
 variance (statistics)

**gores**  
 RT fabrics  
 parachute fabrics

*gorges*  
 USE **canyons**

*GOSS (support system)*  
 USE **ground operational support system**

**government procurement**  
 GS procurement  
 . **government procurement**  
 RT commercial off-the-shelf products  
 commodities  
 contracts  
 federal budgets  
 services

**government/industry relations**  
 RT commerce lab  
 commercialization  
 contract negotiation  
 contractors  
 contracts  
 procurement

**governments**  
 RT constitution  
 culture (social sciences)  
 policies  
 politics  
 regimes  
 voting

*governors*  
 USE **speed regulators**

*GPHS (nucleonics)*  
 (added December 2002)  
 USE **radioisotope heat sources**

*grabens*  
 USE **geological faults**

**GRACE mission**  
 (added August 2008)  
 DEF The second mission under the NASA Earth System Science Pathfinder (ESSP) Program which maps variations in the Earth's gravity field. The mission includes two identical spacecrafts flying about 200 kilometers apart in a polar orbit 500 kilometers above the Earth.  
 UF *Gravity Recovery and Climate Experiment mission*  
 GS space missions  
 . **GRACE mission**  
 RT climate change  
 Earth atmosphere  
 Earth gravitation  
 geoids  
 GRAIL mission  
 gravitational fields  
 remote sensing

satellite observation

∞ **grade**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT angles (geometry)  
 gradients  
 level (horizontal)  
 position (title)  
 quality  
 slopes

*graded index optics*  
 USE **gradient index optics**

*gradient index devices*  
 USE **gradient index optics**

**gradient index optics**  
 DEF Optical systems with components whose refractive indexes vary continuously within the material used for the optical elements.  
 UF *graded index optics*  
*gradient index devices*  
*GRIN (optics)*  
 RT fiber optics  
 geometrical optics  
 glass fibers  
 lens design  
 lenses  
 nonlinear optics  
 optical properties  
 ∞ optics  
 physical optics  
 ray tracing  
 refractivity

**gradients**  
 GS **gradients**  
 . electron density profiles  
 . potential gradients  
 . pressure gradients  
 . temperature gradients  
 . . thermoclines  
 RT angles (geometry)  
 composition (property)  
 conjugate gradient method  
 ∞ cross sections  
 differences  
 distribution (property)  
 ∞ drop  
 ∞ grade  
 gravity gradiometers  
 isobars (pressure)  
 isotherms  
 level (horizontal)  
 optimization  
 ∞ profiles  
 slopes  
 variations  
 vector analysis

∞ **gradiometers**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT gravity gradiometers  
 magnetometers

*graduation*  
 USE **calibrating**

**Graeff calculus**  
 GS analysis (mathematics)  
 . calculus  
 . . **Graeff calculus**  
 . numerical analysis  
 . . **Graeff calculus**

**grafting**  
 RT implantation  
 insertion

**GRAIL mission**  
 (added June 2010)  
 DEF Mission selected through NASA's Discovery Program that will use a pair of spacecraft to conduct high-quality gravity field mapping of the Moon. Primary science objectives are to determine the structure of the lunar interior from crust to core, and to advance understanding of

the thermal evolution of the Moon. As a secondary objective, GRAIL will extend knowledge gained from the Moon to the other terrestrial planets.  
 UF *Gravity Recovery and Interior Laboratory*  
 GS space missions  
 . **GRAIL mission**  
 RT GRACE mission  
 gravitational fields  
 lunar evolution  
 lunar geology  
 lunar gravitation  
 lunar mantle  
 planetary structure

**grain boundaries**  
 GS boundaries  
 . **grain boundaries**  
 RT antiphase boundaries  
 crystal dislocations  
 embedded atom method  
 grain size  
 intergranular corrosion  
 interstices  
 interstitials  
 precipitates  
 transgranular corrosion  
 twinning

*grain bridging*  
 USE **crack bridging**

**grain formation**  
 (added June 2005)  
 SN (EXCLUDES FOOD--LIMITED TO MATERIALS AND PARTICULATES)  
 RT ∞ grains  
 granular materials  
 nucleation  
 particulates

**grain size**  
 GS size (dimensions)  
 . **grain size**  
 RT grain boundaries  
 metal fatigue  
 microstructure  
 nanocomposites  
 nanocrystals  
 nanostructure (characteristics)  
 Ostwald ripening  
 particle size distribution

∞ **grains**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT crystals  
 grain formation  
 grains (food)  
 granular materials  
 particles  
 propellant grains

**grains (food)**  
 GS farm crops  
 . **grains (food)**  
 . . barley  
 . . corn  
 . . millet  
 . . oats  
 . . rice  
 . . sorghum  
 . . wheat  
 RT angiosperms  
 Earth resources  
 ∞ grains  
 grasses  
 seeds

**grammars**  
 RT languages  
 parsing algorithms  
 semantics  
 syntax  
 vowels  
 words (language)

**Granat satellite**  
 (added April 1995)

## Grand Canyon (AZ)

- GS artificial satellites
  - . Soviet satellites
  - . . **Granat satellite**
- RT French space program
  - gamma ray astronomy
  - international cooperation
  - Mir space station
  - Russian Space Program
  - spaceborne astronomy
  - x ray astronomy

### Grand Canyon (AZ)

- GS landforms
  - . canyons
  - . . **Grand Canyon (AZ)**
- RT Arizona

### Grand Tours

- UF *outer planet missions*
- GS space missions
  - . flyby missions
  - . . **Grand Tours**
  - . . . Mariner Jupiter-Saturn flyby
  - . . . Mariner Jupiter-Uranus flyby
  - . . . Voyager 1977 mission
- RT  $\infty$  missions
  - outer planets explorers
  - space flight
  - Voyager 1 spacecraft
  - Voyager 2 spacecraft

### grand unified theory

- DEF A theory describing the unification of gravity with the other elementary forces in physics, i.e., the weak force, the strong force and the electromagnetic force. Used for GUT.
- UF *GUT*
- GS field theory (physics)
  - . **grand unified theory**
- RT astrophysics
  - big bang cosmology
  - broken symmetry
  - cosmology
  - Einstein equations
  - electromagnetic fields
  - electromagnetic interactions
  - electromagnetism
  - gravitation theory
  - gravitational fields
  - particle theory
  - plasma physics
  - relativity
  - string theory
  - strong interactions (field theory)
  - supersymmetry
  - symmetry
  - theoretical physics
  - weak energy interactions
  - weak interactions (field theory)

### granite

- GS rocks
  - . igneous rocks
  - . . **granite**
- RT batholiths
  - Earth resources
  - soils

### grants

- DEF Assets bestowed or transferred, such as money or land, for a particular purpose.
- RT appropriations
  - budgeting
  - contracts
  - insurance (contracts)
  - NASA programs
  - patents
  - subcontracts

### granular materials

- RT brittle materials
  - grain formation
- $\infty$  grains
  - low density materials
- $\infty$  materials
  - particles
  - pellets

powder (particles)

### graph theory

- DEF The mathematical study of the structure of graphs and networks.
- RT combinatorial analysis
  - graphs (charts)
  - greedy algorithms
  - mathematical models
- $\infty$  nets
  - set theory
- $\infty$  theories
  - topology
  - trees (mathematics)

### graphene

- (*added April 2011*)
- DEF A single-layer sheet of carbon atoms with a single (0001) basal plane graphite structure; a building block for graphitic materials of other dimensionalities.
- GS nanostructures (devices)
  - . **graphene**
- RT carbon
  - carbon nanotubes
  - fullerenes
  - graphite
  - nanotechnology
  - polycyclic aromatic hydrocarbons

### graphic arts

- GS arts
  - . **graphic arts**
  - . . animation
  - . . . computer animation
- RT charts
  - diagrams
  - drafting (drawing)
  - drawings
  - engineering drawings
  - imagery
  - inks
  - motion pictures
  - multimedia
  - photography
- $\infty$  projection

### graphic evaluation and review techniques

- USE **GERT**

### graphical user interface

- (*added July 1993*)
- DEF A man-computer interface which relies on graphical and/or pictorial means for presenting the user with command options and their results. Input to a graphical user interface relies heavily on the use of point-and-click devices (such as a 'mouse'). Most graphical user interfaces are designed to facilitate multitasking through separate application windows (computer programs).
- UF *GUI (computers)*
- GS interfaces
  - . **graphical user interface**
  - . . windows (computer programs)
- RT computer graphics
  - disk operating system (DOS)
  - display devices
  - human-computer interface

### graphite

- GS carbonaceous materials
  - . **graphite**
  - . . pyrolytic graphite
  - minerals
  - . **graphite**
  - . . pyrolytic graphite
- RT aluminum graphite composites
  - buckminsterfullerene
  - carbon
  - carbon nanotubes
  - electrodes
  - fiber composites
  - fullerenes
  - graphene
  - graphite-epoxy composites
  - intercalation
  - lubricants
  - moderators
  - nanotubes

single crystals  
solid lubricants  
synthetic metals

### graphite-epoxy composites

- DEF Structural materials composed of epoxy resins reinforced with graphite.
- GS composite materials
  - . polymer matrix composites
  - . . epoxy matrix composites
  - . . . **graphite-epoxy composites**
  - . resin matrix composites
  - . . **graphite-epoxy composites**
  - . superhybrid materials
  - . . **graphite-epoxy composites**
- RT braided composites
  - carbon fiber reinforced plastics
- $\infty$  construction materials
  - epoxy resins
  - fiber composites
  - graphite
  - graphite-polyimide composites
- $\infty$  materials
  - reinforced plastics
  - reinforcing fibers
  - sheet molding compounds
  - woven composites

### graphite-polyimide composites

- DEF Composite materials utilizing graphite reinforcing fibers in a resin matrix.
- GS composite materials
  - . polymer matrix composites
  - . . **graphite-polyimide composites**
- RT graphite-epoxy composites

### graphitization

- RT annealing
  - heat treatment

### graphoepitaxy

- DEF The use of artificial surface relief structures to induce crystallographic orientation in thin films.
- RT amorphous materials
  - crystal lattices
  - crystal structure

### graphology

- GS handwriting
  - . **graphology**
  - recognition
  - . pattern recognition
  - . . **graphology**
- RT character recognition

### graphs (charts)

- UF *polarization charts*
- GS charts
  - . **graphs (charts)**
  - . . bond graphs
  - . . Gompertz curves
  - . . Mollier diagram
  - . . Patterson map
- RT conformal mapping
- $\infty$  curves
  - fault trees
  - graph theory
  - histograms
  - nomographs
- $\infty$  origins
  - Petri nets
  - recording instruments
  - representations
  - statistical analysis
  - trees (mathematics)

### Grashof number

- DEF A nondimensional parameter used in the theory of heat transfer. The Grashof number is associated with the Reynolds number and the Prandtl number in the study of convection.
- GS dimensionless numbers
  - . **Grashof number**
  - ratios
  - . **Grashof number**
- RT convection
  - Prandtl number

- Reynolds number
- grasses**  
 GS plants (botany)  
 . **grasses**  
 . . hay  
 . . reeds (plants)  
 . . sea grasses  
 . . sorghum  
 RT alfalfa  
 canopies (vegetation)  
 defoliation  
 farm crops  
 farmlands  
 grains (food)  
 grasslands  
 millet  
 oats  
 sod
- grasshoppers**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **grasshoppers**
- grasslands**  
 UF *grazing lands*  
*meadowlands*  
*prairies*  
*savannahs*  
 GS land  
 . **grasslands**  
 . . Llanos Orientales (Colombia)  
 RT agriculture  
 crop growth  
 Earth resources  
 farm crops  
 farmlands  
 grasses  
 hay  
 land use  
 plains  
 plowing  
 rangelands  
 rural areas  
 rural land use  
 sod  
 steppes
- Grassmann algebra*  
 USE **vector spaces**
- ∞ **gratings**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 RT gratings (spectra)  
 interference grating  
 optical filters
- gratings (spectra)**  
 UF *diffraction gratings*  
 GS **gratings (spectra)**  
 . Bragg gratings  
 . echelette gratings  
 . echelle gratings  
 RT apodization  
 corrugated waveguides  
 diffraction radiation  
 Fresnel diffraction  
 ∞ gratings  
 optical filters  
 photorefractivity  
 Ronchi test  
 Rowland circles
- graupe**  
 (added March 1989)  
 GS precipitation (meteorology)  
 . **graupe**  
 RT cloud glaciation  
 cloud physics  
 hail  
 hailstorms  
 ice formation  
 ice nuclei
- snow
- gravel deposits*  
 USE **gravels**
- gravels**  
 DEF Coarse, granular aggregates, with pieces larger than sand grains, resulting from the natural erosion of rocks. Used for gravel deposits.  
 UF *gravel deposits*  
 GS sediments  
 . **gravels**  
 soils  
 . **gravels**  
 RT aggregates  
 alluvium  
 aquifers  
 boreholes  
 fans (landforms)  
 grit  
 sands
- gravimeters**  
 (added January 1991)  
 DEF Instruments for measuring variations in the gravitational field, generally by registering differences in the weight of a constant mass as the gravimeter is moved from place to place. Used for gravity meters.  
 UF *gravity meters*  
 GS measuring instruments  
 . **gravimeters**  
 RT accelerometers  
 densitometers  
 geodesy  
 geophysics  
 gravimetry  
 gravitation  
 microdensitometers
- gravimetry**  
 DEF The measurement of gravity or gravitational acceleration, especially in geophysics and geodesy.  
 RT ∞ acceleration  
 accelerometers  
 geology  
 geophysics  
 gravimeters  
 gravitational fields  
 ∞ measurement  
 networks  
 quantitative analysis
- gravireceptors**  
 DEF Highly specialized nerve endings and receptor organs located in skeletal muscles, tendons, joints, and in the inner ear which furnish information to the brain with respect to body position, equilibrium and the direction of gravitational forces.  
 GS anatomy  
 . sense organs  
 . . **gravireceptors**  
 . . . otolith organs  
 receptors (physiology)  
 . **gravireceptors**  
 . . otolith organs  
 RT oculogravic illusions  
 sensitometry  
 vertical perception
- gravitation**  
 DEF The acceleration produced by the mutual attraction of two masses, and of magnitude inversely proportional to the square of the distance between the two centers of mass. Used for gravity.  
 UF *gravity*  
 GS **gravitation**  
 . artificial gravity  
 . Earth gravitation  
 . gravity anomalies  
 . lunar gravitation  
 . microgravity  
 . planetary gravitation  
 . stellar gravitation  
 . . solar gravitation  
 RT antigavity
- drag  
 environments  
 Geopotential Research Mission  
 gravimeters  
 gravitational constant  
 gravitational effects  
 gravitational fields  
 gravitational waves  
 gravity gradiometers  
 high gravity environments  
 isostasy  
 low weight  
 Lunar Gravity Simulator  
 pendulums  
 Roche limit  
 similitude law  
 terminal velocity  
 weight (mass)  
 weightlessness
- gravitation theory**  
 GS **gravitation theory**  
 . supergravity  
 RT bimetric theories  
 dark energy  
 event horizon  
 gauge theory  
 grand unified theory  
 gravitational fields  
 gravitational wave antennas  
 gravitinos  
 gravitons  
 string theory  
 supersymmetry  
 ∞ theories  
 unified field theory
- gravitational binding energy**  
 (added May 1995)  
 GS binding energy  
 . **gravitational binding energy**  
 RT accretion disks  
 astrophysics  
 binary stars  
 ∞ energy  
 gravitational collapse  
 neutron stars  
 nuclear binding energy  
 stellar gravitation
- gravitational collapse**  
 GS collapse  
 . **gravitational collapse**  
 RT astrophysics  
 black holes (astronomy)  
 gravitational binding energy  
 gravitational instability  
 naked singularities  
 neutral currents  
 protogalaxies  
 quasars  
 relativistic plasmas  
 stellar cores  
 stellar interiors  
 stellar systems  
 supernovae  
 white holes (astronomy)
- gravitational constant**  
 DEF The coefficient of proportionality in Newton's law of gravitation.  
 GS constants  
 . **gravitational constant**  
 RT big bang cosmology  
 gravitation
- gravitational effects**  
 GS **gravitational effects**  
 . gravitational lenses  
 . Lagrangian equilibrium points  
 . lunar gravitational effects  
 RT acceleration stresses (physiology)  
 acceleration tolerance  
 Bond number  
 clinorotation  
 clinostats  
 drop towers  
 ∞ effects  
 geotropism  
 gravitation

## gravitational fields

gravitational instability  
gravitational physiology  
gravitropism  
gravity perception  
Gravity Probe B  
Langley complex coordinator  
lower body negative pressure  
orbital resonances (celestial mechanics)  
Reissner-Nordstrom solution  
stellar mass accretion  
stellar systems  
swingby technique  
weightlessness

### gravitational fields

DEF Regions that give rise to forces of gravitational attraction.

UF *gravitational potential*

RT attraction

center of gravity  
Earth gravitation  
Earth-Moon system  
field strength  
field theory (physics)  
∞ fields  
geopotential  
geopotential height  
Geopotential Research Mission  
GRACE mission  
GRAIL mission  
grand unified theory  
gravimetry  
gravitation  
gravitation theory  
gravitational instability  
gravitational lenses  
gravity anomalies  
Lagrangian equilibrium points  
multipolar fields  
satellite perturbation  
Schwarzschild metric  
stellar gravitation  
unified field theory  
Yang-Mills fields

### gravitational instability

(added August 1997)

GS dynamic characteristics

. dynamic stability  
. . **gravitational instability**  
stability  
. dynamic stability  
. . **gravitational instability**

RT

astrophysics  
galactic evolution  
gravitational collapse  
gravitational effects  
gravitational fields  
interstellar matter  
Jeans theory  
perturbation  
stellar evolution  
stellar gravitation

### gravitational lenses

GS gravitational effects

. **gravitational lenses**  
lenses

. **gravitational lenses**

RT

black holes (astronomy)  
focusing  
gravitational fields  
light scattering  
massive compact halo objects  
neutron stars  
relativistic effects  
relativity  
stellar gravitation  
white holes (astronomy)

### gravitational physiology

GS physiology

. **gravitational physiology**

RT

acceleration stresses (physiology)  
aerospace medicine  
centrifuging stress  
clinorotation  
clinostats  
fluid shifts (biology)

gravitational effects  
head up tilt  
hindlimb suspension  
physiological acceleration  
physiological effects  
physiological responses  
space flight stress  
stress (physiology)  
tilt-table test

*gravitational potential*

USE **gravitational fields**

*gravitational radiation*

USE **gravitational waves**

### gravitational wave antennas

DEF Devices for receiving propagating gravitational fields produced by some change in the distribution of matter.

GS antennas

. **gravitational wave antennas**

. . LIGO (observatory)

. . . LISA (observatory)

RT

antenna design  
cryogenic equipment  
gravitation theory

### gravitational waves

DEF Hypothetical waves that travel at the speed of light, by which gravitational attraction is propagated.

UF *gravitational radiation*

RT

celestial bodies  
celestial mechanics  
Earth-Moon system  
gravitation  
gravity waves  
LIGO (observatory)  
LISA (observatory)  
∞ radiation  
∞ waves

### gravitinos

GS particles

. elementary particles  
. . hypothetical particles  
. . . **gravitinos**  
. neutral particles  
. . **gravitinos**

RT

baryons  
cosmology  
decoupling  
gravitation theory  
gravitons  
neutrinos  
particle mass  
supergravity  
weak energy interactions

### gravitons

DEF The hypothetical elementary units of gravitation which are equivalent in the electrons in electromagnetic theory.

GS particles

. elementary particles  
. . hypothetical particles  
. . . **gravitons**

RT

atomic structure  
gravitation theory  
gravitinos  
supergravity

### gravitropism

GS tropism

. **gravitropism**

RT

auxins  
calmodulin  
gravitational effects  
gravity perception  
plant physiology  
plants (botany)  
vegetation growth

*gravity*

USE **gravitation**

### gravity anomalies

DEF The differences between the observed values of gravity at different points and the

theoretical calculated value. They are based on a simple gravity model, usually modified in accordance with some generalized hypothesis of variation in subsurface density as related to surface topography.

GS anomalies

. **gravity anomalies**

gravitation

. **gravity anomalies**

RT

Earth gravitation  
gravitational fields  
mascons

*gravity assist trajectories*

USE **swingby technique**

### gravity gradient satellites

GS artificial satellites

. **gravity gradient satellites**

. . ATS

. . . ATS 1

. . . ATS 2

. . . ATS 3

. . . ATS 4

. . . ATS 5

. . . ATS 6

. . . ATS 7

. . . ATS 8

. . ORBIS CAL satellite

RT

artificial gravity  
expulsion  
manned spacecraft  
OV-1 satellites  
OV-2 satellites  
OV-3 satellites  
OV-4 satellites  
OV-5 satellites  
satellite attitude control  
satellite control  
spin reduction  
unmanned spacecraft

### gravity gradiometers

GS measuring instruments

. **gravity gradiometers**

RT

gradients  
∞ gradiometers  
gravitation

*gravity meters*

USE **gravimeters**

### gravity perception

(added August 2004)

DEF Process whereby a bodily structure or organism (animal or plant) receives or detects a gravity stimulus. The sensing may be direct or indirect and may or may not initiate a reaction to the stimulus.

GS perception

. **gravity perception**

RT

acceleration stresses (physiology)  
acceleration tolerance  
aerospace medicine  
centrifuging stress  
gravitational effects  
gravitropism  
head up tilt  
proprioception  
space flight stress

### Gravity Probe B

DEF An experiment designed to measure general relativistic induced torques on a gyroscope in orbit about the Earth.

RT

gravitational effects  
gyroscopes  
NASA programs  
relativity

*Gravity Recovery and Climate Experiment mission*

(added August 2008)

USE **GRACE mission**

*Gravity Recovery and Interior Laboratory*

(added June 2010)

USE **GRAIL mission**

### gravity waves

DEF Waves in an interface between fluids of

different density in which the restoring force is gravity.

- GS elastic waves
  - . capillary waves
  - . . . **gravity waves**
  - . . . baroclinic waves
- surface waves
  - . capillary waves
  - . . **gravity waves**
  - . . . baroclinic waves
- RT cnoidal waves
  - gravitational waves
  - Kelvin waves
  - planetary waves
  - ripples
  - traveling ionospheric disturbances
  - water waves
  - wind (meteorology)

*Gravsat satellites*

USE **Geopotential Research Mission**

### gray gas

- GS gases
  - . **gray gas**
- RT nongray atmospheres
  - radiation absorption
  - Rayleigh scattering
  - thermal absorption

### gray scale

- DEF Images that are not colored or multi-spectral.
- RT aerial photography
  - image contrast
  - image enhancement
  - image processing
  - imaging techniques
  - optical data processing
  - pattern recognition

### grazing

- GS ingestion (biology)
  - . **grazing**
- RT animals
  - cattle
  - deer
  - goats
  - horses
  - rangelands
  - rural land use
  - swine

### grazing flow

- RT acoustic attenuation
  - acoustic ducts
  - acoustic impedance
  - acoustic measurement
  - acoustic properties
  - aeroacoustics
- ∞ flow
  - noise reduction
  - orifice flow
  - resonators
  - shear flow

### grazing incidence

- DEF Incidence at a small glancing angle.
- GS incidence
  - . **grazing incidence**
- RT aberration
  - angles (geometry)
  - grazing incidence telescopes
  - optical measurement
  - ray tracing
  - x ray optics

*Grazing Incidence Solar Telescope*

USE **GRIST (telescope)**

### grazing incidence telescopes

- GS telescopes
  - . **grazing incidence telescopes**
  - . . GRIST (telescope)
- RT grazing incidence
  - x ray astronomy

x ray telescopes

*grazing lands*

USE **grasslands**

### greases

- RT fats
  - kerogen
  - lubricants
  - oils
  - petroleum products
  - thickeners (materials)

### Great Basin (US)

- GS landforms
  - . structural basins
  - . . **Great Basin (US)**
  - . . terraces (landforms)
  - . . plateaus
  - . . . **Great Basin (US)**
- regions
  - . **Great Basin (US)**
- RT California
  - Earth resources
  - fold (geology)
  - formations
  - geology
  - Nevada
  - structural properties (geology)
  - Utah

*Great Britain*

USE **United Kingdom**

### great circles

- DEF Circles which intersect a sphere and a plane through its center.
- GS geometry
  - . Euclidean geometry
  - . . circles (geometry)
  - . . . **great circles**
- RT flight optimization
  - flight paths
  - ground tracks
  - trajectories

### Great Lakes (North America)

- GS lakes
  - . **Great Lakes (North America)**
  - . . Lake Erie
  - . . Lake Huron
  - . . Lake Michigan
  - . . Lake Ontario
  - . . Lake Superior
- RT Canada
  - canals
  - Earth resources
  - inland waters
  - International Field Year for Great Lakes
  - resources
  - United States
  - water flow
  - water resources

### Great Plains Corridor (North America)

- GS corridors
  - . **Great Plains Corridor (North America)**
- regions
  - . **Great Plains Corridor (North America)**
- RT agriculture
  - Canada
  - plains
  - rural land use
  - United States

### Great Salt Lake (UT)

- GS lakes
  - . **Great Salt Lake (UT)**
- RT Earth resources
  - hydrology
  - inland waters
  - ponds
  - Utah

### Great Smoky Mountains (NC-TN)

- GS landforms
  - . mountains

. . **Great Smoky Mountains (NC-TN)**

- RT North Carolina
- Tennessee

### GREB satellites

- SN (GALACTIC RADIATION EXPERIMENTAL BACKGROUND SATELLITES)
- UF *Galactic Radiation Exp Background sats*
- GS artificial satellites
  - . **GREB satellites**

### Greece

- GS nations
  - . **Greece**
- RT Cyprus
  - Europe
  - Greek space program

### greedy algorithms

(added March 2000)

DEF Any algorithm characterized by a procedure that selects the most extreme element from a set to satisfy a given goal. A recursive procedure for constructing a set of objects from the smallest possible elements.

- GS mathematical logic
  - . algorithms
  - . . **greedy algorithms**
- RT graph theory
  - heuristic methods
  - minimax technique
  - optimization

### Greek space program

(added August 1990)

- GS programs
  - . space programs
  - . . European space programs
  - . . . **Greek space program**
- RT Greece

### green wave effect

- RT annual variations
  - botany
  - chlorophylls
- ∞ effects
  - foliage
  - leaves

### greenhouse effect

DEF The heating of the Earth's surface because outgoing long-wavelength terrestrial radiation is absorbed and re-emitted by the carbon dioxide and water vapor in the lower atmosphere and eventually returns to the surface.

- RT atmospheric heat budget
  - atmospheric radiation
  - chlorofluorocarbons
  - climate change
  - Earth atmosphere
- ∞ effects
  - environment effects
  - Gaia hypothesis
  - global warming
  - insolation
  - Orbiting Carbon Observatory (OCO)
  - radiative forcing
  - terrestrial radiation
  - thermal radiation
  - Venus clouds

### greenhouses

DEF Structures enclosed by glass or plastic devoted to the cultivation or protection of tender plants or to the production of plants out of season.

- RT buildings
  - phytotrons
  - plants (botany)

### Greenland

- GS landforms
  - . islands
  - . . **Greenland**
- RT Arctic Ocean
  - Denmark

### Green's functions

- UF *Green's theorem*
- GS analysis (mathematics)



## Gregorian antennas

. real variables  
. . **Green's functions**  
functions (mathematics)  
. **Green's functions**  
RT differential equations  
field theory (algebra)  
field theory (physics)  
half planes  
half spaces  
Jacobi integral  
many body problem

*Green's theorem*

USE **Green's functions**

## Gregorian antennas

GS antennas  
. **Gregorian antennas**  
RT antenna design  
antenna feeds  
antenna radiation patterns  
Cassegrain antennas  
microwave antennas

## Grenada

*(added February 1989)*

GS landforms  
. islands  
. . West Indies  
. . . **Grenada**  
nations  
. **Grenada**  
RT Caribbean region

## grenades

RT ammunition  
incendiary ammunition  
pyrotechnics

## grid computing (computer networks)

*(added December 2003)*

SN (LIMITED TO DISTRIBUTED COMPUTING  
RESOURCES; DOES NOT INCLUDE  
COMPUTATIONAL MESHES USED FOR  
MATHEMATICAL ANALYSIS)

DEF The use and development of large-scale distributed systems that enable location-independent access to geographically dispersed computational resources such as supercomputers, data archives, and computational software; may also incorporate remote access to instrumentation and test-facility interfaces, and supporting information resources.

UF *computational grids (computer networks)*

*Information Power Grid*  
*IPG (NASA Information Power Grid)*  
*metacomputing*

GS data processing  
. distributed processing  
. . **grid computing (computer networks)**

RT computer networks  
information systems  
supercomputers

## grid generation (mathematics)

*(added August 1988)*

DEF Numerical generation of curvilinear-coordinate systems for the numerical solution of partial differential equations.

UF *mesh generation (mathematics)*

RT computational fluid dynamics  
computational grids  
coordinates  
finite difference theory  
finite element method  
grid refinement (mathematics)  
multigrid methods  
structured grids (mathematics)  
unstructured grids (mathematics)  
Voronoi diagrams

## grid refinement (mathematics)

*(added August 2003)*

DEF The dynamic modification of computational grids using either derived or user-supplied criteria to produce a more highly resolved grid.

UF *mesh refinement (mathematics)*

RT computational grids

grid generation (mathematics)

*gridfree methods*

*(added May 2008)*

USE **meshfree methods**

## ∞ grids

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)

RT computational grids  
coordinates  
ionizers  
∞ matrices  
mesh  
reticles  
tube grids  
turnstile antennas  
wire grid lenses

*grids (mathematics)*

USE **computational grids**

## Griffith crack

RT crack closure  
crack propagation  
fracture mechanics  
glass  
∞ theories

*Griffon aircraft*

USE **Nord 1500 aircraft**

## Grigg-Skjellerup comet

GS celestial bodies  
. comets  
. . **Grigg-Skjellerup comet**  
RT ∞ coma  
comet tails  
solar system  
solar wind

## Grignard reactions

GS chemical reactions  
. **Grignard reactions**  
RT catalysts

*GRIN (optics)*

USE **gradient index optics**

## ∞ grinding

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT grinding (material removal)

## grinding (comminution)

UF *pulverizing*  
GS comminution  
. **grinding (comminution)**  
RT atomizing  
compounding  
crushing  
disintegration  
grinding (material removal)  
mixing

## grinding (material removal)

GS **grinding (material removal)**  
. metal grinding  
RT abrasion  
countersinking  
cutting  
∞ grinding  
grinding (comminution)  
grooving  
machining  
metal cutting  
micromachining  
planing  
polishing  
scarfing  
wear

## grinding machines

GS tools  
. machine tools  
. . **grinding machines**  
RT lathes  
∞ machinery  
metal grinding  
milling machines

shapers  
ultrasonic cleaning

## grinding mills

RT atomizers  
atomizing  
comminution  
crushers  
impactors  
mixers

*Gripen aircraft*

USE **JAS-39 aircraft**

## GRIST (telescope)

DEF An ESA Spacelab payload designed for grazing incidence solar phenomena. Used for grazing incidence solar telescope.

UF *Grazing Incidence Solar Telescope*

GS telescopes  
. grazing incidence telescopes  
. . **GRIST (telescope)**

RT energy spectra  
solar cosmic rays  
Spacelab  
sun

## grit

RT abrasives  
gravels  
particles  
sands  
sediments

## grooves

GS **grooves**  
. V grooves  
. . riblets  
RT corrugating  
grooving

## grooving

UF *fluting*  
RT cutting  
grinding (material removal)  
grooves  
knurling  
machining  
micromachining  
milling (machining)  
striation

## gross national product

DEF The total value of the goods and services produced in a nation during a specific period and also comprising the total expenditures by consumers and government plus gross private investment. Used for GNP.

UF *GNP*

GS products  
. **gross national product**  
RT commerce  
costs  
econometrics  
finance  
industries

## ground based control

GS **ground based control**  
. air traffic control  
. . automated en route ATC  
. . radar approach control  
RT air traffic controllers (personnel)  
aircraft approach spacing  
aircraft control  
airport surface detection equipment  
airport towers  
approach  
approach control  
automatic control  
automatic traffic advisory and resolution  
∞ control  
flight control  
flight management systems  
fly by wire control  
guidance (motion)  
instrument landing systems  
integrated mission control center  
landing aids

- missile control
  - radar navigation
  - radio control
  - remote control
  - spacecraft control
  - spacecraft guidance
  - traffic control
- ground clouds*
- USE **exhaust clouds**
- ground crews**
- GS personnel
  - . **ground crews**
  - RT maintenance
- ground effect (aerodynamics)**
- DEF Increase in the lift of an aircraft operating close to the ground caused by reaction between high-velocity downwash from its wing or rotor and the ground.
- RT aerodynamic drag
  - aerodynamics
  - air cushion landing systems
  - cushions
  - downwash
  - drag
  - ∞ effects
  - ground resonance
  - jet blast effects
  - lift
  - peripheral jet flow
  - wakes
  - wing-in-ground effect vehicles
- ground effect (communications)**
- DEF The effect of ground conditions on radio communications.
- RT echoes
  - ∞ effects
  - electromagnetic interference
  - electromagnetic noise
  - radio attenuation
  - signal fading
  - wave reflection
- ground effect machines**
- UF *air cushion vehicles*
  - DTMB-111 ground effect machine*
  - DTMB-430 ground effect machine*
  - hovercraft*
  - GS **ground effect machines**
  - . Cushioncraft ground effect machine
  - . GETOL aircraft
  - . hovercraft ground effect machines
  - . Westland ground effect machines
  - . wing-in-ground effect vehicles
  - RT ∞ aircraft
  - commercial aircraft
  - ∞ effects
  - ∞ flight vehicles
  - flying platforms
  - hovering
  - lifting rotors
  - ∞ machinery
  - ∞ military aircraft
  - passenger aircraft
  - peripheral jet flow
  - rapid transit systems
  - research aircraft
  - ∞ subsonic aircraft
  - surface vehicles
  - ∞ transport vehicles
  - V/STOL aircraft
  - ∞ vehicles
  - water takeoff and landing aircraft
- ground handling**
- GS materials handling
  - . **ground handling**
  - RT air cargo
  - baggage
  - crew procedures (preflight)
  - ∞ facilities
  - flight operations
  - hangars
  - mobile lounges
  - tractors
- trucks
- ground operational support system**
- UF *GOSS (support system)*
  - GS ground support equipment
  - . **ground operational support system**
  - support systems
  - . **ground operational support system**
  - weapon systems
  - . **ground operational support system**
  - RT ∞ systems
- ground penetrating radar**
- (added August 1995)
- DEF A radar imaging technique in which coherent background propagation of the received reflected wavefield forms a spatial image of the scattering interface within the region of interest.
- GS radar
  - . **ground penetrating radar**
  - RT archaeology
  - Mars Reconnaissance Orbiter
  - nondestructive tests
  - planetary mapping
  - radar geology
  - soil mapping
  - synthetic aperture radar
  - tomography
- ground resonance**
- DEF Mechanical phenomenon occurring when a rotor, operating within a certain speed range, experiences coupling between a rotor in-plane mode and a model support system mode, causing vibration in the system.
- RT aerodynamic stability
  - ground effect (aerodynamics)
  - helicopters
  - rotary wings
  - rotor aerodynamics
- ground speed**
- GS rates (per time)
  - . **ground speed**
  - velocity
  - RT **ground speed**
  - airspeed
  - high speed
  - low speed
- ground squirrels**
- GS animals
  - . vertebrates
  - . . mammals
  - . . . rodents
  - . . . . squirrels
  - . . . . . **ground squirrels**
- ground state**
- GS level (quantity)
  - . energy levels
  - . . **ground state**
  - RT atomic energy levels
  - atomic theory
  - density functional theory
  - electron states
  - quantum theory
  - yrast state
- ground stations**
- GS stations
  - . **ground stations**
  - . . Deep Space Instrumentation Facility
  - . . Earth terminals
  - . . integrated mission control center
  - . . polystation doppler tracking system
  - RT data acquisition
  - data collection platforms
  - downlinking
  - Global Tracking Network
  - hangars
  - integrated global ocean station systems
  - Jodrell Bank Observatory
  - land mobile satellite service
- MSAT
  - networks
  - ocean data acquisitions systems
  - pollution monitoring
  - Space Flight Tracking and Data Network
  - tracking stations
  - weather stations
- ground support equipment**
- DEF That equipment on the ground, including all implements, tools, and devices (mobile or fixed), required to inspect, test, adjust, calibrate, appraise, gage, measure, repair, overhaul, assemble, transport, safeguard, record, store, or otherwise function in support of a rocket, space vehicle, or the like, either in the research and development phase or in operational phase, or in support of the guidance system used with the missile, vehicle, or the like.
- GS **ground support equipment**
  - . ground operational support system
  - RT air traffic control
  - aircraft maintenance
  - airport planning
  - auxiliary power sources
  - ballistic cameras
  - Cape Kennedy launch complex
  - command and control
  - command guidance
  - crawler tractors
  - Earth terminal measurement system
  - ∞ equipment
  - flight control
  - gantry cranes
  - handling equipment
  - landing aids
  - launching bases
  - launching pads
  - launching sites
  - maintenance
  - missile launchers
  - missile storage
  - missiles
  - ordnance
  - propellant storage
  - radio telemetry
  - refueling
  - rocket launchers
  - satellite ground support
  - ∞ spacecraft
  - storable propellants
  - ∞ test equipment
  - tracking networks
  - tracking stations
- ground support systems**
- GS support systems
  - . **ground support systems**
  - RT commonality
  - ∞ systems
- ground tests**
- GS **ground tests**
  - . cold flow tests
  - . prelaunch tests
  - . . static firing
  - RT aircraft runup
  - captive tests
  - crew procedures (preflight)
  - electric equipment tests
  - engine tests
  - flight tests
  - full scale tests
  - missile tests
  - prefiring tests
  - preflight operations
  - space electric rocket tests
  - stability tests
  - static tests
  - test firing
  - ∞ tests
  - wing flow method tests
- ground tracks**
- DEF The inclination of a satellite, together with its orbital altitude and period of its orbit, create a track defined by an imaginary line connecting the satellite and the Earth's center;

## ground truth

the satellite's apparent path over the ground.

- GS **ground tracks**
  - . satellite ground tracks
- RT area navigation
  - flight paths
  - great circles
  - orbits
- ∞ paths
- ∞ tracks

### ground truth

DEF Data obtained on the ground concerning the significance of anomalies observed in remote sensing to help interpretation.

- RT aerial photography
  - aerial reconnaissance
  - Airborne Integrated Reconnaissance System
  - crop identification
  - imagery
  - in situ measurement
  - photointerpretation
  - photoreconnaissance
  - spectrophotography

### ground water

(added February 1991)

DEF That part of the subsurface water that is in the zone of saturation, including underground streams.

- UF *groundwater*
- GS geophysical fluids
  - . **ground water**
  - water
  - . inland waters
  - . . **ground water**
- RT aquifers
  - Earth resources
  - fresh water
  - limnology
  - lysimeters
  - potable water
  - soil pollution
  - springs (water)
  - surface water
  - water flow
  - water resources
  - water runoff
  - water sampling
  - water tables
  - wells

### ground wave propagation

- GS transmission
  - . wave propagation
  - . . **ground wave propagation**
- RT radio waves
  - selective fading
  - sky waves

### ground wind

- GS wind (meteorology)
  - . **ground wind**
- RT air currents
  - atmospheric circulation
  - cyclones
  - gust loads
  - gusts
  - monsoons
  - squalls
  - storms (meteorology)
  - tornadoes
  - wind direction
  - wind effects
  - wind erosion
  - wind pressure
  - wind profiles
  - wind shear
  - wind velocity
  - windmills (windpowered machines)
  - windpower utilization
  - windpowered generators

### ground-air-ground communication

- GS communicating
  - . **ground-air-ground communication**
  - telecommunication
  - . **ground-air-ground communication**
- RT aeronautical satellites
  - air traffic control

- aircraft communication
- automated en route ATC
- communication satellites
- discrete address beacon system
- optical communication
- radio communication
- satellite communication
- spacecraft communication
- voice communication

### *ground-to-air missiles*

USE **surface to air missiles**

### *groundwater*

USE **ground water**

### *Group 1A compounds*

USE **alkali metal compounds**

### ∞ **Group 1B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - copper compounds
  - noble metals
  - silver compounds

### *Group 2A compounds*

USE **alkaline earth compounds**

### ∞ **Group 2B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT cadmium compounds
  - ∞ chemical compounds
  - mercury compounds
  - zinc compounds

### ∞ **Group 3A compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aluminum compounds
  - boron compounds
  - ∞ chemical compounds
  - gallium compounds
  - indium compounds

### ∞ **Group 3B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT actinide series compounds
  - ∞ chemical compounds
  - curium compounds
  - rare earth compounds
  - scandium compounds
  - yttrium compounds

### ∞ **Group 4A compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT carbon compounds
  - ∞ chemical compounds
  - germanium compounds
  - lead compounds
  - silicon compounds
  - tin compounds

### ∞ **Group 4B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - hafnium compounds
  - titanium compounds
  - zirconium compounds

### ∞ **Group 5A compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *pnictides*
- RT antimony compounds
  - arsenic compounds
  - bismuth compounds
  - ∞ chemical compounds
  - nitrogen compounds
  - oxynitrides

phosphorus compounds

### ∞ **Group 5B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - niobium compounds
  - tantalum compounds
  - vanadium compounds

### ∞ **Group 6A compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT chalcogenides
  - ∞ chemical compounds
  - polonium compounds
  - selenium compounds
  - sulfur compounds
  - tellurium compounds

### ∞ **Group 6B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - chromium compounds
  - molybdenum compounds
  - tungsten compounds

### *Group 7A compounds*

USE **halogen compounds**

### ∞ **Group 7B compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - manganese compounds
  - rhenium compounds
  - technetium compounds

### ∞ **Group 8 compounds**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ∞ chemical compounds
  - cobalt compounds
  - iridium compounds
  - iron compounds
  - nickel compounds
  - osmium compounds
  - platinum compounds
  - rhodium compounds

### *group behavior*

USE **group dynamics**

### **group dynamics**

- UF *group behavior*
- RT dependence
  - ∞ dynamics
  - ethnic factors
  - problem solving
  - sociology

### **group technology (manufacturing)**

(added April 2000)

DEF A manufacturing methodology where production processes are organized into groups or cells based on similarities in the manufacturing requirements of product parts or production equipment capabilities.

- UF *cellular manufacturing*
- GS manufacturing
  - . **group technology (manufacturing)**
  - production engineering
  - . **group technology (manufacturing)**
- RT computer aided manufacturing
  - industrial management
  - operations research
  - process control (industry)
  - production management

### **group theory**

- GS algebra
  - . **group theory**
  - . . homomorphisms
  - . . . automorphisms
  - . . . monoids
  - . . . subgroups
- RT chiral dynamics
  - chirality

- fibers (mathematics)  
lie groups  
supergravity  
supersymmetry  
∞ theories
- group velocity**  
DEF The velocity of a wave disturbance as a whole, i.e., of an entire group of component simple harmonic waves.  
GS rates (per time)  
. **group velocity**  
velocity  
. **group velocity**  
RT beat frequencies  
harmonic motion  
phase velocity  
propagation velocity  
quantum mechanics  
wave propagation
- ∞ **groups**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT categories  
classes  
subdivisions
- grout**  
RT amorphous materials  
cements  
clays  
concretes  
∞ construction materials  
mortars (material)  
mud  
plasters  
tiles
- growth**  
UF *hypertrophy*  
*maturing*  
GS **growth**  
. crystal growth  
. . . Czochralski method  
. . . directional solidification (crystals)  
. . . epitaxy  
. . . atomic layer epitaxy  
. . . electroepitaxy  
. . . liquid phase epitaxy  
. . . molecular beam epitaxy  
. . . vapor phase epitaxy  
. . . hydrothermal crystal growth  
. . . protein crystal growth  
. . . traveling solvent method  
. . . Verneuil process  
. vegetation growth  
. . . crop growth  
. nanostructure growth  
RT accumulations  
angiogenesis  
crop calendars  
∞ development  
evolution (development)  
∞ formation  
germination  
increasing  
inflating  
ontogeny  
phytotrons  
shrinkage  
sintering  
swelling  
timber vigor  
timberline  
tissue engineering  
trends  
viability  
warping  
youth
- growth chambers*  
USE **phytotrons**
- growth hormone*  
(added August 2004)  
USE **pituitary hormones**
- Grumman aircraft**  
GS **Grumman aircraft**
- . A-6 aircraft  
. C-1A aircraft  
. C-2 aircraft  
. E-2 aircraft  
. F-9 aircraft  
. F-14 aircraft  
. F-111 aircraft  
. Jetstream aircraft  
. OV-1 aircraft  
RT ∞ aircraft  
AWACS aircraft
- Grumman OV-1C aircraft*  
USE **OV-1 aircraft**
- Gruneisen constant**  
GS constants  
. **Gruneisen constant**  
RT compressibility  
specific heat  
thermal expansion
- GTDS*  
USE **Goddard Trajectory Determination System**
- Guadeloupe**  
GS landforms  
. islands  
. . . West Indies  
. . . **Guadeloupe**  
nations  
. France  
. **Guadeloupe**
- Guam**  
GS landforms  
. islands  
. . . Pacific islands  
. . . **Guam**  
nations  
. United States  
. **Guam**
- guanethidine**  
GS organic compounds  
. amines  
. . . diamines  
. . . guanidines  
. . . . **guanethidine**  
. cyclic compounds  
. heterocyclic compounds  
. . . **guanethidine**
- guanidines**  
GS organic compounds  
. amines  
. . . diamines  
. . . **guanidines**  
. . . . guanethidine  
. . . . triaminoguanidinium azide  
RT perfluoroguanidine
- guanines**  
GS bases (chemical)  
. **guanines**  
fungicides  
. xanthines  
. . . **guanines**  
nitrogen compounds  
. xanthines  
. . . **guanines**  
organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . purines  
. . . . xanthines  
. . . . . **guanines**  
RT cyclic AMP
- guanosines**  
DEF Guanine riboside; a nucleoside composed of guanine and ribose. Used for vermine.  
UF *vernine*  
GS organic compounds  
. carbohydrates  
. . . glucosides  
. . . nucleosides  
. . . . **guanosines**  
RT nucleic acids
- ribonucleic acids
- guards (shields)**  
RT ∞ barriers  
coverings  
housings  
safety devices  
safety management  
shielding
- Guatemala**  
GS nations  
. **Guatemala**  
RT Central America
- guayule**  
DEF A desert shrub native to southwestern United States and north Mexico that produces polymeric isoprene essentially identical to that made by Hevea rubber trees in southeast Asia.  
GS plants (botany)  
. **guayule**  
RT brush (botany)  
rubber
- GUI (computers)*  
USE **graphical user interface**
- guidance (motion)**  
DEF The process of directing the movements of an aeronautical vehicle or space vehicle, with particular reference to the selection of a flight path.  
GS **guidance (motion)**  
. aircraft guidance  
. beam rider guidance  
. command guidance  
. entry guidance (STS)  
. inertial guidance  
. . . strapdown inertial guidance  
. injection guidance  
. map matching guidance  
. midcourse guidance  
. reentry guidance  
. rendezvous guidance  
. spacecraft guidance  
. . . satellite guidance  
. standardized space guidance  
. terminal guidance  
. . . laser guidance  
RT air navigation  
approach  
ascent trajectories  
astrionics  
automatic control  
avionics  
control surfaces  
flight control  
flight paths  
ground based control  
homing  
homing devices  
impact prediction  
landing  
manual control  
missiles  
navigation  
∞ platforms  
pointing control systems  
radio navigation  
remote control  
stationkeeping  
∞ systems  
trajectory control  
visual control
- guidance sensors**  
RT attitude control  
image dissector tubes  
optical measuring instruments  
∞ sensors  
solar sensors  
spacecraft instruments  
star trackers
- guide vanes**  
DEF Control surfaces that may be moved into or against a rocket's jetstream, used to change the direction of the jet flow for thrust vector control. Used for jetavators.

## guided missile submarines

UF *jetavators*  
 GS control surfaces  
 . **guide vanes**  
 . . jet vanes  
 vanes  
 . **guide vanes**  
 . . jet vanes  
 RT airfoils  
 hydrofoils  
 thrust vector control

**guided missile submarines**  
 UF *Polaris submarines*  
 GS water vehicles  
 . ships  
 . . submarines  
 . . . **guided missile submarines**  
 . underwater vehicles  
 . . submarines  
 . . . **guided missile submarines**  
 RT fleet ballistic missiles  
 Poseidon missiles

**Guinea**  
 GS nations  
 . **Guinea**  
 RT Africa

**guinea pigs**  
 GS animals  
 . vertebrates  
 . . mammals  
 . . . rodents  
 . . . . **guinea pigs**

**Gulf of Alaska**  
 GS gulfs  
 . **Gulf of Alaska**  
 RT Alaska  
 Pacific Ocean

**Gulf of California (Mexico)**  
 GS gulfs  
 . **Gulf of California (Mexico)**  
 RT Mexico  
 Pacific Ocean

**Gulf of Mexico**  
 GS gulfs  
 . **Gulf of Mexico**  
 RT Alabama  
 Caribbean Sea  
 Florida  
 Louisiana  
 Mexico  
 Mississippi  
 Rio Grande (North America)  
 texas

**Gulf Stream**  
 GS circulation  
 . water circulation  
 . . water currents  
 . . . ocean currents  
 . . . . **Gulf Stream**  
 RT Atlantic Ocean  
 Caribbean Sea  
 Lomonosov current  
 Sargasso Sea  
 TOPEX

**gulfs**  
 DEF Relatively large parts of oceans or seas extending far into the land, partly enclosed by an extensive sweep of the coasts, and opened to the sea through straits. Gulfs are the largest of various forms of inlets of seas. They are usually larger, more enclosed, and more deeply indented than bays (topographic features).  
 GS **gulfs**  
 . Gulf of Alaska  
 . Gulf of California (Mexico)  
 . Gulf of Mexico  
 . Persian Gulf  
 RT bays (topographic features)  
 Delaware Bay (US)  
 inlets (topography)

topography

**Gum nebula**  
 GS celestial bodies  
 . nebulae  
 . . **Gum nebula**  
 RT galaxies  
 irregular galaxies  
 Orion nebula

*gum vulcanizates*  
 USE **vulcanized elastomers**

*Gumbel theory*  
 USE **range (extremes)**

**gums (substances)**  
 GS **gums (substances)**  
 . rosin  
 RT chitin  
 polysaccharides  
 rubber  
 tars

**gun launchers**  
 SN (LIMITED TO ORDNANCE DEVICES FOR FIRING MISSILES AND ROCKETS WITH INITIAL ATTITUDE CONTROL)  
 DEF Ordnance devices for firing missiles and rockets with initial attitude control.  
 GS launchers  
 . **gun launchers**  
 RT artillery  
 ∞ barrels  
 gunfire  
 howitzers  
 hypervelocity launchers  
 missile launchers  
 rocket catapults  
 rocket launchers  
 Sabot projectiles

**gun propellants**  
 UF *gunpowder*  
 GS propellants  
 . **gun propellants**  
 RT explosives  
 guns (ordnance)

**gun turrets**  
 RT ∞ cupolas  
 guns (ordnance)  
 ∞ turret

**gunfire**  
 RT artillery fire  
 fire control  
 firing (igniting)  
 gun launchers  
 guns (ordnance)  
 projectiles

**Gunn diodes**  
 GS electronic equipment  
 . diodes  
 . . semiconductor diodes  
 . . . **Gunn diodes**  
 . . . . transferred electron devices  
 RT gallium arsenides  
 negative resistance devices  
 semiconductor devices

**Gunn effect**  
 RT ∞ effects  
 negative conductance  
 negative resistance devices  
 semiconductor devices  
 semiconductor lasers

**gunnery training**  
 GS education  
 . **gunnery training**  
 RT artillery  
 fire control  
 guns (ordnance)  
 howitzers

weapons

*gunpowder*  
 USE **gun propellants**

∞ **guns**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT crossed field guns  
 electron guns  
 gas guns  
 guns (ordnance)  
 hypervelocity guns  
 plasma guns

**guns (ordnance)**  
 UF *cannons*  
 GS weapons  
 . **guns (ordnance)**  
 . . artillery  
 . . . howitzers  
 . . . precision guided projectiles  
 . . rifles  
 RT ammunition  
 explosives  
 gun propellants  
 gun turrets  
 gunfire  
 gunnery training  
 ∞ guns  
 heat of combustion  
 hypervelocity guns  
 incendiary ammunition  
 projectiles  
 propellants  
 Sabot projectiles

**gust alleviators**  
 RT deflectors  
 gusts  
 mission adaptive wings  
 spoilers  
 turbulent flow  
 vortex alleviation

**gust loads**  
 GS aerodynamic forces  
 . aerodynamic loads  
 . . **gust loads**  
 loads (forces)  
 . dynamic loads  
 . . aerodynamic loads  
 . . . **gust loads**  
 . . transient loads  
 . . . **gust loads**  
 . random loads  
 . . **gust loads**  
 RT atmospheric turbulence  
 blast loads  
 ground wind  
 gusts  
 structural design criteria  
 wind pressure  
 wing loading

*gustatory perception*  
 USE **taste**

**gusts**  
 GS turbulence  
 . atmospheric turbulence  
 . . **gusts**  
 wind (meteorology)  
 . **gusts**  
 RT clear air turbulence  
 ground wind  
 gust alleviators  
 gust loads  
 sea breeze  
 storm damage  
 storms  
 storms (meteorology)  
 vortex avoidance

*GUT*  
 USE **grand unified theory**

**Gutenberg zone**  
 GS models  
 . **Gutenberg zone**

regions  
 . **Gutenberg zone**  
 RT acoustic velocity  
 seismic waves

**guy wires**  
 UF *stays*  
 GS wire  
 . **guy wires**  
 RT anchors (fasteners)  
 structural members

**Guyana**  
 UF *British Guinea*  
 GS nations  
 . **Guyana**  
 RT Caribbean region  
 South America

*gymnastics*  
 USE **physical exercise**

**gynecology**  
 GS medical science  
 . **gynecology**  
 RT females  
 genitourinary system

**gypsum**  
 DEF The mineral consisting primarily of fully hydrated calcium sulfate (calcium sulfate dihydrate).  
 GS minerals  
 . **gypsum**  
 plasters  
 . **gypsum**  
 RT calcium  
 chalk  
 rocks  
 sedimentary rocks  
 sulfates

*gyrals*  
 USE **gyres**

**gyration**  
 GS **gyration**  
 . precession  
 . . Larmor precession  
 . . proton precession  
 . . quenching (atomic physics)  
 . revolving  
 . rotation  
 . . autorotation  
 . . corotation  
 . . counter rotation  
 . . Earth rotation  
 . . galactic rotation  
 . . image rotation  
 . . lunar rotation  
 . . molecular rotation  
 . . muon spin rotation  
 . . planetary rotation  
 . . satellite rotation  
 . . stellar rotation  
 . . . solar rotation  
 . . clinorotation  
 . . superrotation  
 RT angular velocity  
 coning motion  
 ∞ motion  
 spin dynamics

**gyrators**  
 UF *Tellegen theory*  
 GS microwave equipment  
 . **gyrators**  
 . . microwave filters  
 RT ferrites  
 microwave switching  
 network analysis  
 phase shift circuits  
 waveguides

**gyres**  
 DEF Closed circulatory systems in a body of water, larger than an eddy or a whirlpool. There is a circular motion of water in each of the major ocean basins, centered on a subtropical high-pressure region. These movements are gener-

ated by connective flow of warm surface water poleward, by the deflective effect of the Earth's rotation and by the effects of prevailing winds. The water within each gyre turns clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere. Acceleration causes sea level to fall along mainland coasts; deceleration leads to rise.

UF *gyrals*  
 RT air water interactions  
 coastal currents  
 Coriolis effect  
 ocean currents  
 oceanography

**gyro horizons**

DEF Artificial horizons or attitude gyroscopes.

GS display devices  
 . **gyro horizons**  
 flight instruments  
 . attitude indicators  
 . . **gyro horizons**  
 gyroscopes  
 . attitude gyros  
 . . **gyro horizons**  
 horizon  
 . **gyro horizons**  
 measuring instruments  
 . indicating instruments  
 . . attitude indicators  
 . . . **gyro horizons**  
 navigation aids  
 . navigation instruments  
 . . attitude indicators  
 . . . **gyro horizons**

**gyrocompasses**

DEF Compasses consisting of a continuously driven Foucault gyroscope whose supporting ring normally confines the spinning axis to a horizontal plane, so that the Earth's rotation causes the spinning axis to assume a position in a plane passing through the Earth's axis, and thus to point to true north.

GS gyroscopes  
 . **gyrocompasses**  
 measuring instruments  
 . indicating instruments  
 . . compasses  
 . . . **gyrocompasses**  
 navigation aids  
 . navigation instruments  
 . . compasses  
 . . . **gyrocompasses**  
 RT magnetic compasses  
 radio direction finders  
 solar compasses

**gyrodampers**

DEF Single-gimbal control moment gyros actively controlled to extract the structural vibratory energy through the local rotational deformations of a structure; used in large space structures.

RT control moment gyroscopes  
 gimbals  
 gyroscopic stability  
 structural vibration  
 vibration damping

**Gyrodyne aircraft**

DEF A rotorcraft whose rotors are not engine-driven except for initial starting, but are made to rotate by action of the air when the rotorcraft is moving; and whose means of propulsion, consisting usually of conventional propellers, is independent of the rotor system.

GS **Gyrodyne aircraft**  
 . QH-50 helicopter  
 RT ∞ aircraft

*Gyrodyne DSN-3 helicopter*

USE **QH-50 helicopter**

*Gyrodyne military aircraft*

USE **QH-50 helicopter**

**gyrofrequency**

DEF The natural period of revolution of a

free electron in the Earth's magnetic field.

GS magnetic properties  
 . **gyromagnetism**  
 . . **gyrofrequency**  
 RT charged particles  
 magnetoionics

*gyrointeraction*

USE **magnetic rigidity**

**gyromagnetism**

GS magnetic properties  
 . **gyromagnetism**  
 . . gyrofrequency  
 RT Larmor radius

*gyroplanes*

USE **helicopters**

*gyros*

USE **gyroscopes**

**gyroscope fluids**

RT damping  
 ∞ fluids  
 rotary gyroscopes  
 suspending (hanging)

**gyroscopes**

DEF Devices which utilize the angular momentum of a spinning mass (rotor) to sense angular motion of its base about one or two axes orthogonal to the spin axis. Used for gyros, gyroscopic drift, and gyrostats.

UF *gyros*  
*gyroscopic drift*  
*gyrostats*  
 GS **gyroscopes**  
 . attitude gyros  
 . . gyro horizons  
 . control moment gyroscopes  
 . cryogenic gyroscopes  
 . electrostatic gyroscopes  
 . gyrocompasses  
 . gyroscopic pendulums  
 . gyrostabilizers  
 . laser gyroscopes  
 . nuclear gyroscopes  
 . optical gyroscopes  
 . rotary gyroscopes  
 . . fluid rotor gyroscopes  
 . tuning fork gyroscopes  
 RT automatic pilots  
 gimballess inertial navigation  
 gimbals  
 Gravity Probe B  
 gyroscopic stability  
 precession  
 ∞ stabilizers  
 torquers

**gyroscopic coupling**

GS coupling  
 . **gyroscopic coupling**  
 RT navigation

*gyroscopic drift*

USE **gyroscopes**  
**gyroscopic stability**

**gyroscopic pendulums**

UF *pendulous gyroscopes*  
 GS gyroscopes  
 . **gyroscopic pendulums**  
 oscillators  
 . mechanical oscillators  
 . . pendulums  
 . . . **gyroscopic pendulums**  
 RT accelerometers  
 damping  
 Schuler tuning

**gyroscopic stability**

UF *gyroscopic drift*  
 GS dynamic characteristics  
 . dynamic stability  
 . . motion stability  
 . . . attitude stability  
 . . . . directional stability  
 . . . . . **gyroscopic stability**

## gyrostabilizers

- . . . rotary stability
- . . . . **gyroscopic stability**
- stability
- . dynamic stability
- . . motion stability
- . . . attitude stability
- . . . . directional stability
- . . . . . **gyroscopic stability**
- . . . . rotary stability
- . . . . . **gyroscopic stability**

RT damping  
gyrodampers  
gyroscopes  
hovering stability  
inertial platforms

precession  
rotary gyroscopes  
Schuler tuning  
sea keeping  
stabilized platforms  
stable oscillations  
yo-yo devices

**gyrostabilizers**

GS gyroscopes  
. **gyrostabilizers**

RT navigation aids  
sea keeping  
stabilized platforms

thrust vector control

*gyrostats*  
USE **gyroscopes**

*gyrotrons*  
USE **cyclotron resonance devices**

**gyrotropism**

GS tropism  
. **gyrotropism**

RT electromagnetic properties  
frequency shift

# H

## H alpha line

- GS spectra
  - . radiation spectra
  - . . electromagnetic spectra
  - . . . line spectra
  - . . . . H lines
  - . . . . . **H alpha line**
- RT absorption spectra
- emission spectra
- H II regions
- solar spectra

## H beta line

- GS spectra
  - . radiation spectra
  - . . electromagnetic spectra
  - . . . line spectra
  - . . . . H lines
  - . . . . . **H beta line**
- RT absorption spectra
- Balmer series
- emission spectra
- solar spectra

## H gamma line

- GS spectra
  - . radiation spectra
  - . . electromagnetic spectra
  - . . . line spectra
  - . . . . H lines
  - . . . . . **H gamma line**
- RT absorption spectra
- Balmer series
- emission spectra
- solar spectra

## H I regions

- GS celestial bodies
  - . nebulae
  - . . **H I regions**
  - . hydrogen clouds
  - . **H I regions**
- RT ∞ clouds
  - hydrogen atoms
  - interstellar gas
  - interstellar matter
  - neutral atoms
  - neutral gases
  - radio spectra

## H II regions

- GS celestial bodies
  - . nebulae
  - . . **H II regions**
  - . hydrogen clouds
  - . **H II regions**
- RT ∞ clouds
  - emission spectra
  - H alpha line
  - hydrogen ions
  - interstellar gas
  - interstellar matter
  - ionized gases

## H lines

- SN (EXCLUDES SURFACES OF CONSTANT MAGNETIC FIELD STRENGTH)
- GS spectra
  - . radiation spectra
  - . . electromagnetic spectra
  - . . . line spectra
  - . . . . **H lines**
  - . . . . . H alpha line
  - . . . . . H beta line
  - . . . . . H gamma line
- RT absorption spectra
- Balmer series
- D lines
- emission spectra
- K lines
- Lyman spectra
- Paschen series
- Rydberg series
- solar spectra
- telluric lines

## H waves

- GS electromagnetic radiation
  - . **H waves**

- oscillations
  - . transverse oscillation
  - . . **H waves**
  - transverse waves
  - . **H waves**
- RT electric field strength

## H-1 engine

- GS engines
  - . rocket engines
  - . . booster rocket engines
  - . . . **H-1 engine**
  - . . liquid propellant rocket engines
  - . . . **H-1 engine**
- RT Saturn 1 launch vehicles
- Saturn 1B launch vehicles

## H-2 control

- (added February 1998)
- GS automatic control
  - . optimal control
  - . . **H-2 control**
  - optimization
  - . optimal control
  - . . **H-2 control**
- RT control systems design
- control theory
- controllers
- feedback control
- H-infinity control
- linear quadratic Gaussian control

## H-2 orbiting plane

- USE **HOPE aerospace plane**

## H-13 helicopter

- USE **OH-13 helicopter**

## H-17 helicopter

- UF *Flying Crane helicopter*
- GS Hughes aircraft
  - . **H-17 helicopter**
  - jet aircraft
  - . **H-17 helicopter**
  - research vehicles
  - . research aircraft
  - . . **H-17 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . **H-17 helicopter**
- RT ∞ aircraft

## H-19 helicopter

- GS passenger aircraft
  - . **H-19 helicopter**
  - Sikorsky aircraft
  - . **H-19 helicopter**
  - transport aircraft
  - . **H-19 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-19 helicopter**
- RT ∞ aircraft

## H-21 helicopter

- USE **CH-21 helicopter**

## H-23 helicopter

- USE **OH-23 helicopter**

## H-25 helicopter

- GS Boeing aircraft
  - . **H-25 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . tandem rotor helicopters
  - . . . . **H-25 helicopter**
- RT antisubmarine warfare aircraft

## H-34 helicopter

- USE **CH-34 helicopter**

## H-43 helicopter

- GS Kaman aircraft
  - . **H-43 helicopter**

- V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-43 helicopter**
- RT ∞ aircraft

## H-51 helicopter

- USE **XH-51 helicopter**

## H-53 helicopter

- UF *CH-53 helicopter*
- HX helicopter*
- Sikorsky S-65 helicopter*
- GS passenger aircraft
  - . **H-53 helicopter**
  - Sikorsky aircraft
  - . **H-53 helicopter**
  - transport aircraft
  - . **H-53 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-53 helicopter**
- RT ∞ aircraft

## H-54 helicopter

- GS V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-54 helicopter**
- RT ∞ aircraft

## H-56 helicopter

- GS passenger aircraft
  - . **H-56 helicopter**
  - Sikorsky aircraft
  - . **H-56 helicopter**
  - transport aircraft
  - . **H-56 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-56 helicopter**
- RT ∞ aircraft

## H-60 Helicopter

- DEF The Black Hawk (Sikorsky) assault helicopter. Used for Black Hawk assault helicopter.
- UF *Black Hawk assault helicopter*
- Jayhawk helicopter*
- GS Sikorsky aircraft
  - . **H-60 Helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **H-60 Helicopter**
- RT ∞ aircraft
- ∞ military aircraft

## H-126 aircraft

- UF *Hunting H-126 aircraft*
- GS BAC aircraft
  - . **H-126 aircraft**
  - jet aircraft
  - . **H-126 aircraft**
  - monoplanes
  - . **H-126 aircraft**
  - research vehicles
  - . research aircraft
  - . . **H-126 aircraft**
- RT ∞ aircraft
- jet flaps

## habitability

- RT ecology
- environmental control
- environments
- shelters

## habitats

- SN (LIMITED TO PLANTS AND ANIMALS)
- DEF The areas or types of environment in which plants or animals normally occur or live.
- GS regions



## habits

**. habitats**  
RT animals  
∞ biology  
botany  
conservation  
Earth resources  
ecology  
endangered species  
environment effects  
environments  
wildlife

**habits**  
RT learning  
psychological factors

**habituation (learning)**  
GS learning  
**. habituation (learning)**  
RT conditioning (learning)

**hadrons**  
GS particles  
. elementary particles  
. **hadrons**  
. . . baryons  
. . . . hyperons  
. . . . . xi hyperons  
. . . . . omega-mesons  
. . . . . rho-mesons  
. . . . . sigma-mesons  
. . . mesons  
. . . . eta-mesons  
. . . . hyperons  
. . . . . xi hyperons  
. . . . kaons  
. . . . meson resonance  
. . . . . X mesons  
. . . . muons  
. . . . omega-mesons  
. . . . pions  
. . . . vector mesons  
. . . . . rho-mesons  
. . . . . sigma-mesons  
RT charm (particle physics)  
flavor (particle physics)  
particle decay  
partons  
quark parton model  
vector dominance model

**hafnium**  
GS chemical elements  
**. hafnium**  
. hafnium isotopes  
metals  
. transition metals  
. **hafnium**  
. . hafnium isotopes

**hafnium alloys**  
GS alloys  
**. hafnium alloys**  
RT heat resistant alloys  
niobium alloys  
tantalum alloys  
tungsten alloys  
zirconium alloys

**hafnium carbides**  
GS carbon compounds  
. carbides  
. **hafnium carbides**  
hafnium compounds  
**. hafnium carbides**

**hafnium compounds**  
GS **hafnium compounds**  
. hafnium carbides  
. hafnium iodides  
. hafnium oxides  
RT ∞ chemical compounds  
∞ Group 4B compounds  
∞ metal compounds

**hafnium iodides**  
GS hafnium compounds  
**. hafnium iodides**  
halogen compounds  
. halides

. . metal halides  
. . . **hafnium iodides**  
. iodine compounds  
. . iodides  
. . . **hafnium iodides**

**hafnium isotopes**  
GS chemical elements  
. hafnium  
. **hafnium isotopes**  
. nuclides  
. . isotopes  
. . . **hafnium isotopes**  
metals  
. transition metals  
. hafnium  
. . **hafnium isotopes**

**hafnium oxides**  
GS chalcogenides  
. oxides  
. . metal oxides  
. . . **hafnium oxides**  
hafnium compounds  
**. hafnium oxides**

**hahnium**  
(added November 1994)  
GS chemical elements  
**. hahnium**  
RT ∞ elements

**hail**  
DEF Precipitation in the form of spheroidal layered ice pellets that usually fall from cumulonimbus clouds during thunderstorms. The layered structure of hail is produced by successive accretions of clear and frothy ice.  
UF *hailstones*  
GS precipitation (meteorology)  
**. hail**  
RT cloud glaciation  
graupel  
hailstorms  
ice formation  
storms (meteorology)  
thunderstorms

*hailstones*  
USE **hail**

**hailstorms**  
GS storms  
. storms (meteorology)  
. **hailstorms**  
RT climatology  
graupel  
hail  
meteorology  
precipitation (meteorology)  
rainstorms  
storm damage  
storm enhancement  
storm suppression  
thunderstorms

**hair**  
GS fibers  
**. hair**  
RT keratins  
skin (anatomy)  
wool

*hairpin vortices*  
USE **horseshoe vortices**

**Haiti**  
GS landforms  
. islands  
. . West Indies  
. . . **Haiti**  
nations  
**. Haiti**  
RT Caribbean region  
Caribbean Sea

**HAL/S (language)**  
DEF Programming language developed for the flight software of the NASA Space Shuttle program.

GS languages  
. programming languages  
. . **HAL/S (language)**  
RT computer programming  
computers

**Halden Boiling Water Reactor**  
UF *Halden reactor*  
*HBWR reactor*  
GS nuclear reactors  
. liquid cooled reactors  
. . water cooled reactors  
. . . boiling water reactors  
. . . . **Halden Boiling Water Reactor**

*Halden reactor*  
USE **Halden Boiling Water Reactor**

**Hale-Bopp comet**  
(added July 1998)  
DEF Long-period comet discovered July 23, 1995; designated C/1995 O1.  
GS celestial bodies  
. comets  
. **Hale-Bopp comet**  
RT Oort cloud

**half cones**  
GS cones  
**. half cones**  
RT aerodynamic configurations  
circular cones  
conics  
nose cones

**half life**  
DEF The average time required for one half the atoms in a sample of radioactive element to decay.  
GS life (durability)  
**. half life**  
RT decay  
nuclear reactions  
post-blast nuclear radiation  
radiative lifetime  
radioactive age determination  
radioactive decay  
radioactivity  
reaction kinetics

**half planes**  
GS analysis (mathematics)  
**. half planes**  
RT boundary value problems  
coordinates  
differential equations  
Green's functions

**half spaces**  
GS analysis (mathematics)  
**. half spaces**  
RT boundary value problems  
coordinates  
elliptic differential equations  
fractals  
Green's functions

**halides**  
GS halogen compounds  
**. halides**  
. bromides  
. . ammonium bromides  
. . cesium bromides  
. . chromium bromides  
. . dibromides  
. . hydrobromic acid  
. . hydrobromides  
. . magnesium bromides  
. . potassium bromides  
. . silver bromides  
. . sodium bromides  
. . strontium bromides  
. chlorides  
. . aluminum chlorides  
. . ammonium chlorides  
. . beryllium chlorides  
. . boron chlorides  
. . cadmium chlorides  
. . calcium chlorides  
. . carbon tetrachloride

. . . copper chlorides  
 . . . dichlorides  
 . . . germanium chlorides  
 . . . hydrochlorides  
 . . . hydrogen chlorides  
 . . . hydrochloric acid  
 . . . iron chlorides  
 . . . lanthanum chlorides  
 . . . lead chlorides  
 . . . lithium chlorides  
 . . . magnesium chlorides  
 . . . nitrosyl chlorides  
 . . . nitroxychlorides  
 . . . nitril chlorides  
 . . . phosgene  
 . . . potassium chlorides  
 . . . silicon tetrachloride  
 . . . silver chlorides  
 . . . sodium chlorides  
 . . . sulfur chlorides  
 . . . tetrachlorides  
 . . . titanium chlorides  
 . . . tungsten chlorides  
 . . . zinc chlorides  
 . . . fluorides  
 . . . antimony fluorides  
 . . . barium fluorides  
 . . . boron fluorides  
 . . . chlorine fluorides  
 . . . compound A  
 . . . cryolite  
 . . . deuterium fluorides  
 . . . difluorides  
 . . . calcium fluorides  
 . . . fluorspar  
 . . . hydrofluoric acid  
 . . . metal fluorides  
 . . . aluminum fluorides  
 . . . beryllium fluorides  
 . . . cadmium fluorides  
 . . . calcium fluorides  
 . . . fluorspar  
 . . . cesium fluorides  
 . . . chromium fluorides  
 . . . cobalt fluorides  
 . . . copper fluorides  
 . . . lanthanum fluorides  
 . . . lithium fluorides  
 . . . magnesium fluorides  
 . . . nickel fluorides  
 . . . plutonium fluorides  
 . . . protactinium fluorides  
 . . . sodium fluorides  
 . . . strontium fluorides  
 . . . thorium fluorides  
 . . . tungsten fluorides  
 . . . uranium fluorides  
 . . . zinc fluorides  
 . . . zirconium fluorides  
 . . . nitrogen fluorides  
 . . . nitril fluorides  
 . . . oxyfluorides  
 . . . oxygen fluorides  
 . . . ozone fluoride  
 . . . perchloryl fluorides  
 . . . polyvinyl fluoride  
 . . . sulfur fluorides  
 . . . sulfur hexafluoride  
 . . . technetium fluorides  
 . . . metal halides  
 . . . alkali halides  
 . . . cesium halides  
 . . . cesium bromides  
 . . . cesium fluorides  
 . . . cesium iodides  
 . . . potassium iodides  
 . . . sodium bromides  
 . . . sodium chlorides  
 . . . sodium fluorides  
 . . . sodium iodides  
 . . . aluminum chlorides  
 . . . barium fluorides  
 . . . beryllium chlorides  
 . . . cadmium chlorides  
 . . . calcium chlorides  
 . . . chromium bromides  
 . . . copper chlorides  
 . . . hafnium iodides  
 . . . iron chlorides

. . . lanthanum chlorides  
 . . . lead chlorides  
 . . . lithium chlorides  
 . . . magnesium bromides  
 . . . metal fluorides  
 . . . aluminum fluorides  
 . . . beryllium fluorides  
 . . . cadmium fluorides  
 . . . calcium fluorides  
 . . . fluorspar  
 . . . cesium fluorides  
 . . . chromium fluorides  
 . . . cobalt fluorides  
 . . . copper fluorides  
 . . . lanthanum fluorides  
 . . . lithium fluorides  
 . . . magnesium fluorides  
 . . . nickel fluorides  
 . . . plutonium fluorides  
 . . . protactinium fluorides  
 . . . sodium fluorides  
 . . . strontium fluorides  
 . . . thorium fluorides  
 . . . tungsten fluorides  
 . . . uranium fluorides  
 . . . zinc fluorides  
 . . . zirconium fluorides  
 . . . niobium iodides  
 . . . potassium bromides  
 . . . potassium chlorides  
 . . . silver halides  
 . . . silver bromides  
 . . . silver chlorides  
 . . . silver iodides  
 . . . strontium bromides  
 . . . technetium fluorides  
 . . . titanium chlorides  
 . . . tungsten halides  
 . . . tungsten chlorides  
 . . . tungsten fluorides  
 . . . zinc chlorides  
 . . . zirconium iodides  
 . . . oxyhalides  
 RT halogens  
 molten salts  
 nitrosyls

**halites**

UF *rock salt*  
 RT molten salts  
 ∞ salts

**Hall accelerators**

RT ∞ accelerators  
 alpha plasma devices  
 Hall thrusters  
 magnetohydrodynamics  
 plasma physics

*Hall coefficient*

USE **Hall effect**

*Hall currents*

USE **electric current**  
**Hall effect**

**Hall effect**

DEF The electrical polarization of a horizontal conducting sheet of limited extent, when that sheet moves laterally through a magnetic field having a component vertical to the sheet. The Hall effect is important in determining the behavior of the electrical currents generated by winds in the lower atmosphere. Used for Hall coefficient and Hall currents.

UF *Hall coefficient*  
*Hall currents*  
 GS galvanomagnetic effects  
 . **Hall effect**  
 . quantum Hall effect  
 RT carrier mobility  
 ∞ effects  
 Hall resistance  
 magnetohydrodynamics  
 mobility  
 Pedersen currents  
 polarization (charge separation)  
 semiconductor devices

transport properties

**Hall generators**

DEF Hall plates, together with leads, and where used, encapsulation and ferrous or non-ferrous backing plates.

RT circulators (phase shift circuits)  
 Faraday effect  
 ∞ generators  
 plasma generators  
 signal generators

**Hall resistance**

(added July 2000)

DEF For a current-carrying conductor within a magnetic field, the ratio of the transverse voltage induced by the Hall effect, to the conductor current.

GS electrical properties  
 . electrical impedance  
 . . electrical resistance  
 . . . **Hall resistance**  
 impedance  
 . electrical impedance  
 . . electrical resistance  
 . . . **Hall resistance**  
 RT electrical resistivity  
 Hall effect  
 magnetoresistivity  
 quantum Hall effect  
 ∞ resistance  
 transport properties

**Hall thrusters**

(added June 2000)

DEF Gridless ion engines that produce thrust by electrostatically accelerating plasma ions out of an annular discharge chamber.

GS engines  
 . rocket engines  
 . . electric rocket engines  
 . . . electrostatic engines  
 . . . . ion engines  
 . . . . **Hall thrusters**  
 RT electric propulsion  
 Hall accelerators  
 plasma engines  
 spacecraft propulsion

**Hallam Nuclear Power Facility**

UF *HINPF (Hallam Nuclear Power Facility)*  
 GS electric power plants  
 . nuclear power plants  
 . . **Hallam Nuclear Power Facility**  
 nuclear electric power generation  
 . nuclear power plants  
 . . **Hallam Nuclear Power Facility**  
 RT ∞ power plants  
 sodium graphite reactors

**Halley's comet**

DEF A member of the solar system with an orbit and a period of about 76 years. It appeared in 1985-1986.

GS celestial bodies  
 . comets  
 . . **Halley's comet**  
 RT Giotto mission  
 solar system  
 Vega project

**hallucinations**

GS psychological effects  
 . illusions  
 . . **hallucinations**  
 RT signs and symptoms

**Halo Orbit space station**

GS artificial satellites  
 . space stations  
 . . **Halo Orbit space station**  
 stations  
 . space stations  
 . . **Halo Orbit space station**  
 RT lunar spacecraft

**halocarbons**

DEF Compounds consisting of halogen atoms and carbon atoms.

## halogen compounds

GS carbon compounds  
 . halocarbons  
 . . chlorocarbons  
 . . chlorofluorocarbons  
 . . fluorocarbons  
 . . halon  
 halogen compounds  
 . halocarbons  
 . . chlorocarbons  
 . . chlorofluorocarbons  
 . . fluorocarbons  
 . . halon

RT bromine compounds  
 ∞ chemical compounds  
 chlorine compounds  
 fluorine compounds  
 fluoro compounds  
 iodine compounds

### HALOE

USE **Halogen Occultation Experiment**

### halogen compounds

UF *Group 7A compounds*

GS **halogen compounds**

. bromine compounds  
 . . bromates  
 . . bromides  
 . . ammonium bromides  
 . . cesium bromides  
 . . chromium bromides  
 . . dibromides  
 . . hydrobromic acid  
 . . hydrobromides  
 . . magnesium bromides  
 . . potassium bromides  
 . . silver bromides  
 . . sodium bromides  
 . . strontium bromides  
 . . halon  
 . chlorine compounds  
 . . chlorates  
 . . chlorides  
 . . aluminum chlorides  
 . . ammonium chlorides  
 . . beryllium chlorides  
 . . boron chlorides  
 . . cadmium chlorides  
 . . calcium chlorides  
 . . carbon tetrachloride  
 . . copper chlorides  
 . . dichlorides  
 . . germanium chlorides  
 . . hydrochlorides  
 . . hydrogen chlorides  
 . . . hydrochloric acid  
 . . iron chlorides  
 . . lanthanum chlorides  
 . . lead chlorides  
 . . lithium chlorides  
 . . magnesium chlorides  
 . . nitrosyl chlorides  
 . . nitroxychlorides  
 . . nitril chlorides  
 . . phosgene  
 . . potassium chlorides  
 . . silicon tetrachloride  
 . . silver chlorides  
 . . sodium chlorides  
 . . sulfur chlorides  
 . . tetrachlorides  
 . . titanium chlorides  
 . . tungsten chlorides  
 . . zinc chlorides  
 . . chlorine fluorides  
 . . chlorine oxides  
 . . chlorocarbons  
 . . chlorosilanes  
 . . DDT  
 . . meclizine  
 . . perchlorates  
 . . aluminum perchlorates  
 . . ammonium perchlorates  
 . . hydrazine perchlorates  
 . . hydrogen perchlorate  
 . . hydroxylammonium perchlorates  
 . . lithium perchlorates  
 . . magnesium perchlorates  
 . . nitronium perchlorate

. . . potassium perchlorates  
 . . trichloroethylene  
 . fluorine compounds  
 . . fluorides  
 . . . antimony fluorides  
 . . . barium fluorides  
 . . . boron fluorides  
 . . . chlorine fluorides  
 . . . compound A  
 . . . cryolite  
 . . . deuterium fluorides  
 . . . difluorides  
 . . . calcium fluorides  
 . . . . . fluorspar  
 . . . hydrofluoric acid  
 . . . metal fluorides  
 . . . . . aluminum fluorides  
 . . . . . beryllium fluorides  
 . . . . . cadmium fluorides  
 . . . . . calcium fluorides  
 . . . . . fluorspar  
 . . . . . cesium fluorides  
 . . . . . chromium fluorides  
 . . . . . cobalt fluorides  
 . . . . . copper fluorides  
 . . . . . lanthanum fluorides  
 . . . . . lithium fluorides  
 . . . . . magnesium fluorides  
 . . . . . nickel fluorides  
 . . . . . plutonium fluorides  
 . . . . . protactinium fluorides  
 . . . . . sodium fluorides  
 . . . . . strontium fluorides  
 . . . . . thorium fluorides  
 . . . . . tungsten fluorides  
 . . . . . uranium fluorides  
 . . . . . zinc fluorides  
 . . . . . zirconium fluorides  
 . . nitrogen fluorides  
 . . nitril fluorides  
 . . oxyfluorides  
 . . oxygen fluorides  
 . . ozone fluoride  
 . . perchloryl fluorides  
 . . polyvinyl fluoride  
 . . sulfur fluorides  
 . . . sulfur hexafluoride  
 . . technetium fluorides  
 . . fluorite  
 . fluoro compounds  
 . . cryolite  
 . . difluoro compounds  
 . . . perfluoroalkane  
 . . . polytetrafluoroethylene  
 . . . . . teflon (trademark)  
 . . fluorine organic compounds  
 . . . fluoroamines  
 . . . . . nitrofluoroamines  
 . . . . . trifluoroamine oxide  
 . . . fluorocarbons  
 . . . . . fluorohydrocarbons  
 . . . . . carbon tetrafluoride  
 . . . . . chlorofluoromethane  
 . . . . . polytetrafluoroethylene  
 . . . . . . . teflon (trademark)  
 . . . . . fluoropolymers  
 . . . . . polytetrafluoroethylene  
 . . . . . . . teflon (trademark)  
 . . . . . KEL-F  
 . . . . . polyvinyl fluoride  
 . . . . . perfluoroalkane  
 . . . . . perfluoroguanidine  
 . . fluorosilicates  
 . . tetrafluorohydrazine  
 . halides  
 . . bromides  
 . . . ammonium bromides  
 . . . cesium bromides  
 . . . chromium bromides  
 . . . dibromides  
 . . . hydrobromic acid  
 . . . hydrobromides  
 . . . magnesium bromides  
 . . . potassium bromides  
 . . . silver bromides  
 . . . sodium bromides  
 . . . strontium bromides  
 . . chlorides  
 . . . aluminum chlorides  
 . . . ammonium chlorides  
 . . . beryllium chlorides  
 . . . boron chlorides  
 . . . cadmium chlorides  
 . . . calcium chlorides  
 . . . carbon tetrachloride  
 . . . copper chlorides  
 . . . dichlorides  
 . . . germanium chlorides  
 . . . hydrochlorides  
 . . . hydrogen chlorides  
 . . . . . hydrochloric acid  
 . . . iron chlorides  
 . . . lanthanum chlorides  
 . . . lead chlorides  
 . . . lithium chlorides  
 . . . magnesium chlorides  
 . . . nitrosyl chlorides  
 . . . nitroxychlorides  
 . . . nitril chlorides  
 . . . phosgene  
 . . . potassium chlorides  
 . . . silicon tetrachloride  
 . . . silver chlorides  
 . . . sodium chlorides  
 . . . sulfur chlorides  
 . . . tetrachlorides  
 . . . titanium chlorides  
 . . . tungsten chlorides  
 . . . zinc chlorides  
 . . . . . fluorides  
 . . . . . antimony fluorides  
 . . . . . barium fluorides  
 . . . . . boron fluorides  
 . . . . . chlorine fluorides  
 . . . . . compound A  
 . . . . . cryolite  
 . . . . . deuterium fluorides  
 . . . . . difluorides  
 . . . . . calcium fluorides  
 . . . . . fluorspar  
 . . . . . hydrofluoric acid  
 . . . . . metal fluorides  
 . . . . . aluminum fluorides  
 . . . . . beryllium fluorides  
 . . . . . cadmium fluorides  
 . . . . . calcium fluorides  
 . . . . . fluorspar  
 . . . . . cesium fluorides  
 . . . . . chromium fluorides  
 . . . . . cobalt fluorides  
 . . . . . copper fluorides  
 . . . . . lanthanum fluorides  
 . . . . . lithium fluorides  
 . . . . . magnesium fluorides  
 . . . . . nickel fluorides  
 . . . . . plutonium fluorides  
 . . . . . protactinium fluorides  
 . . . . . sodium fluorides  
 . . . . . strontium fluorides  
 . . . . . thorium fluorides  
 . . . . . tungsten fluorides  
 . . . . . uranium fluorides  
 . . . . . zinc fluorides  
 . . . . . zirconium fluorides  
 . . nitrogen fluorides  
 . . nitril fluorides  
 . . oxyfluorides  
 . . oxygen fluorides  
 . . ozone fluoride  
 . . perchloryl fluorides  
 . . polyvinyl fluoride  
 . . sulfur fluorides  
 . . . sulfur hexafluoride  
 . . technetium fluorides  
 . metal halides  
 . . alkali halides  
 . . . cesium halides  
 . . . . . cesium bromides  
 . . . . . cesium fluorides  
 . . . . . cesium iodides  
 . . . . . potassium iodides  
 . . . . . sodium bromides  
 . . . . . sodium chlorides  
 . . . . . sodium fluorides  
 . . . . . sodium iodides  
 . . aluminum chlorides  
 . . barium fluorides  
 . . beryllium chlorides

- . . . cadmium chlorides
- . . . calcium chlorides
- . . . chromium bromides
- . . . copper chlorides
- . . . hafnium iodides
- . . . iron chlorides
- . . . lanthanum chlorides
- . . . lead chlorides
- . . . lithium chlorides
- . . . magnesium bromides
- . . . metal fluorides
  - . . . . aluminum fluorides
  - . . . . beryllium fluorides
  - . . . . cadmium fluorides
  - . . . . calcium fluorides
  - . . . . fluorspar
  - . . . . cesium fluorides
  - . . . . chromium fluorides
  - . . . . cobalt fluorides
  - . . . . copper fluorides
  - . . . . lanthanum fluorides
  - . . . . lithium fluorides
  - . . . . magnesium fluorides
  - . . . . nickel fluorides
  - . . . . plutonium fluorides
  - . . . . protactinium fluorides
  - . . . . sodium fluorides
  - . . . . strontium fluorides
  - . . . . thorium fluorides
  - . . . . tungsten fluorides
  - . . . . uranium fluorides
  - . . . . zinc fluorides
  - . . . . zirconium fluorides
- . . . niobium iodides
- . . . potassium bromides
- . . . potassium chlorides
- . . . silver halides
  - . . . . silver bromides
  - . . . . silver chlorides
  - . . . . silver iodides
- . . . strontium bromides
- . . . technetium fluorides
- . . . titanium chlorides
- . . . tungsten halides
  - . . . . tungsten chlorides
  - . . . . tungsten fluorides
- . . . zinc chlorides
- . . . zirconium iodides
  - . . . . oxyhalides
- . halocarbons
  - . chlorocarbons
  - . chlorofluorocarbons
  - . fluorocarbons
  - . halon
  - . iodine compounds
  - . iodates
  - . lithium iodates
  - . iodides
    - . . . cesium iodides
    - . . . gallamine triethiodide
    - . . . hafnium iodides
    - . . . niobium iodides
    - . . . potassium iodides
    - . . . silver iodides
    - . . . sodium iodides
    - . . . zirconium iodides
  - . iodoacetic acid
  - . nitrosyls
  - . nitrosyl chlorides

RT  $\infty$  chemical compounds

**Halogen Occultation Experiment**

DEF Shuttle experiment to provide global stratospheric vertical concentration profiles of key chemical species involved in the catalytic destruction of ozone due to chlorine compounds. Used for HALOE.

UF *HALOE*

GS payloads  
 . Space Shuttle payloads  
 . **Halogen Occultation Experiment**

RT ozone

**halogenation**

GS chemical reactions  
 . **halogenation**  
 . . bromination  
 . . chlorination  
 . . fluorination

RT defluorination  
 halogens

**halogens**

GS chemical elements  
 . **halogens**  
 . . astatine  
 . . bromine  
 . . bromine isotopes  
 . . chlorine  
 . . fluorine  
 . . fluorine isotopes  
 . . liquid fluorine  
 . . iodine  
 . . iodine isotopes  
 . . . . iodine 125  
 . . . . iodine 131  
 . . . . iodine 132  
 RT excimer lasers  
 halides  
 halogenation

**halon**

(added January 2000)  
 DEF A bromofluorocarbon compound that was widely used as an agent for fire suppression and explosion protection. After being recognized as an ozone-depleting substance, the U.S. production and import of halons was banned in 1994.

GS carbon compounds  
 . halocarbons  
 . **halon**  
 halogen compounds  
 . bromine compounds  
 . **halon**  
 . halocarbons  
 . **halon**  
 RT fire extinguishers  
 flame retardants  
 fluorocarbons

**halophiles**

RT agriculture  
 plants (botany)

**halos**

GS scattering  
 . wave scattering  
 . . electromagnetic scattering  
 . . . light scattering  
 . . . . **halos**  
 transmission  
 . electromagnetic wave transmission  
 . . light transmission  
 . . . light scattering  
 . . . . **halos**  
 . wave propagation  
 . . light scattering  
 . . . . **halos**  
 RT astronomy  
 atmospheric scattering  
 coronas  
 galactic halos  
 haze  
 images  
 rainbows

**Halphen method**

RT  $\infty$  methodology

**Hamburger aircraft**

GS **Hamburger aircraft**  
 . C-160 aircraft  
 . HFB-320 aircraft  
 RT  $\infty$  aircraft

*Hamburger HFB-320 aircraft*

USE **HFB-320 aircraft**

**Hamiltonian functions**

GS functions (mathematics)  
 . **Hamiltonian functions**  
 RT classical mechanics  
 cluster variation method  
 $\infty$  dynamics  
 Hamilton-Jacobi equation  
 quantum theory

von Zeipel method

**Hamilton-Jacobi equation**

RT  $\infty$  equations  
 equations of motion  
 Hamiltonian functions  
 relativistic particles

**hammerhead configuration**

RT forebodies  
 missile configurations

**hammers**

GS tools  
 . **hammers**  
 . . electromagnetic hammers  
 RT impactors  
 presses  
 rams (presses)

**hamsters**

GS animals  
 . vertebrates  
 . . mammals  
 . . . rodents  
 . . . . **hamsters**

**hand (anatomy)**

GS anatomy  
 . limbs (anatomy)  
 . . **hand (anatomy)**  
 . . . fingers  
 appendages  
 . **hand (anatomy)**  
 . . fingers  
 RT wrist

**handbooks**

GS documents  
 . **handbooks**  
 . . user manuals (computer programs)  
 RT bibliographies  
 directories  
 indexes (documentation)  
 manuals  
 subjects  
 textbooks  
 training analysis

**handedness**

RT chirality  
 lateral stability

*handicaps*

USE **disabilities**

**handles**

RT knobs  
 levers  
 manual control

**Handley Page aircraft**

GS **Handley Page aircraft**  
 . HP-115 aircraft  
 . Victor MK-1 aircraft  
 RT  $\infty$  aircraft

*Handley Page HP-115 aircraft*

USE **HP-115 aircraft**

**handling equipment**

GS **handling equipment**  
 . cranes  
 . . gantry cranes  
 RT crawler tractors  
 $\infty$  equipment  
 ground support equipment  
 harbors  
 locomotives  
 propellant storage  
 $\infty$  storage  
 tractors

## handwriting

transportation

*handling qualities*

USE **controllability**

*hands (robotics)*

USE **end effectors**

### handwriting

GS **handwriting**

. graphology

RT character recognition  
orthography

### Hanford reactors

GS nuclear reactors

. **Hanford reactors**

RT reactor design  
reactor physics  
reactor technology

### hang gliders

DEF Ultralight, unpowered aircraft in which the pilot controls the flight attitude and glide path by shifting his position on a suspended seat (swing seat).

GS gliders

. **hang gliders**

RT ∞ aircraft  
flexible wings  
free flight  
man powered aircraft  
parawings  
sailwings  
soaring  
ultralight aircraft  
∞ winged vehicles

### hangars

(added December 1990)

UF *aircraft hangars*

RT airfield surface movements  
airports  
buildings  
ground handling  
ground stations  
heliports  
military air facilities

### Hankel functions

GS analysis (mathematics)

. complex variables

. . Bessel functions

. . . **Hankel functions**

. real variables

. . Bessel functions

. . . **Hankel functions**

functions (mathematics)

. **Hankel functions**

RT boundary value problems  
differential equations  
orthogonal functions

### Hansen lunar theory

RT Earth orbits

orbital mechanics

perturbation theory

∞ theories

### haplosopes

GS measuring instruments

. optical measuring instruments

. . **haplosopes**

optical equipment

. optical measuring instruments

. . **haplosopes**

RT astigmatism

binocular vision

eye examinations

∞ instruments

optometry

### harbors

DEF Small bays or sheltered parts of seas, lakes, or other large bodies of water, usually well protected either naturally or artificially against high waves and strong currents. Harbors are furnished deep enough to provide safe anchorage for ships; especially such places in which port facilities are furnished.

GS waterways

. **harbors**

. . artificial harbors

RT boats

breakwaters

cargo

dredging

estuaries

freighters

handling equipment

marine transportation

oceanography

∞ ports

regional planning

ship terminals

ships

tanker ships

terminal facilities

traffic

∞ travel

water vehicles

wharves

*hard coal*

USE **anthracite**

### hard landing

DEF An impact landing of a spacecraft on the surface of a planet or natural satellite destroying all equipment except possibly a very rugged package.

GS landing

. **hard landing**

RT aircraft landing

crash landing

emergency landing

lunar landing

planetary landing

soft landing

spacecraft landing

water landing

### hardeners

RT alloys

hardening (materials)

heat treatment

### ∞ hardening

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT hardening (materials)

hardening (systems)

### hardening (materials)

UF *metal hardening*

GS **hardening (materials)**

. carburizing

. cold hardening

. hot pressing

. . hot isostatic pressing

. nitriding

. precipitation hardening

. . maraging

. pulse heating

. shot peening

. silicizing

. work hardening

. . strain hardening

RT aging (materials)

aging (metallurgy)

annealing

coagulation

dispersion strengthening

hardeners

∞ hardening

heat treatment

martensite

metal working

∞ metallurgy

microstructure

normalizing (heat treatment)

oxide dispersion strengthening

peening

quenching (cooling)

∞ setting

softening

tempering

### hardening (systems)

DEF Techniques for decreasing the suscep-

tibility or vulnerability of weapon systems and components.

GS **hardening (systems)**

. radiation hardening

RT ∞ hardening

missile defense

nuclear warfare

∞ systems

### hardness

DEF Resistance of metal to plastic deformation usually by indentation. However, the term may also refer to stiffness or temper, or to resistance to scratching, abrasion, or cutting.

GS mechanical properties

. **hardness**

. . microhardness

. . . Knoop hardness

. . . Rockwell hardness

. . . Vickers hardness

RT abrasion resistance

brittle materials

brittleness

Charpy impact test

cold hardening

ductility

fatigue (materials)

fracture strength

impact strength

indentation

notch tests

plastic properties

softness

surface properties

temper (metallurgy)

toughness

wear

wear resistance

### hardness tests

RT compression tests

high temperature tests

impact tests

Knoop hardness

low temperature tests

∞ materials tests

nanindentation

nondestructive tests

static tests

∞ tests

Vickers hardness

wear tests

### ∞ hardware

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Physical equipment as contrasted to ideas or design that may exist only on paper.

RT computers

electronic modules

∞ equipment

evolvable hardware

firmware

fixtures

reconfigurable hardware

tools

### hardware description languages

(added January 1994)

DEF Formal languages and notations used in the specification, design, simulation, and documentation of computer hardware systems and their component circuits.

UF *HDL (computers)*

*VHDL (computers)*

GS languages

. **hardware description languages**

RT computer design

computer systems simulation

formalism

integrated circuits

logic design

very large scale integration

### hardware utilization lists

UF *HUL*

GS lists

. **hardware utilization lists**

RT ∞ catalogs

- documents
- hardware-in-the-loop simulation**  
(added February 1999)  
UF *hardware-in-the-loop tests*  
GS simulation  
  . **hardware-in-the-loop simulation**  
RT computerized simulation  
  control simulation  
  performance tests  
  systems simulation
- hardware-in-the-loop tests*  
(added February 1999)  
USE **hardware-in-the-loop simulation**
- Harleton meteorite**  
GS celestial bodies  
  . meteorites  
  . . . stony meteorites  
  . . . chondrites  
  . . . **Harleton meteorite**  
RT iron meteorites
- harmonic analysis**  
DEF A statistical method for determining the amplitude and period of certain harmonic or wave components in a set of data with the aid of Fourier series.  
GS analysis (mathematics)  
  . functional analysis  
  . . **harmonic analysis**  
  . . . tesseral harmonics  
  . . . zonal harmonics  
RT Banach space  
  form factors  
  Fourier analysis  
  frequency analyzers  
  microwave resonance
- harmonic control**  
RT  $\infty$  control  
  harmonic oscillation  
  harmonics  
  helicopter control  
  rotary wings  
  vibration damping
- harmonic excitation**  
GS excitation  
  . wave excitation  
  . . **harmonic excitation**  
  harmonics  
  . **harmonic excitation**  
RT acoustics  
  Fourier analysis  
  simple harmonic motion
- harmonic functions**  
DEF Any solution of the Laplace equations.  
GS analysis (mathematics)  
  . complex variables  
  . . **harmonic functions**  
  functions (mathematics)  
  . **harmonic functions**  
RT Airy function  
  Fourier analysis  
  Laplace equation  
  maximum principle
- harmonic generations**  
GS harmonics  
  . **harmonic generations**  
RT acoustics  
  carrier frequencies  
  Fourier analysis  
  phase matching  
  wave generation
- harmonic generators**  
RT comparators  
  frequency converters  
 $\infty$  generators  
  harmonics  
  oscillators
- subharmonic generators
- harmonic motion**  
DEF The projection on a diameter of the circle of such motion.  
GS **harmonic motion**  
  . simple harmonic motion  
RT group velocity  
 $\infty$  motion
- harmonic oscillation**  
GS harmonics  
  . **harmonic oscillation**  
  oscillations  
  . **harmonic oscillation**  
RT acoustics  
  Fourier analysis  
  harmonic control  
  transverse oscillation
- harmonic oscillators**  
GS oscillators  
  . **harmonic oscillators**  
RT harmonics  
  mechanical oscillators  
  subharmonic generators
- harmonic radiation**  
RT electromagnetic radiation  
 $\infty$  radiation
- harmonics**  
DEF Eigenfrequency oscillations excited in a vibrating system. Used for overtones.  
UF *overtones*  
GS **harmonics**  
  . harmonic excitation  
  . harmonic generations  
  . harmonic oscillation  
  . simple harmonic motion  
  . spherical harmonics  
  . superharmonics  
  . tesseral harmonics  
  . zonal harmonics  
RT acoustics  
  cycles  
  Fourier analysis  
  frequencies  
  harmonic control  
  harmonic generators  
  harmonic oscillators  
  nodes (standing waves)  
  resonant frequencies  
  sound-sound interactions  
  standing waves  
  subaudible frequencies  
  subharmonic generators  
  vibration  
  wavelengths
- harnesses**  
RT couches  
  safety devices  
  seat belts  
  seats  
  transmission lines
- Harpoon missile**  
GS missiles  
  . air to surface missiles  
  . . **Harpoon missile**  
RT surface to surface missiles  
  weapon systems
- Harrier aircraft**  
(added February 1993)  
UF *AV-8A aircraft*  
  *AV-8B aircraft*  
  *YAV-8B aircraft*  
GS attack aircraft  
  . fighter aircraft  
  . . **Harrier aircraft**  
  Hawker Siddeley aircraft  
  . **Harrier aircraft**  
RT  $\infty$  aircraft  
  Buccaneer aircraft  
 $\infty$  military aircraft  
  P-1127 aircraft  
  Saab 37 aircraft  
  Vampire MK 35 aircraft
- Vulcan aircraft
- Hartmann flow**  
GS fluid flow  
  . laminar flow  
  . . **Hartmann flow**  
  . steady flow  
  . . **Hartmann flow**  
RT Couette flow  
  magneto hydrodynamic flow  
  magneto hydrodynamics  
  two dimensional flow
- Hartmann number**  
GS dimensionless numbers  
  . **Hartmann number**  
  ratios  
  . **Hartmann number**  
RT magneto hydrodynamics  
  viscous drag
- Hartmann-Sprenger tubes**  
(added August 2003)  
DEF A passive, pulsed-flow device in which under-expanded, sonic or supersonic jet flows impinge on a tube closed on one end, thus producing gas dynamic oscillations and converting a steady flow into a continuous source of pulsed flow.  
RT pulse generators  
 $\infty$  test equipment
- Hartree approximation**  
UF *Hartree-Appleton approximation*  
  *Hartree-Fock approximation*  
GS analysis (mathematics)  
  . numerical analysis  
  . . approximation  
  . . . **Hartree approximation**  
RT atomic structure  
  density functional theory  
  many body problem  
  perturbation theory  
  self consistent fields  
  wave functions
- Hartree-Appleton approximation*  
USE **Hartree approximation**
- Hartree-Fock approximation*  
USE **Hartree approximation**
- Hartree-Fock-Slater method**  
DEF A refined approximation method for the calculation from wave function of electron total energies, kinetic energies, etc., for chemical elements.  
RT atomic physics  
  electron energy  
 $\infty$  methodology  
  Slater orbitals
- Harvard Radio Meteor Project**  
GS programs  
  . projects  
  . . **Harvard Radio Meteor Project**  
RT radio echoes
- hassium**  
(added May 1998)  
GS chemical elements  
  . **hassium**  
RT bohrium  
  meitnerium
- Hastelloy (trademark)**  
GS alloys  
  . nickel alloys  
  . . **Hastelloy (trademark)**  
RT iron alloys  
  molybdenum alloys
- hatches**  
RT air locks  
  doors  
  egress  
  gates (openings)  
  ingress (spacecraft passageway)
- hauling**  
RT cargo

## Hawaii

delivery  
materials handling  
packaging  
transportation  
transportation energy  
trucks

### Hawaii

GS landforms  
. islands  
. . **Hawaii**  
nations  
. United States  
. . **Hawaii**

### Hawk missile

GS missiles  
. surface to air missiles  
. . **Hawk missile**  
RT solid propellant rocket engines

### Hawker Hunter aircraft

USE **F-2 aircraft**

### Hawker P-1127 aircraft

USE **P-1127 aircraft**

### Hawker P-1154 aircraft

USE **P-1154 aircraft**

### Hawker Siddeley aircraft

GS **Hawker Siddeley aircraft**  
. Argosy MK-1 aircraft  
. AVRO 707 aircraft  
. Buccaneer aircraft  
. Comet 4 aircraft  
. DH 112 aircraft  
. DH 115 aircraft  
. DH 121 aircraft  
. DH 125 aircraft  
. F-2 aircraft  
. GA-5 aircraft  
. Harrier aircraft  
. HS-748 aircraft  
. HS-801 aircraft  
. P-1127 aircraft  
. P-1154 aircraft  
. Shackleton bomber  
. Vampire MK 35 aircraft  
. Vulcan aircraft  
RT ∞ aircraft

### Hawkeye 1 satellite

USE **Explorer 52 satellite**

### Hawkeye aircraft

USE **E-2 aircraft**

### Hawkeye satellites

GS artificial satellites  
. scientific satellites  
. . **Hawkeye satellites**

### hay

GS farm crops  
. **hay**  
plants (botany)  
. grasses  
. . **hay**  
RT agriculture  
botany  
Earth resources  
farmlands  
∞ food  
grasslands  
leguminous plants

### Haynes Stellite

USE **Stellite (trademark)**

### HAZ (metallurgy)

USE **heat affected zone**

### hazardous material disposal (in space)

DEF The disposal in space of hazardous material. When radioactive materials are involved, the expected lifetime of orbit exceeds the lifetime of the radioactivity.

GS disposal  
. waste disposal

### . . hazardous material disposal (in space)

management  
. waste management  
. . waste disposal  
. . . **hazardous material disposal (in space)**  
RT aerospace environments  
public health  
radioactive wastes  
toxicity and safety hazard

### hazardous materials

(added March 1997)

#### GS hazardous materials

. hazardous wastes  
RT biological hazards  
carcinogens  
contaminants  
explosives  
hazards  
∞ materials  
poisons  
radiation hazards  
toxic hazards  
toxins and antitoxins  
waste disposal

### hazardous wastes

(added March 1997)

#### GS hazardous materials

. **hazardous wastes**  
wastes

#### RT hazardous wastes

biological hazards  
contaminants  
environmental cleanup  
hazards  
radiation hazards  
toxic hazards  
waste disposal

### hazards

UF *danger*  
*noise hazards*  
GS **hazards**  
. aircraft hazards  
. . runway incursions  
. flight hazards  
. . meteoroid hazards  
. biological hazards  
. operational hazards  
. radiation hazards  
. toxic hazards  
RT accident prevention  
accidents  
aircraft spin  
avoidance  
crash injuries  
∞ detectors  
explosions  
fires  
flammable gases  
hazardous materials  
hazardous wastes  
incompatibility  
injuries  
low visibility  
noise tolerance  
occupational diseases  
protection  
risk  
risk assessment  
sabotage  
safety  
safety devices  
safety factors  
safety management  
spacecraft breakup  
spontaneous combustion  
toxicology  
warning systems

### haze

DEF Fine particles of dust, salt, or water dispersed through a part of the atmosphere, diminishing transparency of the air, causing colors to assume a characteristic subdued opalescent appearance, and reducing the horizontal visibility to more than one, but less than two

kilometers. The obscuration, or lack of transparency, of the atmosphere near the Earth's surface, is often caused by haze or by heat refraction (shimmering).

RT air pollution  
atmospheric optics  
clarity  
fog  
halos  
light transmission  
low visibility  
mist  
opacity  
optical properties  
transparence  
turbidity  
visibility

### haze detection

GS detection  
. **haze detection**  
RT fog  
forest fire detection  
fumes  
gas detectors  
mist  
remote sensors  
smoke  
vapors

### HBNQ

USE **nitroguanidine**

### HBWR reactor

USE **Halden Boiling Water Reactor**

### HC-1 helicopter

USE **CH-47 helicopter**

### HC-3 helicopter

UF *Omnipol HC-3 helicopter*  
GS general aviation aircraft  
. **HC-3 helicopter**  
transport aircraft  
. **HC-3 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **HC-3 helicopter**  
RT passenger aircraft

### HCL argon lasers

DEF Gas lasers in which the active material is gaseous hydrogen chloride and argon.

GS stimulated emission devices  
. lasers  
. . chemical lasers  
. . . HCL lasers  
. . . . **HCL argon lasers**  
. . gas lasers  
. . . HCL lasers  
. . . . **HCL argon lasers**

### HCL lasers

DEF Gas lasers in which the active material is gaseous hydrogen chloride. Used for hydrogen chloride lasers.

UF *hydrogen chloride lasers*  
GS stimulated emission devices  
. lasers  
. . chemical lasers  
. . . **HCL lasers**  
. . . . HCL argon lasers  
. . gas lasers  
. . . **HCL lasers**  
. . . . HCL argon lasers

### HCMM

USE **Heat Capacity Mapping Mission**

### HCN lasers

UF *hydrogen cyanide lasers*  
GS stimulated emission devices  
. lasers  
. . gas lasers  
. . . **HCN lasers**  
RT chemical lasers  
coherent light  
hydrocyanic acid

light amplifiers  
light sources  
optical pumping  
stimulated emission

*HD-1 ground effect machines*

USE **hovercraft ground effect machines**

*HDL (computers)*

USE **hardware description languages**

*HDTV*

USE **high definition television**

#### head (anatomy)

GS anatomy  
. **head (anatomy)**  
.. skull  
... cranium  
... intracranial cavity  
... mastoids  
RT brain  
chin  
eye (anatomy)  
face (anatomy)  
forehead  
lips (anatomy)  
nose (anatomy)  
sense organs

#### head (fluid mechanics)

GS fluid flow  
. **head (fluid mechanics)**  
.. head flow  
.. pressure heads  
RT elevation  
geopotential height  
hydrostatic pressure  
hydrostatics  
liquid flow  
pressure  
scale height

*head (pressure)*

USE **pressure heads**

#### head down tilt

GS posture  
. **head down tilt**  
RT aerospace medicine  
bed rest  
bioastronautics  
body sway test  
head up tilt  
hemodynamic responses  
hindlimb suspension  
hypokinesia  
orthostatic tolerance  
physiological effects  
tilt-table test  
vestibular tests  
weightlessness simulation

#### head flow

GS fluid flow  
. head (fluid mechanics)  
.. **head flow**  
RT base flow  
Blasius flow  
inlet flow  
liquid flow  
∞ pressure drop

#### head movement

RT acceleration stresses (physiology)  
aerospace medicine  
eye movements  
∞ motion  
motion sickness  
vestibular tests

#### head up tilt

*(added March 1998)*

DEF Body posture while lying on a tilt table with the head higher than the rest of the body.

UF *HUT (physiology)*

GS posture

. **head up tilt**

RT aerospace medicine  
bed rest

bioastronautics  
cardiovascular system  
gravitational physiology  
gravity perception  
head down tilt  
hemodynamic responses  
hindlimb suspension  
lower body negative pressure  
orthostatic tolerance  
physiological responses  
supine position  
tilt-table test  
weightlessness simulation

#### headache

UF *cephalalgia*  
GS diseases  
. **headache**  
signs and symptoms  
. **headache**

#### ∞ headers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT beams (supports)  
chassis  
hermetic seals  
pipes (tubes)  
supports  
∞ terminals

*headsets*

USE **earphones**

#### head-up displays

GS display devices  
. **head-up displays**  
RT avionics  
consoles  
flight instruments  
image tubes  
indicating instruments  
landing aids  
navigation aids  
position indicators  
spacecraft position indicators  
warning systems

#### healing

GS **healing**  
. wound healing  
RT clinical medicine  
cures  
therapy

#### health

GS **health**  
. health physics  
.. public health  
.. mental health  
RT chronic conditions  
clinical medicine  
hygiene  
oral hygiene  
psychotherapy  
sanitation

*health and usage monitoring systems (added April 2001)*

USE **systems health monitoring**

#### health physics

GS biophysics  
. **health physics**  
.. public health  
health  
. **health physics**  
.. public health  
RT fluence  
industrial safety  
nuclear medicine  
nuclear physics  
nuclear radiation  
occupational diseases  
∞ physics  
radiation detectors  
radiation dosage  
radiation effects  
radiation hazards  
radiation injuries

radiation measuring instruments  
radiation protection  
radiation sickness  
radiobiology  
safety factors  
∞ science

#### Health Physics Research Reactor

UF *HPRR*

GS nuclear reactors  
. nuclear research and test reactors

.. **Health Physics Research Reactor**

RT ∞ physics

*Health-Education Telecommunications exp*

USE **HET experiment**

#### HEAO

UF *High Energy Astronomy Observatories*

GS artificial satellites  
. scientific satellites  
.. astronomical satellites  
... **HEAO**  
.... HEAO 1  
.... HEAO 2  
.... HEAO 3  
.... HEAO 4  
observatories  
. astronomical observatories  
.. astronomical satellites  
... **HEAO**  
.... HEAO 1  
.... HEAO 2  
.... HEAO 3  
.... HEAO 4  
RT OAO

#### HEAO 1

DEF The first of three NASA High Energy Astronomy Observatories launched during 1977 for the study of cosmic rays and Earth's magnetic field to study the x ray and gamma ray sky. Used for HEAO A, High Energy Astronomy Observatory A, and High Energy Astronomy Observatory 1.

UF *HEAO A*

*High Energy Astronomy Observatory 1*

*High Energy Astronomy Observatory A*

GS artificial satellites  
. scientific satellites  
.. astronomical satellites  
... **HEAO**  
.... **HEAO 1**  
observatories  
. astronomical observatories  
.. astronomical satellites  
... **HEAO**  
.... **HEAO 1**  
unmanned spacecraft  
. **HEAO 1**  
RT OAO

#### HEAO 2

DEF The second of three NASA High Energy Astronomy Observatories. It was launched during 1978 for the study of specific x ray objects, quasars, x ray pulsars, and candidate black holes. Used for Einstein Observatory, HEAO B, High Energy Astronomy Observatory B, and High Energy Astronomy Observatory 2.

UF *Einstein Observatory*

*HEAO B*

*High Energy Astronomy Observatory 2*

*High Energy Astronomy Observatory B*

GS artificial satellites  
. scientific satellites  
.. astronomical satellites  
... **HEAO**  
.... **HEAO 2**  
observatories  
. astronomical observatories  
.. astronomical satellites  
... **HEAO**  
.... **HEAO 2**



## HEAO 3

unmanned spacecraft  
. **HEAO 2**  
RT OAO

**HEAO 3**  
DEF The third of four NASA High Energy Astronomy Observatories. It was launched during 1979 for the study of cosmic rays and elemental and isotropic composition as a corollary to a search of narrow gamma ray lines. Used for HEAO C, High Energy Astronomy Observatory C, and High Energy Astronomy Observatory 3.  
UF *HEAO C*  
*High Energy Astronomy Observatory 3*  
*High Energy Astronomy Observatory C*

GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . HEAO  
. . . . **HEAO 3**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . HEAO  
. . . . **HEAO 3**  
unmanned spacecraft  
. **HEAO 3**  
RT OAO

**HEAO 4**  
(added May 1997)  
UF *HEAO D*  
*High Energy Astronomy Observatory 4*  
*High Energy Astronomy Observatory D*

GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . HEAO  
. . . . **HEAO 4**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . HEAO  
. . . . **HEAO 4**  
RT gamma ray astronomy  
x ray astronomy

*HEAO A*  
USE **HEAO 1**

*HEAO B*  
USE **HEAO 2**

*HEAO C*  
USE **HEAO 3**

*HEAO D*  
(added May 1997)  
USE **HEAO 4**

**hearing**  
GS **hearing**  
. binaural hearing  
RT audiology  
audiometry  
auditory fatigue  
auditory tasks  
ear  
loudness  
stereophonics  
thresholds (perception)

*hearing loss*  
USE **auditory defects**

**heart**  
GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . . **heart**  
. . . . . cardiac auricles  
. . . . . cardiac ventricles  
. . . . . epicardium  
. . . . . heart conduction system  
. . . . . myocardium

RT aorta  
artificial cardiac pacemaker  
artificial heart valves  
blood  
blood pumps  
cardiograms  
cardiography  
cardiology  
cardiotachometers  
coronary circulation  
diastole  
muscles  
phonocardiography

**heart conduction system**  
(added August 2004)  
DEF An impulse-conducting system composed of modified cardiac muscle and having the power of spontaneous rhythmicity and conduction more highly developed than the rest of the heart.  
GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . . heart  
. . . . . **heart conduction system**  
RT artificial cardiac pacemaker  
blood circulation  
heart function  
myocardium

**heart diseases**  
GS diseases  
. **heart diseases**  
. . . angina pectoris  
. . . coronary artery disease  
. . . infarction  
. . . . myocardial infarction  
RT bradycardia  
cardiography  
cardiology  
cardiovascular system  
echocardiography  
electrocardiography  
fat embolisms  
fibrillation  
His bundle  
phonocardiography

**heart function**  
GS **heart function**  
. diastole  
. fibrillation  
. systole  
RT angina pectoris  
blood circulation  
blood pressure  
cardiac output  
cardiography  
carotid sinus reflex  
cyanosis  
echocardiography  
heart conduction system  
heart minute volume  
heart rate  
hemodynamics  
His bundle  
physiology  
stroke volume

**heart implantation**  
GS implantation  
. **heart implantation**  
RT artificial heart valves  
biotechnology  
blood circulation  
pulmonary circulation  
surgery  
transplantation

**heart minute volume**  
GS output  
. cardiac output  
. . . **heart minute volume**  
RT heart function  
spirometers

**heart rate**  
UF *pulse (cardiovascular)*  
GS rates (per time)

. **heart rate**  
. . . arrhythmia  
. . . bradycardia  
. . . tachycardia  
RT angina pectoris  
baroreflexes  
biofeedback  
biomedical data  
cardiac output  
cardiology  
diastole  
epinephrine  
heart function  
Hering-Breuer reflex  
sphygmography  
stroke volume  
systole

**heart valves**  
GS valves  
. **heart valves**  
. . . artificial heart valves  
RT coronary circulation

**hearths**  
RT furnaces  
refractories

**heat**  
DEF Energy transferred by a thermal process.  
GS **heat**  
. dry heat  
. enthalpy  
. . . Gibbs free energy  
. . . heat of dissociation  
. . . heat of formation  
. . . heat of solution  
. . . latent heat  
. . . . heat of fusion  
. . . . heat of vaporization  
. . . heat of combustion  
. nuclear heat  
. process heat  
. specific heat  
RT activation energy  
∞ energy  
entropy  
heating  
heating equipment  
infrared radiation  
temperature  
thermal energy  
thermal insulation  
thermal radiation  
thermochemistry  
thermodynamic properties  
thermodynamics  
work

**heat acclimatization**  
GS adaptation  
. acclimatization  
. . . **heat acclimatization**  
RT body temperature  
cold acclimatization  
high temperature environments  
human tolerances  
perspiration  
physiological effects

**heat affected zone**  
DEF That portion of the base metal, the structure or properties of which have been altered by the heat of welding or gas-cutting operation. Used for HAZ (metallurgy).  
UF *HAZ (metallurgy)*  
RT arc welding  
gas tungsten arc welding  
heat treatment  
metal bonding  
∞ metallurgy  
metal-metal bonding  
soldering  
temperature dependence  
temperature effects  
thermomechanical treatment  
weldability

welding

**heat balance**

DEF The equilibrium which exists on the average between the radiation received by a planet and its atmosphere from the sun and that emitted by the planet and the atmosphere. The equilibrium which is known to exist when all sources of heat gain and loss for a given region of body are accounted for. In general, this balance includes advective or evaporative terms as well as a radiation term.

GS balance

. **heat balance**

RT atmospheric heat budget  
boilers  
combustion  
material balance  
pyrometallurgy  
thermochemical properties  
thermochemistry  
thermodynamic properties

**heat budget**

DEF The accounting for the total amount of heat received and lost by a particular system.

GS energy budgets

. **heat budget**

. . atmospheric heat budget

RT ∞ budgets

Earth radiation budget  
specific heat

**heat capacity**USE **specific heat****Heat Capacity Mapping Mission**UF *HCMM*

RT Applications Explorer Satellites  
geography  
mapping  
∞ missions  
planetary mapping  
thermal mapping

**heat conduction**USE **conductive heat transfer****heat content**USE **enthalpy****heat dissipation**USE **cooling****heat dissipation chilling**USE **cooling****heat effects**USE **temperature effects****heat engines***(added September 1992)*

RT ceramics  
energy technology  
engines  
thermodynamic cycles

**heat equations**USE **thermodynamics****heat exchangers**

DEF Devices for transferring heat from one fluid to another without intermixing the fluids, as a regenerator and, an apparatus for cooling or heating the air in a wind tunnel.

GS **heat exchangers**

. tube heat exchangers

RT condensers (liquefiers)  
coolants  
cooling  
cooling fins  
cooling systems  
counterflow  
evaporators  
∞ exchangers  
finned bodies  
gas cooling  
geothermal energy extraction  
heating  
heating equipment  
regenerative cooling

regenerators

SNAP

SNAP 1

SNAP 2

SNAP 8

SNAP 10A

space cooling (buildings)

space power reactors

space power unit reactors

waste heat

water heating

**heat flow**USE **heat transmission****heat flux**

SN (LIMITED TO HEAT ENERGY TRANSMISSION RATE)

DEF The thermal intensity indicated by the amount of energy transmitted per unit area.

GS rates (per time)

. flux (rate)

. . **heat flux**

RT flux density

solar flux

**heat gain**USE **heating****heat generation**

SN (EXCLUDES BIOLOGICAL PRODUCTION OF HEAT)

RT cogeneration  
combustion  
direct power generators  
∞ generation  
heating  
heating equipment  
process heat  
solid propellant combustion

**heat islands**

RT cities  
climatology  
urban planning  
weather modification

**heat measurement**

UF *calorimetry*  
RT bolometers  
bomb calorimeters  
calorimeters  
drop calorimeters  
enthalpy  
flame calorimeters  
∞ measurement  
shell anodes

**heat of combustion**

UF *combustion heat*  
GS chemical properties  
. thermochemical properties  
. . **heat of combustion**  
heat  
. **heat of combustion**  
thermodynamic properties  
. thermochemical properties  
. . **heat of combustion**  
RT combustion physics  
guns (ordnance)

**heat of dissociation**

GS chemical properties  
. thermochemical properties  
. . **heat of dissociation**  
heat  
. enthalpy  
. . **heat of dissociation**  
thermodynamic properties  
. enthalpy  
. . **heat of dissociation**  
thermochemical properties  
. . **heat of dissociation**  
RT chemical equilibrium  
dissociation  
∞ equilibrium  
reaction kinetics  
thermal dissociation  
thermochemistry

thermodynamic equilibrium

**heat of formation**

UF *formation heat*  
GS chemical properties  
. thermochemical properties  
. . **heat of formation**  
heat  
. enthalpy  
. . **heat of formation**  
thermodynamic properties  
. enthalpy  
. . **heat of formation**  
thermochemical properties  
. . **heat of formation**

**heat of fusion**

DEF The increase in enthalpy accompanying the conversion of one mole, or a unit mass, of a solid to a liquid at its melting point at constant pressure and temperature. Used for latent heat of fusion.

UF *fusion heat*. *latent heat of fusion*

GS chemical properties  
. thermochemical properties  
. . latent heat  
. . . **heat of fusion**

heat

. enthalpy  
. . latent heat  
. . . **heat of fusion**  
thermodynamic properties  
. enthalpy  
. . latent heat  
. . . **heat of fusion**  
thermochemical properties  
. . latent heat  
. . . **heat of fusion**  
thermophysical properties  
. . latent heat  
. . . **heat of fusion**

RT fusion (melting)  
melting  
phase change materials  
phase diagrams  
phase transformations  
specific heat  
thermal energy  
thermochemistry  
thermodynamics  
transition temperature

**heat of solution**

GS chemical properties  
. thermochemical properties  
. . **heat of solution**  
heat  
. enthalpy  
. . **heat of solution**  
thermodynamic properties  
. enthalpy  
. . **heat of solution**  
thermochemical properties  
. . **heat of solution**  
thermophysical properties  
. . **heat of solution**  
RT molecular energy levels  
thermal energy  
thermochemistry  
thermodynamics

**heat of vaporization**

UF *vaporization heat*  
GS chemical properties  
. thermochemical properties  
. . latent heat  
. . . **heat of vaporization**  
heat  
. enthalpy  
. . latent heat  
. . . **heat of vaporization**  
thermodynamic properties  
. enthalpy  
. . latent heat  
. . . **heat of vaporization**  
thermochemical properties  
. . latent heat  
. . . **heat of vaporization**  
thermophysical properties

## heat pipes

. . latent heat  
. . . **heat of vaporization**  
RT vaporizing

### heat pipes

SN (EXCLUDES PIPES AND TUBES USED FOR THE TRANSMISSION OF HEATED LIQUIDS OR GASES)  
RT geothermal energy utilization  
spacecraft temperature

### heat pumps

RT air conditioning  
air conditioning equipment  
condensers (liquefiers)  
cooling systems  
geothermal energy extraction  
heating equipment  
pumps  
refrigerating machinery  
residential energy  
space cooling (buildings)  
thermoelectric cooling  
waste heat

### heat radiators

UF *condenser radiators*  
*heat rejection devices*  
GS **heat radiators**  
. spacecraft radiators  
RT black body radiation  
cooling  
cooling fins  
cooling systems  
heating equipment  
∞ insulated structures  
radiative heat transfer  
∞ radiators  
Stefan-Boltzmann law

### heat regulation

USE **temperature control**

### heat rejection devices

USE **heat radiators**

### heat resistance

USE **thermal resistance**

### heat resistant alloys

DEF Alloys developed for very high temperature service where relatively high stresses (tensile, thermal, vibratory, and shock) are encountered and where oxidation resistance is frequently required. Used for high temperature alloys and superalloys.

UF *high temperature alloys*  
*superalloys*

GS alloys

. **heat resistant alloys**  
. . . nimonic alloys  
. . . refractory metal alloys  
. . . molybdenum alloys  
. . . . Rene 41  
. . . . Rene 63  
. . . . Rene 77  
. . . . Rene 95  
. . . niobium alloys  
. . . osmium alloys  
. . . rhenium alloys  
. . . tantalum alloys  
. . . tungsten alloys  
. . . Udimet alloys  
. . . Waspaloy

RT

aluminides  
cermets  
chromium alloys  
cobalt alloys  
dispersion strengthening  
hafnium alloys  
nickel alloys  
oxide dispersion strengthening  
refractory metals  
sulfidation  
superplasticity

### heat shielding

DEF The use of devices that protect something from heat. Specifically, the protective structure necessary to protect a reentry body from

aerodynamic heating. Used for thermal shielding.

UF *thermal shielding*  
GS shielding  
. **heat shielding**  
. . reentry shielding  
. . reusable heat shielding  
RT ablation  
ablative materials  
ablative nose cones  
cooling  
infrared suppression  
∞ insulated structures  
Ludox (trademark)  
pyrolytic graphite  
solar reflectors  
spacecraft shielding  
temperature  
temperature control  
thermal control coatings  
thermal insulation  
thermal protection

### heat sinks

UF *thermal sinks*  
GS sinks  
. **heat sinks**  
RT ablative materials  
absorbers (materials)  
cooling systems  
endothermic reactions  
energy absorption  
reentry shielding  
regenerators  
thermal absorption  
thermal insulation

### heat sources

UF *hydraulic heating sources*  
GS **heat sources**  
. thermal resources  
. . geothermal resources  
. . . geysers  
. . radioisotope heat sources  
RT ∞ energy sources  
energy storage  
engines  
geothermal technology  
laser heating  
light sources  
∞ power supplies  
radiation sources  
thermodynamic efficiency

### heat storage

UF *thermal energy storage*  
GS energy storage  
. **heat storage**  
RT geothermal energy utilization  
heat tapes  
phase change materials  
solar dynamic power systems  
solar houses  
temperature  
Trombe walls

### heat stroke

RT body temperature  
heat tolerance  
hot weather  
hyperthermia  
physiological effects  
thermal comfort  
thermal environments

### heat tapes

RT heat storage  
ice prevention  
∞ tapes

### heat tests

USE **high temperature tests**

### heat tolerance

GS tolerances (physiology)  
. **heat tolerance**  
RT body temperature  
cold tolerance  
heat stroke

human tolerances

### heat transfer

SN (TRANSMISSION ACROSS AN INTERFACE)  
DEF The transfer or exchange of heat by radiation, conduction, or convection with a substance and between the substance and its surroundings. Used for nonadiabatic processes.

UF *nonadiabatic processes*  
GS transmission

. heat transmission  
. . **heat transfer**  
. . . aerodynamic heat transfer  
. . . . hypersonic heat transfer  
. . . . supersonic heat transfer  
. . . . conductive heat transfer  
. . . . convective heat transfer  
. . . . laminar heat transfer  
. . . . radiative heat transfer  
. . . . turbulent heat transfer

RT

advection  
atmospheric heat budget  
baths  
Biot number  
boiling  
Boussinesq approximation  
capillary pumped loops  
chemical engineering  
compressibility effects  
∞ conduction  
cooling  
counterflow  
cryogenic cooling  
diffuse radiation  
dimensionless numbers  
energy transfer  
film boiling  
film condensation  
flat plates  
fluid boundaries  
forced convection  
gas transport  
gas-liquid interactions  
gas-solid interfaces  
geothermal energy conversion  
geothermal technology  
heating  
hot surfaces  
Leidenfrost phenomenon  
Lewis numbers  
liquid-liquid interfaces  
liquid-solid interfaces  
liquid-vapor interfaces  
mass transfer  
mechanical engineering  
metal vapors  
nonadiabatic conditions  
nongray gas  
nonisothermal processes  
nucleate boiling  
Nusselt number  
Peclet number  
phase change materials  
Prandtl number  
radiative transfer  
Rayleigh equations  
reusable heat shielding  
stagnation point  
Stanton number  
temperature profiles  
temperature ratio  
temperature sensitive paints  
thermal diffusion  
thermal expansion  
thermal insulation  
thermal pollution  
thermoacoustic effects  
thermodynamics  
thermomigration  
transferring  
transport properties  
waste energy utilization

### heat transfer coefficients

SN (HEAT FLUX PER UNIT AREA PER UNIT TEMPERATURE DIFFERENCE)  
DEF The rate of heat transfer per unit area per unit temperature difference, a quantity having the dimensions of reciprocal length.

- GS coefficients  
 . **heat transfer coefficients**
- RT accommodation coefficient  
 evaporation rate  
 heating  
 mass flow factors  
 nucleate boiling
- heat transmission**  
 DEF Heat transmitted from one substance to another. Used for heat flow.  
 UF *heat flow*  
 GS transmission  
 . **heat transmission**  
 . . heat transfer  
 . . . aerodynamic heat transfer  
 . . . . hypersonic heat transfer  
 . . . . supersonic heat transfer  
 . . . conductive heat transfer  
 . . . convective heat transfer  
 . . . laminar heat transfer  
 . . . radiative heat transfer  
 . . . turbulent heat transfer
- RT adiabatic equations  
 annular flow  
 convection  
 convective flow  
 ducted flow  
 equilibrium flow  
 ∞ flow  
 fluid flow  
 geophysics  
 geothermal energy conversion  
 geothermal energy extraction  
 geothermal resources  
 mass flow factors  
 nonequilibrium flow  
 potential flow  
 radial flow  
 radiative transfer  
 steady flow  
 thermal analysis  
 thermal insulation  
 thermohydraulics  
 uniform flow  
 unsteady flow  
 wall flow
- heat treatment**  
 DEF Heating and cooling a solid metal or alloy in such a way as to obtain desired conditions or properties.  
 GS **heat treatment**  
 . annealing  
 . . laser annealing  
 . . pulse heating  
 . maraging  
 . nitriding  
 . normalizing (heat treatment)  
 . stress relieving  
 . tempering
- RT aging (metallurgy)  
 alloys  
 baking  
 critical temperature  
 ferritic stainless steels  
 forging  
 furnaces  
 graphitization  
 hardeners  
 hardening (materials)  
 heat affected zone  
 heating  
 martensite  
 ∞ metallurgy  
 microstructure  
 nucleation  
 phase diagrams  
 precipitation hardening  
 quenching (cooling)  
 recrystallization  
 salt baths  
 ∞ soaking  
 ∞ stabilization  
 supercooling  
 supersaturation  
 temper (metallurgy)  
 temperature distribution  
 thermochemistry
- thermomechanical treatment  
 ∞ treatment
- ∞ **heaters**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED CONSULT THE TERMS LISTED BELOW)  
 RT deicers  
 deicing  
 electron tubes  
 heating equipment  
 vaporizers  
 water heating
- heating**  
 UF *heat gain*  
*preheating*  
*reheating*  
*warming*  
 GS **heating**  
 . arc heating  
 . atmospheric heating  
 . . global warming  
 . . stratospheric warming  
 . baking  
 . base heating  
 . gas heating  
 . induction heating  
 . ionospheric heating  
 . kinetic heating  
 . . aerodynamic heating  
 . . . shock heating  
 . laser heating  
 . magnetohydrodynamic shear heating  
 . pasteurizing  
 . plasma heating  
 . . electron cyclotron heating  
 . radiant heating  
 . radio frequency heating  
 . resistance heating  
 . solar heating  
 . space heating (buildings)  
 . superheating  
 . transient heating  
 . . pulse heating  
 . . shock heating  
 . water heating
- RT air conditioning  
 annealing  
 autoclaving  
 boiling  
 cementation  
 ∞ conduction  
 convection  
 cooling  
 decarburization  
 defrosting  
 environmental engineering  
 geothermal energy extraction  
 geothermal energy utilization  
 heat  
 heat exchangers  
 heat generation  
 heat transfer  
 heat transfer coefficients  
 heat treatment  
 heating equipment  
 Hilsch tubes  
 hydrothermal systems  
 ice prevention  
 integrated energy systems  
 jackets  
 laser annealing  
 laser welding  
 melting  
 Modular Integrated Utility System  
 ∞ radiation  
 roasting  
 sintering  
 ∞ soaking  
 temperature  
 temperature control  
 temperature distribution  
 thermal cycling tests  
 thermal shock  
 thermal stresses  
 vaporizing
- waste energy utilization
- heating equipment**  
 UF *Gerdien arc heaters*  
*preheaters*  
 GS **heating equipment**  
 . boilers  
 . furnaces  
 . . electric furnaces  
 . . image furnaces  
 . . solar furnaces  
 . . vacuum furnaces  
 . ovens  
 . vaporizers  
 . . evaporators
- RT air conditioning  
 air conditioning equipment  
 crucibles  
 deicers  
 deicing  
 ∞ electric equipment  
 ∞ equipment  
 fuel tanks  
 heat  
 heat exchangers  
 heat generation  
 heat pumps  
 heat radiators  
 ∞ heaters  
 heating  
 onboard equipment  
 space heating (buildings)  
 temperature control  
 thermal insulation  
 water heating
- heaving**  
 RT bending  
 ∞ bows  
 buckling  
 displacement  
 distortion  
 flexing  
 kinking  
 ∞ motion  
 pitch (inclination)  
 warpage
- heavy cosmic ray primaries*  
 USE **heavy nuclei**  
**primary cosmic rays**
- heavy elements**  
 GS chemical elements  
 . **heavy elements**  
 RT ∞ elements  
 heavy ions
- heavy fermion superconductors**  
*(added April 1999)*  
 GS conductors  
 . superconductors (materials)  
 . . **heavy fermion superconductors**  
 intermetallics  
 . heavy fermion systems  
 . . **heavy fermion superconductors**
- heavy fermion systems**  
*(added April 1999)*  
 GS intermetallics  
 . **heavy fermion systems**  
 . . heavy fermion superconductors
- RT fermions  
 superconductors (materials)
- heavy ion collisions*  
 USE **ionic collisions**
- heavy ions**  
 GS ions  
 . **heavy ions**  
 RT heavy elements  
 ion stripping  
 isotope separation  
 isotopes  
 light ions
- heavy lift airships**  
 DEF Airships designed to lift heavy materials.

## heavy lift helicopters

- GS airships
  - . **heavy lift airships**
- RT materials handling rotors

### heavy lift helicopters

- GS V/STOL aircraft
  - . rotary wing aircraft
  - . . . helicopters
  - . . . . **heavy lift helicopters**
  - . . . . . CH-62 helicopter
- RT air cargo
  - ∞ aircraft
  - cargo aircraft
  - helicopter design

### heavy lift launch vehicles

- UF *HLLV*
- GS launch vehicles
  - . **heavy lift launch vehicles**
  - . . Ares 5 cargo launch vehicle
  - . . Delta 4 Heavy launch vehicle
  - . . Energiya launch vehicle
  - . . Proton launch vehicle
- RT Advanced Launch System (STS)  
Long March launch vehicles  
rocket engines
  - ∞ rockets
  - spacecraft launching
  - ∞ vehicles

### heavy metals

- (added July 1999)
- DEF Metals or alloys having a high specific gravity; usually ones with a density greater than 5 grams per cubic centimeter.
- GS metals
  - . **heavy metals**
  - RT cadmium
  - chromium
  - contaminants
  - copper
  - industrial wastes
  - lead (metal)
  - mercury (metal)
  - soil pollution
  - toxic hazards
  - zinc

### heavy nuclei

- UF *heavy cosmic ray primaries*
- GS particles
  - . charged particles
  - . . energetic particles
  - . . . nuclei (nuclear physics)
  - . . . . **heavy nuclei**
  - . . . . . corpuscular radiation
  - . . . . . energetic particles
  - . . . . . nuclei (nuclear physics)
  - . . . . . **heavy nuclei**
- RT primary cosmic rays

### heavy water

- DEF Water in which the hydrogen of the water molecule consists entirely of the heavy hydrogen isotope of mass 2 (deuterium). Used for deuterium oxides and hydrogen deuterium oxide.
- UF *deuterium oxides*  
*hydrogen deuterium oxide*
- GS chalcogenides
  - . oxides
  - . . **heavy water**
  - hydrogen compounds
  - . deuterium compounds
  - . . **heavy water**
  - water
    - . **heavy water**
- RT deuterium  
moderators  
tritium

### heavy water components test reactors

- GS nuclear reactors
  - . liquid cooled reactors
  - . . water cooled reactors
  - . . . heavy water reactors
  - . . . . **heavy water components test reactors**
  - . nuclear research and test reactors

- . . **heavy water components test reactors**
- . water moderated reactors
- . . **heavy water components test reactors**

### heavy water reactors

- GS nuclear reactors
  - . liquid cooled reactors
  - . . water cooled reactors
  - . . . **heavy water reactors**
  - . . . . heavy water components test reactors
  - . . . . . plutonium recycle test reactor
  - . . . . . zero power reactor 2
- RT light water breeder reactors

### HEF (high energy fuels)

- USE **high energy fuels**

### height

- DEF Vertical distance; the distance above some reference point or plane, as, height above sea level. The vertical dimension of anything; the distance which something extends above its foot or root, as blade height.
- GS dimensions
  - . **height**
  - . . scale height
- RT altitude  
depth  
distance  
geopotential
  - ∞ level
  - slopes

### Heinkel aircraft

- RT ∞ aircraft

### Heisenberg theory

- GS atomic theory
  - . **Heisenberg theory**
- RT atomic excitations  
Dyson theory  
energy transfer
  - ∞ theories

### Helene

- (added January 1996)
- DEF A natural satellite of Saturn orbiting at a mean distance of 377,400 kilometers.
- GS celestial bodies
  - . natural satellites
  - . . Saturn satellites
  - . . . **Helene**
- RT Saturn (planet)

### helical antennas

- DEF Antennas used where circular polarization is required. The driven element consists of a helix supported above a ground plane.
- GS antennas
  - . directional antennas
  - . . **helical antennas**
- RT antenna design
  - ∞ helices
  - microwave antennas

### helical flow

- GS fluid flow
  - . **helical flow**
- RT axisymmetric flow  
flow geometry
  - ∞ helices
  - magnetohydrodynamic stability
  - three dimensional flow

### helical inducers

- GS intake systems
  - . **helical inducers**
- RT field coils
  - ∞ helices
  - plasma control

### helical windings

- GS winding
  - . **helical windings**
- RT ∞ helices  
magnetic field configurations  
plasma control

stellarators

### ∞ helices

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT curves (geometry)  
helical antennas  
helical flow  
helical inducers  
helical windings
- ∞ spirals

### helicopter attitude indicators

- USE **attitude indicators**

### helicopter control

- GS aircraft control
  - . **helicopter control**
- RT airborne radar approach  
attitude control  
automatic control
  - ∞ control
  - controllability
  - directional control
  - flight control
  - harmonic control
  - helicopters
  - lateral control
  - longitudinal control
  - manual control
  - speed control
  - tail rotors

### helicopter design

- GS aircraft design
  - . **helicopter design**
- RT compound helicopters  
computer aided design
  - ∞ design
  - engine design
  - heavy lift helicopters
  - helicopters
  - product development
  - rotor body interactions
  - streamlining
  - structural design
  - UH-60A helicopter
  - UH-61A helicopter
  - whirl towers

### helicopter engines

- GS engines
  - . aircraft engines
  - . . **helicopter engines**
  - . . . internal combustion engines
  - . . . **helicopter engines**
- RT convertible fan-shaft engines  
helicopters  
jet engines  
T-53 engine  
T-55 engine  
T-58 engine  
T-63 engine  
T-64 engine  
T-74 engine  
T-76 engine

### helicopter impulsive noise

- USE **blade slap noise**

### helicopter performance

- GS aircraft performance
  - . **helicopter performance**
- RT aerodynamic stability  
aircraft reliability  
controllability  
Cooper-Harper ratings  
flight characteristics  
flight envelopes  
helicopters  
maneuverability  
pilot ratings

### helicopter propeller drive

- GS mechanical drives
  - . propeller drive
  - . . **helicopter propeller drive**
- RT helicopters  
jet propulsion  
rotary wings

- tilted propellers
- variable pitch propellers
- helicopter rotors*
- USE **rotary wings**
- helicopter tail rotors**
  - GS rotating bodies
    - . rotors
    - . tail rotors
    - . . . **helicopter tail rotors**
  - RT helicopters
    - rotary wings
    - ∞ rotor blades
- helicopter wakes**
  - GS wakes
    - . aircraft wakes
    - . . . **helicopter wakes**
  - RT downwash
    - helicopters
- helicopters**
  - DEF Rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.
  - UF *drone helicopters*  
*gyroplanes*
  - GS V/STOL aircraft
    - . rotary wing aircraft
    - . . . **helicopters**
    - . . . Alouette helicopters
    - . . . . SA-330 helicopter
    - . . . . SE-3160 helicopter
    - . . . . Bell 214A helicopter
    - . . . . compound helicopters
    - . . . . S-67 helicopter
    - . . . . H-17 helicopter
    - . . . . heavy lift helicopters
    - . . . . CH-62 helicopter
    - . . . . light helicopters
    - . . . . OH-4 helicopter
    - . . . . OH-5 helicopter
    - . . . . OH-6 helicopter
    - . . . . OH-58 helicopter
    - . . . . military helicopters
    - . . . . AH-1G helicopter
    - . . . . AH-1S helicopter
    - . . . . AH-1W helicopter
    - . . . . AH-63 helicopter
    - . . . . AH-64 helicopter
    - . . . . BO-105 helicopter
    - . . . . CH-3 helicopter
    - . . . . CH-21 helicopter
    - . . . . CH-34 helicopter
    - . . . . CH-46 helicopter
    - . . . . CH-47 helicopter
    - . . . . CH-54 helicopter
    - . . . . CH-62 helicopter
    - . . . . H-19 helicopter
    - . . . . H-43 helicopter
    - . . . . H-53 helicopter
    - . . . . H-54 helicopter
    - . . . . H-56 helicopter
    - . . . . H-60 Helicopter
    - . . . . HC-3 helicopter
    - . . . . HH-43 helicopter
    - . . . . HH-65 helicopter
    - . . . . OH-4 helicopter
    - . . . . OH-5 helicopter
    - . . . . OH-6 helicopter
    - . . . . OH-13 helicopter
    - . . . . OH-23 helicopter
    - . . . . OH-58 helicopter
    - . . . . P-531 helicopter
    - . . . . QH-50 helicopter
    - . . . . S-67 helicopter
    - . . . . SA-321 helicopter
    - . . . . SA-330 helicopter
    - . . . . SH-3 helicopter
    - . . . . SH-4 helicopter
    - . . . . Sikorsky Whirlwind helicopter
    - . . . . UH-1 helicopter
    - . . . . UH-2 helicopter
    - . . . . UH-34 helicopter
    - . . . . UH-60A helicopter
    - . . . . UH-61A helicopter
    - . . . . Westland Whirlwind helicopter
    - . . . . XV-9A aircraft
    - . . . . rigid rotor helicopters
- . . . . CH-3 helicopter
- . . . . F-28 helicopter
- . . . . XH-51 helicopter
- . . . . S-58 helicopter
- . . . . S-61 helicopter
- . . . . tandem rotor helicopters
- . . . . CH-46 helicopter
- . . . . CH-47 helicopter
- . . . . H-25 helicopter
- . . . . EH-101 helicopter
- . . . . TH-55 helicopter
- RT airborne radar approach
- ∞ aircraft
- aircraft survivability
- blade slap noise
- blade-vortex interaction
- general aviation aircraft
- ground resonance
- helicopter control
- helicopter design
- helicopter engines
- helicopter performance
- helicopter propeller drive
- helicopter tail rotors
- helicopter wakes
- heliports
- ∞ military aircraft
- nap-of-the-earth navigation
- recovery vehicles
- rotor systems research aircraft
- short takeoff aircraft
- ∞ subsonic aircraft
- tilt rotor aircraft
- Tilt Rotor Research Aircraft Program
- utility aircraft
- V-22 aircraft
- vertical takeoff aircraft
- Weser aircraft
- Westland aircraft
- XV-15 aircraft
- Heliliner (helicopter)*  
*(added April 1997)*
- USE **EH-101 helicopter**
- Helio aircraft**
  - UF *Helio military aircraft*
  - GS **Helio aircraft**
    - . U-10 aircraft
  - RT ∞ aircraft
- Helio military aircraft*
- USE **Helio aircraft**
- heliocentric orbits*
- USE **solar orbits**
- heliographs*
- USE **spectroheliographs**
- heliography*
- USE **spectroheliographs**
- heliomagnetism*
- USE **solar magnetic field**
- heliometers**
  - UF *heliometry*
  - GS measuring instruments
    - . **heliometers**
    - . . pyroheliometers
    - optical equipment
    - . **heliometers**
    - . . pyroheliometers
    - telescopes
    - . **heliometers**
    - . . pyroheliometers
- heliometry*
- USE **heliometers**  
**pyroheliometers**
- Helios 1**
  - GS artificial satellites
    - . Helios satellites
    - . . **Helios 1**
    - unmanned spacecraft
    - . space probes
    - . . solar probes
- . . . **Helios 1**
- Helios 2**
  - GS artificial satellites
    - . Helios satellites
    - . . **Helios 2**
    - unmanned spacecraft
    - . space probes
    - . . solar probes
    - . . . **Helios 2**
- Helios A**
  - GS artificial satellites
    - . Helios satellites
    - . . **Helios A**
    - unmanned spacecraft
    - . space probes
    - . . solar probes
    - . . . **Helios A**
- Helios B**
  - GS artificial satellites
    - . Helios satellites
    - . . **Helios B**
    - unmanned spacecraft
    - . space probes
    - . . solar probes
    - . . . **Helios B**
- Helios Project**
  - GS programs
    - . NASA programs
    - . . NASA space programs
    - . . . **Helios Project**
    - . projects
    - . . **Helios Project**
    - . space programs
    - . . NASA space programs
    - . . . **Helios Project**
  - RT charged particles
    - high temperature plasmas
    - solar probes
    - zodiacal light
- Helios satellites**
  - GS artificial satellites
    - . **Helios satellites**
    - . . Helios 1
    - . . Helios 2
    - . . Helios A
    - . . Helios B
  - RT magnetic fields
    - particle flux density
    - solar flux density
- helioseismology**
  - UF *solar dynamics*  
*solar seismology*
  - GS seismology
    - . asteroseismology
    - . . **helioseismology**
  - RT astrophysics
    - ∞ science
    - solar interior
    - solar physics
- heliosphere**
  - DEF The region around the sun whose plasma processes are dominated by solar wind.
  - RT cosmic rays
    - interplanetary space
    - interstellar gas
    - SOHO Mission
    - solar activity effects
    - solar wind
- heliostats**
  - DEF Instruments consisting of mirrors moved by clockwork for reflecting the sun's rays in a fixed direction.
  - RT ∞ instruments
    - mirrors
    - reflectors
    - servomotors
    - solar reflectors
    - synchronizers
- heliotrons**  
*(added September 1988)*
  - GS nuclear reactors

## heliports

- . fusion reactors
- . . . **heliotrons**
- RT plasma control stellarators

## heliports

- DEF An area of land, water, or structure used, or intended to be used, for the landing and takoff of helicopters.
- GS airports
- . **heliports**
- RT air traffic control airport planning airport towers hangars helicopters landing aids landing sites military air facilities navigation aids solar compasses V/STOL aircraft

## helitrons

- GS electron tubes . vacuum tubes . . . microwave tubes . . . traveling wave tubes . . . backward wave tubes . . . . . **helitrons** microwave equipment . microwave tubes . . . traveling wave tubes . . . backward wave tubes . . . . . **helitrons**
- RT carcinotrons

## helium

- GS chemical elements . rare gases . . **helium** . . . helium isotopes . . . liquid helium . . . . . liquid helium 2 gases . rare gases . . **helium** . . . helium isotopes . . . liquid helium . . . . . liquid helium 2
- RT alpha particles helium afterglow helium atoms helium film helium ions Wolf-Rayet stars

## helium 2

- USE **helium isotopes** **liquid helium**

## helium 3

- USE **helium isotopes**

## helium 4

- USE **helium isotopes**

## helium afterglow

- GS afterglows . **helium afterglow**
- RT gas ionization helium plasma decay

## helium atoms

- GS atoms . **helium atoms**
- RT helium

## helium compounds

- RT  $\infty$  rare gas compounds

## helium film

- RT  $\infty$  films helium

## helium hydrogen atmospheres

- GS environments . extraterrestrial environments . . planetary environments . . . planetary atmospheres

## . . . . helium hydrogen atmospheres

## helium ions

- GS ions . **helium ions**
- RT alpha particles helium

## helium isotopes

- UF *helium 2* *helium 3* *helium 4*
- GS chemical elements . nuclides . . isotopes . . . . . **helium isotopes** . rare gases . . helium . . . . . **helium isotopes** gases . rare gases . . helium . . . . . **helium isotopes**

## helium plasma

- GS particles . charged particles . . energetic particles . . . plasmas (physics) . . . . . **helium plasma** . corpuscular radiation . . energetic particles . . . plasmas (physics) . . . . . **helium plasma**
- RT argon plasma electron plasma hydrogen plasma oxygen plasma

## helium stars

- USE **B stars**

## helium-neon lasers

- GS stimulated emission devices . lasers . . gas lasers . . . . . **helium-neon lasers**
- RT laser modes laser outputs

## helium-oxygen atmospheres

- GS controlled atmospheres . **helium-oxygen atmospheres**
- RT aerospace environments  $\infty$  atmospheres  $\infty$  breathing gas mixtures portable life support systems underwater breathing apparatus

## helix tubes

- USE **traveling wave tubes**

## Hellmann-Feynman theorem

- GS theorems . **Hellmann-Feynman theorem**

## helmet mounted displays

- UF *HMD (displays)*
- GS display devices . **helmet mounted displays**
- RT crew workstations  $\infty$  detectors images indicating instruments  $\infty$  instruments monitors personnel

## helmets

- GS clothing . protective clothing . . **helmets** safety devices . **helmets**
- RT armor flight clothing goggles

## pressure suits

## $\infty$ Helmholtz equations

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT  $\infty$  equations Helmholtz vorticity equation Kelvin-Helmholtz instability time dependence wave equations

## Helmholtz resonators

- DEF An enclosure having a small opening consisting of a straight tube of such dimensions that the enclosure resonates at a single frequency determined by the geometry of the resonator.
- GS resonators . **Helmholtz resonators**
- RT cavity resonators noise reduction

## Helmholtz vorticity equation

- GS analysis (mathematics) . real variables . . differential equations . . . partial differential equations . . . . . **Helmholtz vorticity equation** . . . vorticity equations . . . . . **Helmholtz vorticity equation** equations of motion . kinetic equations . . hydrodynamic equations . . . **Helmholtz vorticity equation** flow equations . vorticity equations . . **Helmholtz vorticity equation**
- RT  $\infty$  equations  $\infty$  Helmholtz equations vorticity

## HELOS (satellite)

- USE **Exosat satellite**

## hematite

- DEF A common iron mineral; ferric oxide.
- GS chalcogenides . oxides . . metal oxides . . . iron oxides . . . . . **hematite** iron compounds . iron oxides . . **hematite** minerals . iron ores . . **hematite**

## hematocrit

- RT blood blood cell count blood circulation blood flow blood plasma blood volume erythrocytes hematology hemoglobin

## hematocrit ratio

- GS ratios . **hematocrit ratio**
- RT anemias blood cell count erythrocytes hematology

## hematology

- RT blood cell count carboxyhemoglobin test hematocrit hematocrit ratio reticulocytes

## hematopoiesis

- GS cyto genesis . **hematopoiesis**
- RT blood blood cell count blood cells

- bone marrow  
cardiovascular system  
cells (biology)  
physiological effects  
radiation effects
- hematopoietic system**  
RT angiogenesis  
blood cells  
blood volume  
bone marrow  
cardiovascular system  
physiological effects  
∞ systems
- hematuria**  
GS signs and symptoms  
. **hematuria**  
RT urine
- hemisphere cylinder bodies**  
RT ∞ cylinders  
cylindrical bodies  
hemispherical shells  
pressure vessels
- ∞ **hemispheres**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
RT aerodynamic configurations  
bodies of revolution  
Eastern Hemisphere  
hemispherical shells  
Northern Hemisphere  
Southern Hemisphere  
spheres
- hemispherical shells**  
GS shells (structural forms)  
. **hemispherical shells**  
RT bodies of revolution  
circular shells  
domes (structural forms)  
hemisphere cylinder bodies  
∞ hemispheres  
metal shells  
reinforced shells  
spheres  
spherical shells
- hemocytes**  
GS cells (biology)  
. blood cells  
. . . **hemocytes**  
RT invertebrates
- hemodynamic responses**  
GS physiological effects  
. physiological responses  
. . . **hemodynamic responses**  
responses  
. physiological responses  
. . . **hemodynamic responses**  
RT baroreflexes  
blood circulation  
blood pressure  
head down tilt  
head up tilt  
tilt-table test
- hemodynamics**  
GS **hemodynamics**  
. lower body negative pressure  
RT blood circulation  
blood volume  
cardiovascular system  
∞ dynamics  
heart function  
hemoperfusion  
physiology
- hemoglobin**  
GS biopolymers  
. proteins  
. . . **hemoglobin**  
. . . carboxyhemoglobin  
. . . oxyhemoglobin  
organic compounds  
. proteins  
. . . **hemoglobin**  
. . . carboxyhemoglobin  
. . . oxyhemoglobin  
organometallic compounds  
. **hemoglobin**  
. . . carboxyhemoglobin  
. . . oxyhemoglobin  
anemias  
RT blood  
blood cell count  
blood cells  
cells (biology)  
erythrocytes  
hematocrit  
hemolysis  
polycythemia  
porphines  
porphyrins  
reticulocytes
- hemolysis**  
RT complement (biology)  
erythrocytes  
hemoglobin  
polycythemia  
reticulocytes
- hemoperfusion**  
DEF Type of poison treatment in which the patient's blood is passed over a bed of absorbent material (activated carbon, resin, etc.) to remove the toxin from the bloodstream.  
RT activated carbon  
adsorbents  
blood flow  
blood pressure  
hemodynamics  
toxicology
- hemorrhages**  
GS **hemorrhages**  
. petechia  
RT ∞ bleeding  
blood  
cardiovascular system  
coagulation  
hemostatics  
hypotension  
injuries  
pathology  
polycythemia  
reticulocytes
- hemostasis*  
USE **hemostatics**
- hemostatics**  
UF *hemostasis*  
GS drugs  
. **hemostatics**  
RT blood coagulation  
fibrinogen  
gibberellins  
hemorrhages  
thrombin  
thromboplastin  
vasopressins
- HEMT (electronics)*  
USE **high electron mobility transistors**
- Henry law**  
RT composition (property)  
partial pressure  
Raoult law  
solubility  
solutions  
vapor pressure
- HEOS A satellite**  
GS artificial satellites  
. ESA satellites  
. . . HEOS satellites  
. . . **HEOS A satellite**  
ESA spacecraft  
. ESA satellites  
. . . HEOS satellites  
. . . **HEOS A satellite**
- HEOS B satellite**  
GS artificial satellites
- . ESA satellites  
. . . HEOS satellites  
. . . **HEOS B satellite**  
ESA spacecraft  
. ESA satellites  
. . . HEOS satellites  
. . . **HEOS B satellite**
- HEOS satellites**  
UF *Highly Eccentric Orbit satellites*  
GS artificial satellites  
. ESA satellites  
. . . **HEOS satellites**  
. . . HEOS A satellite  
. . . HEOS B satellite  
ESA spacecraft  
. ESA satellites  
. . . **HEOS satellites**  
. . . HEOS A satellite  
. . . HEOS B satellite  
RT European space programs  
solar orbits
- heparins**  
RT anticoagulants
- hepatitis**  
DEF An inflammation of the liver, commonly of viral origin, but also associated with other diseases.  
GS diseases  
. infectious diseases  
. . . **hepatitis**  
RT acquired immunodeficiency syndrome  
anatomy  
liver  
viral diseases
- heptadiene**  
GS organic compounds  
. hydrocarbons  
. . . aliphatic hydrocarbons  
. . . dienes  
. . . . **heptadiene**
- heptanes**  
GS organic compounds  
. hydrocarbons  
. . . aliphatic hydrocarbons  
. . . alkanes  
. . . . **heptanes**  
RT hydrocarbon fuels
- herbicides**  
DEF Chemical agents used for the eradication of undesirable plants or for the inhibition of their growth.  
RT brush (botany)  
defoliants  
foliage  
forests  
leaves  
plants (botany)  
toxicity  
trees (plants)
- Herbig-Haro objects**  
DEF Celestial objects having many of the characteristics of a T Tauri star (e.g., their spectra show a weak continuum with strong emission lines), believed to be stars in the very early stages of development. All known Herbig-Haro objects have been found within the boundaries of dark clouds. These strong infrared sources are characterized by mass loss.  
GS celestial bodies  
. nebulae  
. . . **Herbig-Haro objects**  
RT B stars  
∞ bodies  
infrared sources (astronomy)  
infrared stars  
stellar radiation  
stellar spectra



## Hercules engine

- T Tauri stars
- Hercules aircraft*
  - USE **C-130 aircraft**
- Hercules engine**
  - GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . **Hercules engine**
  - RT Honest John rocket vehicle
  - Little John rocket vehicle
- Hercules nova**
  - GS celestial bodies
    - . stars
    - . . variable stars
    - . . . novae
    - . . . . **Hercules nova**
  - RT dwarf novae
- heredity**
  - RT breeding (reproduction)
  - congenital anomalies
  - cytogenesis
  - evolution (development)
- Hering-Breuer reflex**
  - GS reflexes
    - . respiratory reflexes
    - . . **Hering-Breuer reflex**
  - RT heart rate
- Hermes manned spaceplane**
  - GS manned spacecraft
    - . space shuttles
    - . . **Hermes manned spaceplane**
  - reentry vehicles
  - . recoverable spacecraft
  - . . reusable spacecraft
  - . . . space shuttles
  - . . . . **Hermes manned spaceplane**
  - RT French space program
  - space transportation system
  - spacecraft design
- Hermes satellite*
  - USE **Communications Technology Satellite**
- hermetic seals**
  - GS seals (stoppers)
    - . **hermetic seals**
  - RT  $\infty$  headers
  - labyrinth seals
  - O ring seals
  - pump seals
- Hermitian polynomial**
  - GS algebra
    - . polynomials
    - . . **Hermitian polynomial**
  - RT Jacobi matrix method
  - matrices (mathematics)
  - real variables
  - vector spaces
- HERO Reactor**
  - GS nuclear reactors
    - . nuclear research and test reactors
    - . . **HERO Reactor**
- Hertzsprung-Russell diagram**
  - UF *HR diagram*
  - GS diagrams
    - . **Hertzsprung-Russell diagram**
  - RT asymptotic giant branch stars
  - color-color diagram
  - color-magnitude diagram
  - horizontal branch stars
  - stellar evolution
  - stellar luminosity
  - stellar spectra
- Herzberg bands**
  - GS spectra
    - . radiation spectra
    - . . absorption spectra
    - . . . **Herzberg bands**
    - . . . . spectral bands
    - . . . . . absorption spectra

- . . . **Herzberg bands**
- RT  $\infty$  bands
- oxygen spectra
- Schumann-Runge bands
- ultraviolet spectra
- Herzegovina*
  - (added June 1996)
  - USE **Bosnia and Herzegovina**
- Hessian matrices**
  - DEF Given a real value function of N variables, an N by N symmetric of all second order partial derivatives.
  - GS algebra
    - . vector spaces
    - . . matrices (mathematics)
    - . . . **Hessian matrices**
  - RT algorithms
  - optimization
- HET experiment**
  - UF *Health-Education Telecommunications exp*
  - GS telecommunication
    - . teleconferencing
    - . . **HET experiment**
  - RT ATS 6
  - communication satellites
  - satellite networks
- heterocyclic compounds**
  - GS organic compounds
    - . cyclic compounds
    - . . **heterocyclic compounds**
    - . . . acriflavine
    - . . . adenosines
      - . . . . adenosine diphosphate
      - . . . . adenosine monophosphate
      - . . . . adenosine triphosphate
      - . . . . cyclic AMP
    - . . . alkaloids
    - . . . atropine
    - . . . betaines
    - . . . caffeine
    - . . . colchicine
    - . . . ergotamine
    - . . . hyoscine
    - . . . lysergine
    - . . . morphine
    - . . . nicotinamide
    - . . . nicotine
    - . . . pilocarpine
    - . . . reserpine
    - . . . strychnine
    - . . . tropanyl compounds
    - . . . anisole
    - . . . ascorbic acid
    - . . . azines
    - . . . cyanurates
    - . . . cyanuric acid
    - . . . meclizine
    - . . . methylene blue
    - . . . phenothiazines
    - . . . azoles
      - . . . . acetazolamide
      - . . . . oxazole
      - . . . . pyrroles
      - . . . . carbazoles
    - . . . azulene
    - . . . bioflavonoids
    - . . . biotin
    - . . . carnitine
    - . . . cyanocobalamin
    - . . . cytidylic acid
    - . . . dimenhydrinate
    - . . . endrin
    - . . . ethylene oxide
    - . . . folic acid
    - . . . furans
    - . . . tetrahydrofuran
    - . . . guanethidine
    - . . . HMX
    - . . . nicotinic acid
    - . . . phthalocyanin
    - . . . phyloquinone
    - . . . piperidine
    - . . . promethazine
    - . . . purines
    - . . . . adenines

- . . . . xanthines
- . . . . . caffeine
- . . . . . guanines
- . . . . . uric acid
- . . . pyridines
- . . . pyridoxine
- . . . pyrimidines
- . . . . alloxan
- . . . . thymidine
- . . . . thymine
- . . . . uracil
- . . . indoles
- . . . RDX
- . . . retinene
- . . . riboflavin
- . . . tetracyclines
- . . . tetrazoles
- . . . thiamine
- . . . thiazine (trademark)
- . . . thiophenes
- . . . tocopherol
- . . . trimethadione
- . . . . tryptamines
- . . . . tryptophan
- . . . . . melatonin
- . . . . . serotonin
- . . . . . imidazoles
- RT  $\infty$  chemical compounds
- heterodyning**
  - DEF Mixing two radio signals of different frequencies to produce a third signal which is of lower frequency; i.e., to produce beating.
  - GS **heterodyning**
    - . optical heterodyning
  - RT autodynes
  - demodulation
  - intermediate frequency amplifiers
  - mixing circuits
  - superheterodyne receivers
- heterogeneity**
  - DEF Having different properties at different points.
  - RT deviation
  - impurities
  - inclusions
  - inhomogeneity
  - range (extremes)
  - sampling
  - standard deviation
  - statistical tests
  - variability
  - variance (statistics)
- heterojunction devices**
  - DEF Electronic devices utilizing junctions between different semiconducting materials. The characteristics and performance of the devices are dependent on the relative lineup of the energy bands at the junctions.
  - GS electronic equipment
    - . solid state devices
    - . . semiconductor devices
    - . . . **heterojunction devices**
    - . . . . high electron mobility transistors
    - . . . . . MODFETS
  - RT band structure of solids
  - distributed feedback lasers
  - gallium arsenides
  - homojunctions
  - ITO (semiconductors)
  - junction diodes
  - modulation doping
  - quantum efficiency
  - quantum well lasers
  - quantum wells
  - semiconductor junctions
  - solar energy conversion
  - waveguide lasers
- heterojunctions**
  - DEF Junctions between semiconductors that differ in their doping level conductivities, and also in their atomic or alloy compositions.
  - GS semiconductor junctions
    - . **heterojunctions**
  - RT homojunctions
  - junction diodes
  - modulation doping

- quantum cascade lasers
  - quantum wells
  - resonant tunneling diodes
  - silicon junctions
  - solar cells
  - thin films
  - tunnel junctions
- heterophoria**
- UF *exophoria*
  - RT vision
- heterosphere**
- DEF The upper portion of a two part division of the atmosphere according to the general homogeneity of atmospheric composition; the layer above the homosphere. The heterosphere is characterized by variation in composition and mean molecular weight of constituent gases. This region starts at 80 to 100 kilometers above the Earth, and therefore closely coincides with the ionosphere and the thermosphere.
  - GS Earth atmosphere
    - . **heterosphere**
    - environments
    - . **heterosphere**
  - RT chemosphere
    - Earth ionosphere
    - Earth magnetosphere
    - exosphere
    - lower atmosphere
    - middle atmosphere
    - thermosphere
    - upper atmosphere
- heterotrophs**
- RT animals
    - autotrophs
    - metabolism
    - plants (botany)
- heuristic methods**
- RT automata theory
    - computer programming
    - greedy algorithms
  - ∞ methodology
    - simulation
    - sorting algorithms
- HEUS rocket engines**
- GS engines
    - . rocket engines
    - . . **HEUS rocket engines**
  - RT rocket engine control
    - rocket vehicles
- Hewlett-Packard computers**
- GS data processing equipment
    - . computers
    - . . digital computers
    - . . . **Hewlett-Packard computers**
- hexadiene**
- GS organic compounds
    - . hydrocarbons
    - . . aliphatic hydrocarbons
    - . . . dienes
    - . . . . **hexadiene**
- hexagonal cells**
- RT ∞ cells
    - crystal lattices
    - honeycomb structures
- hexagons**
- GS geometry
    - . Euclidean geometry
    - . . polygons
    - . . . **hexagons**
- hexahedrite**
- GS magnesium compounds
    - . magnesium sulfates
    - . . **hexahedrite**
    - minerals
    - . **hexahedrite**
    - sulfur compounds
      - . sulfates
      - . . magnesium sulfates
- . . . **hexahedrite**
- hexamethonium**
- RT ammonium compounds
    - anticonvulsants
- hexamethylenetetramine**
- GS organic compounds
    - . amines
    - . . **hexamethylenetetramine**
- hexanitrostilbene**
- UF *HNST*
  - RT stilbene
- hexenes**
- GS organic compounds
    - . hydrocarbons
    - . . aliphatic hydrocarbons
    - . . . alkenes
    - . . . . **hexenes**
  - RT cyclohexane
    - hydrocarbon fuels
- Hexogenes (trademark)**
- GS acids
    - . carboxylic acids
    - . . **Hexogenes (trademark)**
    - organic compounds
      - . carboxylic acids
      - . . **Hexogenes (trademark)**
- hexokinase**
- GS biopolymers
    - . proteins
    - . . enzymes
    - . . . **hexokinase**
    - organic compounds
      - . proteins
      - . . enzymes
      - . . . **hexokinase**
- hexoses**
- GS organic compounds
    - . carbohydrates
    - . . sugars
    - . . . monosaccharides
    - . . . . **hexoses**
    - . . . . . galactose
    - . . . . . glucose
- hexyl compounds**
- GS alkyl compounds
    - . **hexyl compounds**
  - RT ∞ chemical compounds
- HF lasers**
- UF *hydrogen fluoride lasers*
  - GS stimulated emission devices
    - . lasers
    - . . gas lasers
    - . . . **HF lasers**
  - RT chemical lasers
    - infrared lasers
    - TEA lasers
- HFB-320 aircraft**
- UF *Hamburger HFB-320 aircraft*
  - GS Hamburger aircraft
    - . **HFB-320 aircraft**
    - jet aircraft
      - . **HFB-320 aircraft**
      - monoplanes
        - . **HFB-320 aircraft**
        - passenger aircraft
          - . **HFB-320 aircraft**
          - transport aircraft
            - . **HFB-320 aircraft**
    - RT ∞ aircraft
- HFIR*
- USE **high flux isotope reactors**
- HFIR (reactor)*
- USE **high flux isotope reactors**
- HH-43 helicopter**
- UF *HH-43B helicopter*
  - Huskie helicopter*
  - GS Kaman aircraft
    - . **HH-43 helicopter**
- utility aircraft
  - . **HH-43 helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **HH-43 helicopter**
- HH-43B helicopter*
- USE **HH-43 helicopter**
- HH-65 helicopter**
- (added August 1995)
  - GS V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **HH-65 helicopter**
  - RT ∞ aircraft
    - rescue operations
- HHX helicopter*
- USE **H-53 helicopter**
- hibernation**
- RT adaptation
    - thermoregulation
- HICAT (radar technique)*
- USE **high resolution coverage antennas**
- HICAT project*
- USE **high resolution coverage antennas**
- hierarchies**
- GS classifications
    - . **hierarchies**
    - . . BBGKY hierarchy
    - . . dichotomies
- Higgs bosons**
- (added April 1994)
  - GS particles
    - . elementary particles
    - . . bosons
    - . . . **Higgs bosons**
    - . . nuclear particles
    - . . bosons
    - . . . **Higgs bosons**
  - RT broken symmetry
    - electroweak model
    - particle theory
- high acceleration**
- GS rates (per time)
    - . acceleration (physics)
    - . . **high acceleration**
  - RT ∞ acceleration
    - acceleration stresses (physiology)
    - acceleration tolerance
    - electron runaway (plasma physics)
    - mechanical shock
    - ∞ motion
      - shock resistance
- high alt target and background measurement**
- UF *HITAB program*
  - RT ∞ measurement
    - target acquisition
- high altitude**
- UF *high altitude flight*
  - GS altitude
    - . **high altitude**
  - RT midaltitude
    - skyhook balloons
    - upper atmosphere
- high altitude balloons**
- GS expandable structures
    - . inflatable structures
    - . . balloons
    - . . . **high altitude balloons**
    - . . . . jimsphere balloons
    - . . . . skyhook balloons
    - . . . . superpressure balloons
  - RT balloon-borne instruments
    - gas bags
    - meteorological balloons
    - ROBIN balloons

## high altitude breathing

rockoons

**high altitude breathing**  
GS respiration  
  . **high altitude breathing**  
RT altitude tolerance  
∞ breathing  
  emergency life sustaining systems  
  hypobaric atmospheres  
  oxygen masks

**high altitude environments**  
GS environments  
  . **high altitude environments**  
RT altitude simulation  
  altitude tests  
  altitude tolerance  
  escape capsules  
  hypobaric atmospheres  
  low pressure  
  low temperature environments  
  mountain inhabitants  
  thermal vacuum tests  
  timberline  
  vacuum chambers

*high altitude flight*  
USE **flight**  
  **high altitude**

**high altitude nuclear detection**  
GS detection  
  . **high altitude nuclear detection**  
RT space surveillance (spaceborne)  
  Vela satellites

**high altitude pressure**  
GS pressure  
  . low pressure  
  . . **high altitude pressure**  
RT altitude tolerance  
  atmospheric pressure  
  hypobaric atmospheres  
  vacuum chambers

*high altitude sounding projectile*  
USE **WASP sounding rocket**

**high altitude tests**  
GS altitude tests  
  . **high altitude tests**  
RT background radiation  
  environmental tests  
  Fishbowl Operation  
  flight tests  
  full scale tests  
  test vehicles  
∞ tests  
  Vela satellites

**high aspect ratio**  
GS ratios  
  . aspect ratio  
  . . **high aspect ratio**

*high aspect ratio wings*  
USE **slender wings**

**high current**  
GS electric current  
  . **high current**  
RT high voltages  
  plasma currents

**high definition television**  
(added August 1990)  
UF *HDTV*  
GS television systems  
  . **high definition television**  
RT communication equipment  
  digital television  
  high resolution  
  image resolution  
  imaging techniques  
  television transmission  
  video communication  
  video data

**high dispersion spectrographs**  
GS measuring instruments  
  . optical measuring instruments

  . . photometers  
  . . . ultraviolet spectrometers  
  . . . . **high dispersion spectrographs**  
  . radiation measuring instruments  
  . . actinometers  
  . . . ultraviolet detectors  
  . . . . ultraviolet spectrometers  
  . . . . . **high dispersion spectrographs**  
  . . photometers  
  . . . ultraviolet spectrometers  
  . . . . **high dispersion spectrographs**  
  . spectrometers  
  . . ultraviolet spectrometers  
  . . . **high dispersion spectrographs**  
  optical equipment  
  . optical measuring instruments  
  . . photometers  
  . . . ultraviolet spectrometers  
  . . . . **high dispersion spectrographs**  
  spectrographs  
  . **high dispersion spectrographs**  
RT ultraviolet spectra

*High Eccentric Lunar Occultation Satellite*  
USE **Exosat satellite**

## high electron mobility transistors

(added November 1992)  
DEF A recently developed field effect transistor based on the technique of modulation doping of GaAs/Al(x)Ga(1-x) as heterojunctions. This technique achieves high mobility in part by introducing carriers into high purity GaAs from donor ions in an adjacent AlGaAs layer, the electrons and ions being separated by the built-in heterojunction potential. Used for HEMT (electronics)

UF *HEMT (electronics)*  
GS electronic equipment  
  . solid state devices  
  . . semiconductor devices  
  . . . heterojunction devices  
  . . . . **high electron mobility transistors**  
  . . . . . MODFETS  
  . . . transistors  
  . . . . **high electron mobility transistors**  
  . . . . . MODFETS  
RT cascode devices  
  electron mobility  
  field effect transistors  
  indium aluminum arsenides  
  modulation doping

*High Energy Astronomy Observatories*  
USE **HEAO**

*High Energy Astronomy Observatory 1*  
USE **HEAO 1**

*High Energy Astronomy Observatory 2*  
USE **HEAO 2**

*High Energy Astronomy Observatory 3*  
USE **HEAO 3**

*High Energy Astronomy Observatory 4*  
(added May 1997)  
USE **HEAO 4**

*High Energy Astronomy Observatory A*  
USE **HEAO 1**

*High Energy Astronomy Observatory B*  
USE **HEAO 2**

*High Energy Astronomy Observatory C*  
USE **HEAO 3**

*High Energy Astronomy Observatory D*  
(added May 1997)  
USE **HEAO 4**

## high energy electrons

GS particles  
  . charged particles

  . . energetic particles  
  . . . electrons  
  . . . . **high energy electrons**  
  . . . . . relativistic electron beams  
  . corpuscular radiation  
  . . energetic particles  
  . . . electrons  
  . . . . **high energy electrons**  
  . . . . . relativistic electron beams  
  . elementary particles  
  . . fermions  
  . . . leptons  
  . . . . electrons  
  . . . . . **high energy electrons**  
  . . . . . . relativistic electron beams  
RT SCATHA satellite

## high energy fuels

SN (HEAT CONTENT GREATER THAN OR EQUAL TO APPROXIMATELY 25,000 BTU/LB)  
UF *HEF (high energy fuels)*  
GS fuels  
  . chemical fuels  
  . . **high energy fuels**  
RT additives  
  boron compounds  
  catalysts  
  cryogenic rocket propellants  
  hybrid propellants  
  hydrocarbon fuels

## high energy interactions

GS particle interactions  
  . elementary particle interactions  
  . . **high energy interactions**  
  . . . strong interactions (field theory)  
RT annihilation reactions  
  beam interactions  
  fission products  
∞ interactions  
  nuclear explosions  
  nuclear fission  
  nuclear fusion  
  nuclear interactions  
  nuclear radiation  
  nuclear reactions  
  nuclear research  
  pair production  
  particle production  
  Pomeranchuk theorem  
  proton-antiproton interactions  
  thermonuclear reactions  
  vector dominance model

## high energy oxidizers

GS oxidizers  
  . **high energy oxidizers**  
RT rocket oxidizers

## high energy propellants

GS propellants  
  . **high energy propellants**  
  . . Domino propellants  
RT cryogenic rocket propellants  
  gaseous rocket propellants  
  hybrid propellants  
  liquid rocket propellants

## high field magnets

UF *supermagnets*  
GS magnets  
  . electromagnets  
  . . **high field magnets**  
RT superconducting magnets

## high flux beam reactors

RT nuclear reactors

## high flux isotope reactors

UF *HFIR*  
  *HFIR (reactor)*  
GS nuclear reactors  
  . **high flux isotope reactors**  
RT neutron flux density

## high frequencies

SN (3 - 30 MHZ)  
GS frequencies  
  . radio frequencies  
  . . **high frequencies**

RT decametric waves  
intermediate frequencies  
low frequencies  
maximum usable frequency  
ring discharge  
short wave radiation  
short wave radio transmission  
toroidal discharge

**high gain**  
GS amplification  
. **high gain**  
RT antenna gain  
pilot induced oscillation  
power gain  
transfer functions

*high gravity (acceleration)*  
USE **high gravity environments**

**high gravity environments**  
UF *high gravity (acceleration)*  
*hypergravity*  
GS environments  
. **high gravity environments**  
rates (per time)  
. acceleration (physics)  
. . . **high gravity environments**  
RT ∞ acceleration  
centrifuges  
extraterrestrial environments  
gravitation  
human centrifuges  
microgravity  
rotating environments

**high impulse**  
GS impulses  
. **high impulse**  
RT ∞ force  
propulsion

*high intensity lasers*  
USE **high power lasers**

*high latitudes*  
USE **polar regions**

**high level languages**  
DEF Computer languages whose instructions or statements each correspond to several machine language instructions.  
UF *higher order languages*  
GS languages  
. programming languages  
. . . **high level languages**  
. . . Ada (programming language)  
. . . C (programming language)  
. . . C++ (programming language)  
. . . Java (programming language)  
RT communication theory  
language programming  
symbols

*high melting compounds*  
USE **refractory materials**

**high pass filters**  
DEF Wave filters having a single transmission band extending from some critical or cutoff frequency, not zero, up to infinite frequency.  
RT bandstop filters  
electric filters  
electromagnetic wave filters  
∞ filters  
microwave filters  
optical filters

**high polymers**  
RT ∞ polymers

**high power lasers**  
DEF Stimulated emission devices having high energy flux density outputs. Used for high intensity lasers.  
UF *high intensity lasers*  
GS stimulated emission devices  
. lasers  
. . . **high power lasers**  
. . . Nova Laser System  
. . . Shiva laser system

RT free-space optical communication  
glass lasers  
laser fusion  
laser outputs  
optical communication

**high pressure**  
GS pressure  
. **high pressure**  
RT anticyclones  
critical pressure  
degenerate matter  
hyperbaric chambers  
low pressure  
supercritical pressures  
transition pressure  
vacuum

**high pressure oxygen**  
GS gases  
. compressed gas  
. . . **high pressure oxygen**  
RT fire prevention  
oxygen  
pressure  
spacecraft cabin atmospheres

*high Q*  
USE **Q factors**

∞ **high resistance**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT chemical properties  
electrical resistance  
flow resistance  
mechanical properties  
∞ physical properties  
∞ resistance  
ruggedness  
thermal resistance

**high resolution**  
GS resolution  
. **high resolution**  
RT accuracy  
angular resolution  
high definition television  
precision  
spatial resolution

**high resolution coverage antennas**  
UF *HICAT (radar technique)*  
*HICAT project*  
GS antennas  
. **high resolution coverage antennas**  
RT radar antennas  
radar resolution  
resolution

**high Reynolds number**  
SN (RN ABOVE 3,000)  
DEF A Reynolds number above the critical Reynolds number of a sphere.  
GS dimensionless numbers  
. Reynolds number  
. . . **high Reynolds number**  
ratios  
. Reynolds number  
. . . **high Reynolds number**  
RT low Reynolds number

**high speed**  
UF *high speed flight*  
GS rates (per time)  
. **high speed**  
velocity  
. **high speed**  
RT airspeed  
escape velocity  
ground speed  
hypersonic speed  
landing speed  
light speed  
relativistic velocity  
rotor speed

supersonic speed

**high speed cameras**  
GS optical equipment  
. cameras  
. . . **high speed cameras**  
. . . framing cameras  
photographic equipment  
. cameras  
. . . **high speed cameras**  
. . . framing cameras  
RT ballistic cameras  
frame photography  
high speed photography  
rotating mirrors  
streak photography  
stroboscopes

*high speed flight*  
USE **flight**  
**high speed**

**high speed photography**  
GS imagery  
. photography  
. . . **high speed photography**  
RT high speed cameras  
photographic recording

*high speed transportation*  
USE **rapid transit systems**

**high strength**  
GS mechanical properties  
. **high strength**  
RT compressive strength  
shear strength  
∞ strength  
tensile strength  
tensile stress  
yield strength

**high strength alloys**  
GS alloys  
. **high strength alloys**  
. . . Astroloy (trademark)  
. . . high strength steels  
. . . maraging steels  
RT aluminum-lithium alloys  
tensile properties

**high strength steels**  
UF *low alloy steels*  
GS alloys  
. high strength alloys  
. . . **high strength steels**  
. . . maraging steels  
. iron alloys  
. steels  
. . . **high strength steels**  
. . . maraging steels  
RT carbon steels

**high temperature**  
GS temperature  
. **high temperature**  
RT sialon  
temperature measurement

**high temperature air**  
UF *hot air*  
GS gases  
. gas mixtures  
. air  
. . . **high temperature air**  
. high temperature gases  
. . . **high temperature air**  
high temperature fluids  
. high temperature gases  
. . . **high temperature air**  
mixtures  
. solutions  
. gas mixtures  
. air  
. . . **high temperature air**

*high temperature alloys*  
USE **heat resistant alloys**

**high temperature environments**  
GS environments

## high temperature fluids

. **high temperature environments**  
RT dry heat  
heat acclimatization  
lunar temperature  
thermal environments  
thermal fatigue

*high temperature fatigue*  
USE **thermal fatigue**

**high temperature fluids**  
GS **high temperature fluids**  
. high temperature gases  
. . high temperature air

RT ∞ fluids  
hydraulic fluids  
plasmas (physics)  
working fluids

**high temperature gas cooled reactors**

UF *HTGR*  
GS nuclear reactors  
. gas cooled reactors  
. . high temperature nuclear reactors  
. . . **high temperature gas cooled reactors**  
. nuclear research and test reactors  
. . high temperature nuclear reactors  
. . . **high temperature gas cooled reactors**  
RT nuclear power reactors

**high temperature gases**

UF *hot gas systems*  
*hot gases*  
*hot jet exhaust*  
GS gases  
. **high temperature gases**  
. . high temperature air  
high temperature fluids  
. **high temperature gases**  
. . high temperature air  
RT combustion products  
exhaust emission  
ionized gases  
pneumatic probes  
rarefied gases  
shock wave propagation

**high temperature lubricants**

GS lubricants  
. **high temperature lubricants**  
RT gas bearings  
gas lubricants  
thermal resistance

*high temperature materials*  
USE **refractory materials**

**high temperature nuclear reactors**

UF *Los Alamos Turret Reactor*  
*UHTREX (nuclear reactors)*  
GS nuclear reactors  
. gas cooled reactors  
. . **high temperature nuclear reactors**  
. . . high temperature gas cooled reactors  
. nuclear research and test reactors  
. . **high temperature nuclear reactors**  
. . . high temperature gas cooled reactors  
RT nuclear propulsion  
reactor design  
reactor technology  
∞ reactors

**high temperature plasmas**

UF *hot plasmas*  
GS particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)  
. . . . **high temperature plasmas**  
. corpuscular radiation  
. . energetic particles  
. . . plasmas (physics)  
. . . . **high temperature plasmas**  
RT Boltzmann-Vlasov equation

collisional plasmas  
dense plasmas  
electron plasma  
Helios Project  
relativistic plasmas  
strongly coupled plasmas  
thermal plasmas

**high temperature propellants**

GS propellants  
. **high temperature propellants**  
RT electrothermal engines  
gelled propellants  
gelled rocket propellants  
ion propulsion  
nuclear propulsion  
plasma engines  
solid propellants  
storable propellants

**high temperature research**

GS research  
. **high temperature research**  
RT plasma generators  
refractory materials

**high temperature superconductors**

(added December 1992)  
DEF New superconducting materials consisting of mixed metal oxide ceramics that maintain their superconductivity at higher temperature ranges (above 24 K) than the more traditional superconductors.  
UF *HTSC (superconductors)*  
GS conductors  
. superconductors (materials)  
. . **high temperature superconductors**  
. . . BSCCO superconductors  
. . . YBCO superconductors  
RT barium oxides  
ceramics  
critical temperature  
cryogenic gyroscopes  
cryogenic magnets  
cryogenics  
electrical resistivity  
Josephson junctions  
liquid nitrogen  
low temperature physics  
metal oxides  
mixed oxides  
operating temperature  
SIS (superconductors)  
strontium oxides  
superconducting magnets  
superconducting power transmission  
superconductivity  
yttrium oxides

**high temperature tests**

UF *heat tests*  
GS environmental tests  
. **high temperature tests**  
RT bomb calorimeters  
calorimeters  
chemical tests  
cold strength  
cold weather tests  
cryostats  
drop calorimeters  
flame calorimeters  
hardness tests  
lubricant tests  
∞ materials tests  
melting points  
nondestructive tests  
temperature control  
∞ tests  
thermal expansion  
thermal resistance  
thermal shock  
thermal stability  
thermodynamic properties  
transport properties

**high thrust**

GS thrust  
. **high thrust**  
RT jet thrust

low thrust  
rocket thrust  
thrust augmentation  
variable thrust

**high vacuum**

GS pressure  
. vacuum  
. . **high vacuum**  
RT cold welding  
low vacuum  
molecular shields  
residual gas  
space manufacturing  
ultrahigh vacuum  
vacuum apparatus  
vacuum tests

**High Vacuum Orbital Simulator**

UF *HIVOS (simulator)*  
GS simulators  
. environment simulators  
. . space simulators  
. . . **High Vacuum Orbital Simulator**  
RT space environment simulation

*high velocity oxy-fuel spraying*  
(added July 2001)

USE **HVOF thermal spraying**

*high velocity oxygen fuel thermal spraying*  
(added July 2001)

USE **HVOF thermal spraying**

**high voltages**

GS potential energy  
. electric potential  
. . **high voltages**  
RT electric current  
high current

*higher order languages*

USE **high level languages**

**highlands**

DEF A general term for large areas of elevated or mountainous land standing prominently above adjacent low areas; mountainous regions.  
RT Colorado Plateau (US)  
mesas  
mountains  
plateaus  
topography

*Highly Eccentric Orbit satellites*

USE **HEOS satellites**

**highly maneuverable aircraft**

UF *HIMAT*  
RT airborne/spaceborne computers  
∞ aircraft  
aircraft maneuvers  
automatic flight control  
automatic pilots  
computerized simulation  
fighter aircraft  
flight characteristics  
flight tests  
remotely piloted vehicles

**highways**

GS roads  
. **highways**  
RT air bag restraint devices  
bridges (structures)  
construction  
crashes  
intersections  
pavements  
ramps (structures)  
rapid transit systems  
regional planning  
streets  
transportation  
transportation networks

- urban planning
- H-II orbiting plane*  
USE **HOPE aerospace plane**
- hijacking*  
USE **air piracy**
- Hilbert space**  
GS algebra  
. vector spaces  
.. Banach space  
... **Hilbert space**  
.... Sobolev space  
analysis (mathematics)  
. function space  
.. Banach space  
... **Hilbert space**  
.... Sobolev space  
. functional analysis  
.. Banach space  
... **Hilbert space**  
.... Sobolev space  
geometry  
. topology  
.. metric space  
... **Hilbert space**  
.... Sobolev space
- Hilbert transformation**  
GS analysis (mathematics)  
. functional analysis  
.. integral transformations  
... **Hilbert transformation**  
transformations (mathematics)  
. integral transformations  
.. **Hilbert transformation**
- Hill curves*  
USE **Hill method**
- Hill determinant**  
GS analysis (mathematics)  
. **Hill determinant**  
RT differential equations  
eigenvalues  
Mathieu function
- Hill lunar theory**  
RT Earth orbits  
orbital mechanics  
perturbation theory  
∞ theories
- Hill method**  
UF *Hill curves*  
RT Earth orbits  
∞ methodology  
orbital mechanics  
perturbation theory
- Hiller aircraft**  
GS **Hiller aircraft**  
. OH-5 helicopter  
RT ∞ aircraft
- Hilsch tubes**  
UF *vortex tubes*  
RT coaxial flow  
cooling  
heating  
∞ tubes  
vortex generators  
vortices
- Himalayas**  
GS landforms  
. mountains  
.. **Himalayas**  
RT Asia  
Bhutan  
India  
Pakistan  
Sikkim  
Tibet
- Himalia**  
(added July 1995)  
DEF A natural satellite of Jupiter, orbiting at a mean distance of 11,480,000 kilometers.  
GS celestial bodies
- . natural satellites  
.. Jupiter satellites  
... **Himalia**  
RT Jupiter (planet)
- HIMAT**  
USE **highly maneuverable aircraft**
- hindcasting**  
(added July 1999)  
DEF The process of reconstructing the time and space evolution of an atmospheric or oceanic phenomenon that has occurred in the past, through an analysis of historical data, a mathematical-model simulation of the processes involved, or a combination of data analysis and modeling.  
GS predictions  
. **hindcasting**  
RT forecasting  
meteorological parameters  
nowcasting  
oceanographic parameters  
weather forecasting
- hindlimb suspension**  
(added June 2001)  
DEF Technique for limiting use, activity, or movement by immobilizing or restraining animal by suspending from hindlimbs or tails. This immobilization is used to simulate some effects of reduced gravity and study weightlessness physiology.  
UF *hindlimb unloading*  
GS immobilization  
. **hindlimb suspension**  
suspending (hanging)  
. **hindlimb suspension**  
RT aerospace medicine  
atrophy  
bioastronautics  
bone demineralization  
gravitational physiology  
head down tilt  
head up tilt  
hypodynamia  
hypokinesia  
limbs (anatomy)  
tilt-table test  
weightlessness simulation
- hindlimb unloading*  
(added June 2001)  
USE **hindlimb suspension**
- hindrance*  
USE **constraints**
- H-infinity control**  
(added November 1992)  
GS automatic control  
. optimal control  
.. **H-infinity control**  
optimization  
. optimal control  
.. **H-infinity control**  
RT control systems design  
control theory  
controllers  
feedback control  
H-2 control  
linear parameter-varying control  
linear quadratic Gaussian control
- hinge moments*  
USE **torque**
- hinged rotor blades*  
USE **hinges**  
**rotary wings**
- hingeless rotors*  
USE **rigid rotors**
- hinges**  
UF *hinged rotor blades*  
GS **hinges**  
. flapping hinges  
RT bearingless rotors  
pivots
- swivels
- HIP (process)*  
USE **hot isostatic pressing**
- Hipparcos satellite**  
DEF An ESA astrometric satellite to determine trigonometric parallaxes, proper motions, and positions of 100,000 stars, mainly for stars brighter than magnitude 10. The satellite was launched in August 1989.  
GS artificial satellites  
. ESA satellites  
.. **Hipparcos satellite**  
ESA spacecraft  
. ESA satellites  
.. **Hipparcos satellite**  
RT astrometry  
European space programs  
spaceborne astronomy  
stellar motions  
stellar parallax
- hippocampus**  
GS anatomy  
. nervous system  
.. central nervous system  
... brain  
.... **hippocampus**
- hippuric acid**  
GS acids  
. amino acids  
.. **hippuric acid**  
organic compounds  
. amino acids  
.. **hippuric acid**
- His bundle**  
RT cardiac auricles  
cardiac ventricles  
electrophysiology  
heart diseases  
heart function  
nerves
- hiss**  
DEF Random noise in the audiofrequency range, having subjective characteristics analogous to prolonged sibilant sounds.  
GS electromagnetic interference  
. radio frequency interference  
.. electromagnetic noise  
... atmospheric  
.... ionospheric  
..... **hiss**
- histamines**  
GS drugs  
. **histamines**  
RT amines  
antihistaminics  
itching
- histidine**  
GS acids  
. amino acids  
.. **histidine**  
organic compounds  
. amines  
.. **histidine**  
. amino acids  
.. **histidine**
- histochemical analysis**  
DEF In biochemistry, the analysis of chemical components in tissues.  
RT bioassay  
biochemistry  
cells (biology)  
organic chemistry  
tissues (biology)
- histograms**  
RT discrete functions  
graphs (charts)  
normal density functions
- histology**  
GS medical science  
. **histology**

## histories

RT epithelium  
in vitro methods and tests  
in vivo methods and tests  
morphology  
platelets  
tissue engineering  
tissues (biology)

**histories**  
GS **histories**  
. case histories  
RT documentation  
museums  
paleontology  
peacetime  
records

*HITAB program*  
USE **high alt target and background measurement**

*HIV (virus)*  
USE **human immunodeficiency virus**

*HIVOS (simulator)*  
USE **High Vacuum Orbital Simulator**

**HL-10 reentry vehicle**  
GS gliders  
. **HL-10 reentry vehicle**  
lifting bodies  
. lifting reentry vehicles  
. . **HL-10 reentry vehicle**  
reentry vehicles  
. maneuverable reentry bodies  
. . lifting reentry vehicles  
. . . **HL-10 reentry vehicle**  
RT hypersonic gliders

**HLD-35 reentry vehicle**  
GS lifting bodies  
. lifting reentry vehicles  
. . **HLD-35 reentry vehicle**  
reentry vehicles  
. maneuverable reentry bodies  
. . lifting reentry vehicles  
. . . **HLD-35 reentry vehicle**  
RT hypersonic gliders

*HLLV*  
USE **heavy lift launch vehicles**

*HMD (displays)*  
USE **helmet mounted displays**

**HMX**  
UF *cyclotetramethylene tetranitramine*  
*tetranitrotetraazacyclooctane*  
GS explosives  
. **HMX**  
nitrogen compounds  
. azo compounds  
. . **HMX**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **HMX**  
propellants  
. rocket propellants  
. . solid rocket propellants  
. . . **HMX**  
solid propellants  
. solid rocket propellants  
. . . **HMX**  
pyrotechnics  
. **HMX**

*HNPF (Hallam Nuclear Power Facility)*  
USE **Hallam Nuclear Power Facility**

*HNST*  
USE **hexanitrostilbene**

*HO-4 helicopter*  
USE **OH-4 helicopter**

*HO-5 helicopter*  
USE **OH-5 helicopter**

*HO-6 helicopter*  
USE **OH-6 helicopter**

**holographs**  
RT Chaplygin equation

kinematics  
vector spaces

**hodoscopes**  
GS measuring instruments  
. radiation measuring instruments  
. . **hodoscopes**  
RT anticoincidence detectors  
radiation counters  
scintillating fibers

*hogbacks*  
USE **ridges**

**hohlraums**  
DEF In radiation thermodynamics, cavities whose walls are in radiative equilibrium with the radiant energy with the cavity.  
RT black body radiation  
emissivity

*Hohmann trajectories*  
USE **elliptical orbits**  
**transfer orbits**

*Hohmann transfer orbits*  
USE **elliptical orbits**  
**transfer orbits**

**holders**  
GS **holders**  
. flame holders  
RT anchors (fasteners)  
∞ bands  
bolts  
brackets  
clamps  
clips  
fasteners  
jigs  
latches  
lugs  
mechanical devices  
nuts (fasteners)  
pins  
positioning devices (machinery)  
rivets  
screws  
∞ spikes  
splines  
straps  
studs (structural members)  
zippers

∞ **holding**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT constraints  
delay  
retaining  
stopping

**hole burning**  
DEF A laser process that depletes, spatially or spectrally, the electron/hole pair density in a region of space or frequency of high coherent light, being spatial hole burning and spectral hole burning respectively.  
RT computer storage devices  
holography  
laser applications  
lasers  
lasing  
memory (computers)

∞ **hole distribution**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT current distribution  
hole distribution (electronics)  
hole distribution (mechanics)

**hole distribution (electronics)**  
GS distribution (property)  
. **hole distribution (electronics)**  
RT charge distribution  
current distribution  
∞ hole distribution  
holes (electron deficiencies)

semiconductors (materials)

**hole distribution (mechanics)**  
GS distribution (property)  
. **hole distribution (mechanics)**  
RT cavities  
∞ hole distribution  
holes (mechanics)  
perforated shells  
porosity  
stress concentration  
void ratio

**hole geometry (mechanics)**  
DEF The sizes, locations, and shapes of perforations created in materials.  
RT fracture mechanics  
holes (mechanics)  
perforated plates  
perforated shells  
stress concentration  
stress intensity factors  
structural analysis

**hole mobility**  
GS electrical properties  
. carrier mobility  
. . **hole mobility**  
mobility  
. carrier mobility  
. . **hole mobility**  
transport properties  
. carrier mobility  
. . **hole mobility**  
RT atomic mobilities  
charge carriers  
electromigration  
electron mobility  
holes (electron deficiencies)  
∞ solid state physics

∞ **holes**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT boreholes  
cavities  
coronal holes  
gaps  
holes (electron deficiencies)  
holes (mechanics)

**holes (electron deficiencies)**  
(added November 1991)  
UF *electron holes*  
GS charge carriers  
. **holes (electron deficiencies)**  
RT acceptor materials  
crystal defects  
donor materials  
electrons  
excitons  
hole distribution (electronics)  
hole mobility  
∞ holes  
majority carriers  
∞ materials  
minority carriers  
order-disorder transformations  
p-type semiconductors  
resonant tunneling diodes  
semiconductor plasmas  
semiconductors (materials)  
Suhl effect  
vacancies (crystal defects)

**holes (mechanics)**  
(added September 1988)  
RT cavities  
hole distribution (mechanics)  
hole geometry (mechanics)  
∞ holes  
perforated plates  
perforated shells  
∞ perforation

porous boundary layer control

Holland

USE **Netherlands**

∞ **hollow**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Low tract of land surrounded by hills or mountains; small sheltered valley or basin, especially in a rugged area.

RT cavities  
∞ depression  
recesses

**hollow cathodes**

GS electrodes  
. cathodes  
. . **hollow cathodes**  
RT tube cathodes  
tunnel cathodes

**holmium**

GS chemical elements  
. rare earth elements  
. . **holmium**  
. . . holmium isotopes  
metals  
. rare earth elements  
. . **holmium**  
. . . holmium isotopes

**holmium isotopes**

GS chemical elements  
. nuclides  
. . isotopes  
. . . **holmium isotopes**  
. rare earth elements  
. . holmium  
. . . **holmium isotopes**  
metals  
. rare earth elements  
. . holmium  
. . . **holmium isotopes**

**Holocene epoch**

(added May 2001)

DEF Most recent geologic epoch of the Quaternary period extending from about 10,000 years ago to, and including, the present.

GS Cenozoic Era  
. Quaternary period  
. . **Holocene epoch**

RT geochronology  
Pleistocene epoch

**hologrammetry**

RT holography  
imaging techniques  
photographic recording  
photomapping  
speckle holography  
terrain analysis

**holographic interferometry**

GS interferometry  
. **holographic interferometry**  
RT coherent light  
diffraction patterns  
holographic optical elements  
holography  
laser outputs  
Moire interferometry  
scatter plates (optics)  
speckle holography  
wave front reconstruction

**holographic optical elements**

(added April 1995)

DEF Holograms used to control transmitted light beams, rather than to display images, based on the principles of diffraction.

RT diffraction paths  
geometrical optics  
holographic interferometry  
imagery  
laser beams  
light transmission  
optical paths  
pulse diffraction

wave diffraction  
white light holography

**holographic spectroscopy**

GS spectroscopy  
. **holographic spectroscopy**  
RT Fourier transformation  
holography  
spectrum analysis  
wave front reconstruction

**holographic subtraction**

DEF A holographic technique by which two dissimilar optical fields can be subtracted to yield only their difference. Used for self subtraction holography.

UF *self subtraction holography*  
RT holography

**holography**

DEF The interferometry technique used to make three-dimensional pictures of surfaces. One light beam illuminates a surface, and sets up interference patterns with a reference beam.

GS imagery  
. photography  
. . **holography**  
. . . acoustical holography  
. . . microwave holography  
. . . speckle holography  
. . . white light holography  
RT coherent electromagnetic radiation  
coherent light  
data storage  
differential interferometry  
diffractive optics  
Gabor transformation  
hole burning  
hologrammetry  
holographic interferometry  
holographic spectroscopy  
holographic subtraction  
image correlators  
image reconstruction  
kinoform  
lasers  
optical memory (data storage)  
photopolymers  
scatter plates (optics)  
spatial filtering  
speckle patterns  
wave front reconstruction

*holomorphism*

USE **analytic functions**

**homeostasis**

RT acclimatization  
acid base equilibrium  
adaptation  
body temperature  
cold tolerance  
colloids  
∞ equilibrium  
fibrinogen  
hormones  
metabolism  
nervous system  
osmosis  
physiology  
respiratory system  
skin (anatomy)  
stress (physiology)  
thermoregulation  
thromboplastin  
water balance

**homeotherms**

UF *warm blooded animals*  
GS animals  
. **homeotherms**  
RT birds  
body temperature  
mammals  
vertebrates

**homing**

DEF The following of a path of energy waves to or toward their source or point of reflection.

RT automatic pilots  
beacons  
guidance (motion)  
missile control  
proportional navigation  
radio direction finders  
terminal guidance

**homing devices**

UF *seekers*  
RT beacons  
guidance (motion)  
infrared tracking  
laser guidance  
missiles  
navigation  
navigation aids  
radio beacons  
radio direction finders  
radio navigation  
rendezvous guidance  
solar compasses  
trajectory control

**homodyne reception**

GS signal reception  
. **homodyne reception**  
RT frequency synchronization  
radio reception

**homogeneity**

DEF Having the same properties at all points.  
RT anisotropic media  
homogenizing  
sampling  
statistical tests  
unity  
variance (statistics)

**homogeneous turbulence**

GS turbulence  
. **homogeneous turbulence**  
RT atmospheric turbulence  
fluctuation theory  
isotropic turbulence  
low level turbulence  
magneto-hydrodynamic turbulence

*homogenization*

USE **homogenizing**

**homogenizing**

UF *homogenization*  
GS mixing  
. **homogenizing**  
RT agitation  
colloiding  
compounding  
dispersing  
dissolving  
homogeneity  
premixing  
∞ separation  
suspending (mixing)

**homojunctions**

DEF Junctions between semiconductors that differ in their doping level conductivities but not in their atomic or alloy composition.

GS semiconductor junctions  
. **homojunctions**  
RT heterojunction devices  
heterojunctions  
silicon junctions  
solar cells

**homology**

UF *cohomology*  
RT analogies  
duality theorem  
matching  
∞ relationships  
topology

**homomorphisms**

GS algebra  
. group theory  
. . **homomorphisms**  
. . . automorphisms



## homopolar generators

. . . monoids  
. . . subgroups  
RT field theory (algebra)  
isomorphism

### homopolar generators

DEF Rotating electric machines for converting mechanical power into pure direct current by utilizing poles having the same polarity at the armature.

GS electric generators  
. direct power generators  
. . DC generators  
. . . **homopolar generators**  
. rotating generators  
. . **homopolar generators**  
RT direct current  
∞ electric equipment  
electromechanical devices  
∞ generators

### homosphere

DEF The lower portion of a two part division of the atmosphere according to the general homogeneity of atmospheric composition; opposed to the heterosphere. The region in which there is no gross change in atmospheric composition, that is, all the atmosphere from the Earth's surface to about 90 kilometers. The homosphere is about equivalent to the neutrosphere, and includes the troposphere, stratosphere, and mesosphere; it also includes the ozonosphere and at least part of the chemosphere.

GS Earth atmosphere  
. **homosphere**  
RT biosphere  
chemosphere  
Earth ionosphere  
lower atmosphere  
mesosphere  
middle atmosphere  
ozonosphere  
stratosphere  
thermosphere  
troposphere  
upper atmosphere

### homotopy theory

GS geometry  
. topology  
. . **homotopy theory**  
RT curves (geometry)  
fibers (mathematics)  
∞ theories

### homotropy

RT algebra  
problem solving  
set theory  
topology

### Honduras

GS nations  
. **Honduras**  
RT Central America

### Honest John rocket vehicle

GS rocket vehicles  
. single stage rocket vehicles  
. . **Honest John rocket vehicle**  
. surface to surface rockets  
. . **Honest John rocket vehicle**  
RT Argo rocket vehicles  
EXOS sounding rocket  
Hercules engine  
solid propellant rocket engines  
Trailblazer 1 reentry vehicle

### honeycomb cores

DEF Lightweight strengthening materials of structures resembling honeycomb meshes.

GS cores  
. **honeycomb cores**  
honeycomb structures  
. **honeycomb cores**  
RT ceramic honeycombs  
composite structures  
low density materials

sandwich structures

### honeycomb mirrors

(added August 1995)

DEF High strength to weight telescope mirrors constructed of spun-cast borosilicate glass in a honeycomb structure that optically represents a single large mirror.

GS honeycomb structures  
. **honeycomb mirrors**  
mirrors  
. **honeycomb mirrors**  
RT adaptive optics  
astronomical observatories  
borosilicate glass  
optical correction procedure  
reflecting telescopes  
segmented mirrors

### honeycomb structures

GS **honeycomb structures**  
. honeycomb cores  
. honeycomb mirrors  
RT ∞ cells  
ceramic honeycombs  
composite structures  
hexagonal cells  
insulation  
laminates  
low density materials  
metal foils  
porous materials  
sandwich structures  
∞ structures

### Honeywell 600/6000 computer

GS data processing equipment  
. computers  
. . analog computers  
. . . **Honeywell 600/6000 computer**  
. . digital computers  
. . . Honeywell computers  
. . . . **Honeywell 600/6000 computer**

### Honeywell ADEPT computer

GS data processing equipment  
. computers  
. . digital computers  
. . . Honeywell computers  
. . . . **Honeywell ADEPT computer**

### Honeywell computers

GS data processing equipment  
. computers  
. . digital computers  
. . . **Honeywell computers**  
. . . . DDP 516 computer  
. . . . Honeywell 600/6000 computer  
. . . . Honeywell ADEPT computer  
. . . . Honeywell DDP 116 computer

### Honeywell DDP 116 computer

GS data processing equipment  
. computers  
. . digital computers  
. . . Honeywell computers  
. . . . **Honeywell DDP 116 computer**

### Hong Kong

RT Asia  
China  
nations  
Taiwan

### honoring

RT scrapers  
smoothing

### Hookes law

GS laws  
. **Hookes law**  
RT elastic properties  
fiber strength  
Maxwell bodies  
modulus of elasticity  
shear properties  
stress-strain diagrams

### hooks

RT fasteners

forks  
swivels

### hoop column antennas

GS antennas  
. **hoop column antennas**  
RT large space structures  
satellite communication  
spacecraft communication

### hoops

RT ring structures  
tensile stress

### Hopcalite (trademark)

GS catalysts  
. **Hopcalite (trademark)**  
chalcogenides  
. oxides  
. . metal oxides  
. . . manganese oxides  
. . . . **Hopcalite (trademark)**  
manganese compounds  
. manganese oxides  
. . **Hopcalite (trademark)**  
RT air purification  
carbon monoxide  
gas analysis

### HOPE aerospace plane

(added September 1995)

UF *H-2 orbiting plane*  
*H-11 orbiting plane*  
GS aerospace vehicles  
. aerospace planes  
. . **HOPE aerospace plane**  
maneuverable spacecraft  
. aerospace planes  
. . **HOPE aerospace plane**  
manned spacecraft  
. **HOPE aerospace plane**  
reentry vehicles  
. recoverable spacecraft  
. reusable spacecraft  
. . aerospace planes  
. . . **HOPE aerospace plane**  
soft landing spacecraft  
. aerospace planes  
. . **HOPE aerospace plane**  
RT hypersonic vehicles  
Japanese space program  
lifting reentry vehicles  
space transportation

### hoppers

RT ∞ containers  
materials handling  
packaging

### horizon

DEF That great circle or the celestial sphere midway between the zenith and nadir, or a line resembling or approximating such a circle.

GS **horizon**  
. event horizon  
. gyro horizons  
. radio horizons  
RT celestial sphere  
range (extremes)

### horizon scanners

UF *horizon sensing*  
*infrared horizon scanners*  
GS flight instruments  
. **horizon scanners**  
scanners  
. **horizon scanners**  
RT attitude control  
infrared scanners  
navigation instruments  
optical equipment  
photometers  
radio horizons  
radiometers

- Scanner project
- horizon sensing*  
USE **horizon scanners**
- horizontal branch stars**  
DEF Horizontal strips of stars on the Hertzsprung-Russell diagram of globular clusters to the left of the red giant branch.  
GS celestial bodies  
. stars  
. . **horizontal branch stars**  
RT color-magnitude diagram  
giant stars  
globular clusters  
Hertzsprung-Russell diagram  
Population II stars  
stellar evolution  
stellar luminosity  
stellar spectra  
stellar spectrophotometry
- horizontal distribution**  
(added September 1992)  
GS distribution (property)  
. spatial distribution  
. . **horizontal distribution**  
RT atmospheric circulation  
atmospheric composition  
atmospheric models  
horizontal orientation  
vertical distribution
- horizontal flight**  
RT aerodynamic balance  
aircraft stability  
climbing flight  
cruising flight  
∞ flight  
flight paths  
rocket flight  
soaring  
transition flight  
turning flight
- horizontal orientation**  
DEF The attitude of an object in reference to the plane which is perpendicular to the direction of gravity.  
RT alignment  
attitude (inclination)  
directional stability  
dynamic stability  
horizontal distribution  
∞ orientation  
stabilization  
vertical orientation
- horizontal spacecraft landing**  
GS landing  
. glide landings  
. . **horizontal spacecraft landing**  
. spacecraft landing  
. . **horizontal spacecraft landing**  
RT approach and landing tests (STS)  
crash landing  
planetary landing  
soft landing  
water landing
- horizontal stabilizers*  
USE **stabilizers (fluid dynamics)**
- horizontal tail surfaces**  
UF *tail planes*  
GS airfoils  
. **horizontal tail surfaces**  
assemblies  
. tail assemblies  
. . **horizontal tail surfaces**  
control surfaces  
. **horizontal tail surfaces**  
stabilizers (fluid dynamics)  
. **horizontal tail surfaces**  
tail surfaces  
. **horizontal tail surfaces**  
RT aerial rudders  
elevators (control surfaces)  
∞ surfaces
- trapezoidal tail surfaces
- horizontally polarized shear waves*  
USE **SH waves**
- hormone metabolisms**  
GS metabolism  
. **hormone metabolisms**  
RT glucocorticoids  
hormones
- hormones**  
GS secretions  
. endocrine secretions  
. . **hormones**  
. . . corticosteroids  
. . . . aldosterone  
. . . . hydroxycorticosteroid  
. . . . . cortisone  
. . . . . glucocorticoids  
. . . estrogens  
. . . . . hypertensin  
. . . . . pituitary hormones  
. . . . . adrenocorticotropin (ACTH)  
. . . . . vasopressins  
. . . . . prostaglandins  
. . . . . thyroxine  
RT catecholamine  
endocrine systems  
epinephrine  
homeostasis  
hormone metabolisms  
melatonin  
regulatory mechanisms (biology)  
steroids
- horn antennas**  
DEF Antennas shaped like a horn.  
GS antennas  
. directional antennas  
. . **horn antennas**  
. . . radio antennas  
. . . . microwave antennas  
. . . . . **horn antennas**  
. . . . . waveguide antennas  
. . . . . **horn antennas**  
microwave equipment  
. microwave antennas  
. . **horn antennas**  
radio equipment  
. radio antennas  
. . microwave antennas  
. . . **horn antennas**  
RT antenna design  
lens antennas  
parabolic antennas  
radar antennas  
Schelkunoff principle  
sidelobe reduction  
slot antennas
- horns**  
RT auditory signals  
Schwarzschild antennas  
∞ signals  
sirens  
sound generators  
warning  
warning systems
- horsepower**  
RT physical work  
∞ power  
power efficiency  
work
- horses**  
GS animals  
. vertebrates  
. . mammals  
. . . **horses**  
RT grazing  
livestock
- horseshoe vortices**  
(added July 1989)  
UF *hairpin vortices*  
GS vortices  
. **horseshoe vortices**  
RT Abrikosov theory
- flow distortion  
flow geometry  
vortex filaments  
vortex generators  
vortex rings  
vorticity  
wakes  
wing tip vortices
- hoses**  
RT pipes (tubes)  
∞ tubes
- hospitals**  
RT evacuating (transportation)  
medical equipment
- hot air*  
USE **high temperature air**
- hot atoms**  
DEF Atoms with high internal or kinetic energy as a result of a nuclear process such as beta decay or neutron capture.  
GS atoms  
. **hot atoms**  
RT beta particles  
decay  
neutron decay
- hot cathodes**  
DEF Cathodes that function primarily by the process of thermionic emission.  
GS electrodes  
. cathodes  
. . tube cathodes  
. . . **hot cathodes**  
RT Bayard-Alpert ionization gages  
ionization gages  
thermionic cathodes
- hot corrosion**  
DEF The corrosion at high temperatures as a result of the reduction of protective oxide coatings and scales and the subsequent accelerated oxidation.  
GS corrosion  
. **hot corrosion**  
RT coatings  
damage  
degradation  
deterioration  
erosion  
gas-metal interactions  
metal coatings  
oxidation  
pitting  
rusting  
scale (corrosion)  
surface properties  
temperature dependence
- hot cycle propulsion system*  
USE **tip driven rotors**
- hot electrons**  
GS particles  
. charged particles  
. . energetic particles  
. . . electrons  
. . . . **hot electrons**  
. . . . . corpuscular radiation  
. . . . . energetic particles  
. . . . . electrons  
. . . . . **hot electrons**  
. . . . . elementary particles  
. . . . . fermions  
. . . . . leptons  
. . . . . electrons

## hot isostatic pressing

. . . . . **hot electrons**

*hot extruding*  
USE **extruding**

*hot forming*  
USE **hot working**

*hot gas systems*  
USE **high temperature gases**

*hot gases*  
USE **high temperature gases**

**hot isostatic pressing**  
DEF A thermomechanical process for forming metal-powder compacts or ceramic shapes by use of isostatically applied gas pressure in order to achieve high density in the treated material. Used for HIP (process).  
UF *HIP (process)*  
GS forming techniques  
. pressing (forming)  
. hot pressing  
. . . **hot isostatic pressing**  
hardening (materials)  
. hot pressing  
. . **hot isostatic pressing**  
thermomechanical treatment  
. hot pressing  
. . **hot isostatic pressing**  
RT coining  
cold pressing  
compacting  
forging  
isostatic pressure  
metal working  
∞ pressing  
sintering  
stamping  
upsetting

*hot jet exhaust*  
USE **high temperature gases**  
**jet exhaust**

*hot jets*  
USE **jet flow**

**hot machining**  
GS machining  
. **hot machining**  
RT forming techniques

*hot plasmas*  
USE **high temperature plasmas**

**hot pressing**  
DEF The simultaneous heating and molding of a compact.  
GS forming techniques  
. pressing (forming)  
. . **hot pressing**  
. . . hot isostatic pressing  
hardening (materials)  
. **hot pressing**  
. . hot isostatic pressing  
thermomechanical treatment  
. **hot pressing**  
. . hot isostatic pressing  
RT coining  
cold pressing  
compacting  
forging  
metal working  
∞ pressing  
sintering  
stamping  
upsetting

**hot stars**  
GS celestial bodies  
. stars  
. . early stars  
. . . **hot stars**  
. . . . A stars  
. . . . B stars  
. . . . shell stars  
. . . . . Sigma Orionis  
. . . . blue stars  
. . . . O stars

. . . . white dwarf stars  
. . . . Wolf-Rayet stars  
RT cataclysmic variables  
peculiar stars  
red dwarf stars

**hot surfaces**  
RT heat transfer  
Rayleigh-Benard convection  
∞ surfaces

**hot water rocket engines**  
GS engines  
. rocket engines  
. . **hot water rocket engines**

**hot weather**  
GS weather  
. **hot weather**  
RT heat stroke  
summer  
tropical regions

**hot working**  
DEF Controlled mechanical operations for shaping a product at temperatures above the recrystallization temperature. Used for hot forming.  
UF *hot forming*  
GS forming techniques  
. **hot working**  
. . ausforming  
RT bulging  
forging  
metal drawing  
metal spinning  
metal working  
pultrusion  
shearing  
upsetting

**hot-film anemometers**  
GS measuring instruments  
. anemometers  
. . **hot-film anemometers**  
RT flow measurement  
meteorological instruments  
sonic anemometers  
velocity measurement  
wind (meteorology)  
wind measurement  
wind vanes  
wind velocity  
wind velocity measurement

**HOTOL launch vehicle**  
DEF A British unmanned horizontal takeoff and landing single-stage-to-orbit launch vehicle. Later launches will be manned.  
GS aerospace vehicles  
. aerospace planes  
. . **HOTOL launch vehicle**  
launch vehicles  
. reusable launch vehicles  
. . single stage to orbit vehicles  
. . . **HOTOL launch vehicle**  
maneuverable spacecraft  
. aerospace planes  
. . **HOTOL launch vehicle**  
reentry vehicles  
. recoverable spacecraft  
. reusable spacecraft  
. . aerospace planes  
. . . **HOTOL launch vehicle**  
. . . single stage to orbit vehicles  
. . . . **HOTOL launch vehicle**  
soft landing spacecraft  
. aerospace planes  
. . **HOTOL launch vehicle**  
unmanned spacecraft  
. **HOTOL launch vehicle**  
RT launch vehicle configurations  
space shuttles  
space transportation  
spacecraft launching  
UK space program  
∞ vehicles

**hotshot wind tunnels**  
GS test facilities

. wind tunnels  
. . hypersonic wind tunnels  
. . . **hotshot wind tunnels**  
. . . hypervelocity wind tunnels  
. . . . **hotshot wind tunnels**  
RT blowdown wind tunnels  
shock tubes  
shock tunnels

**hot-wire anemometers**  
GS measuring instruments  
. anemometers  
. . **hot-wire anemometers**  
RT flow measurement  
flowmeters  
meteorological instruments  
velocity measurement

**hot-wire flowmeters**  
UF *hot-wire turbulence meters*  
GS measuring instruments  
. flowmeters  
. . **hot-wire flowmeters**  
RT Pirani gages  
plasma electrodes  
thermal conductivity  
turbulence meters

*hot-wire turbulence meters*  
USE **hot-wire flowmeters**  
**turbulence meters**

**Hound Dog missile**  
GS missiles  
. air to surface missiles  
. . **Hound Dog missile**  
RT turbojet engines

**Householder transformations**  
GS transformations (mathematics)  
. **Householder transformations**  
RT problem solving

**housekeeping (spacecraft)**  
GS cleaning  
. **housekeeping (spacecraft)**  
cleanliness  
. **housekeeping (spacecraft)**  
RT hygiene  
sanitation  
sterilization  
washing

**hosings**  
GS **hosings**  
. cowlings  
. doghouses (electronics)  
. radomes  
RT ∞ containers  
coverings  
domes (structural forms)  
enclosure  
enclosures  
fairings  
guards (shields)  
nacelles  
perforated shells  
protection  
protectors  
protuberances  
shells (structural forms)  
shielding  
walls

**Houston (TX)**  
GS cities  
. **Houston (TX)**  
RT texas

*hovercraft*  
USE **ground effect machines**

**hovercraft ground effect machines**  
UF *HD-1 ground effect machines*  
GS ground effect machines  
. **hovercraft ground effect machines**  
RT ∞ aircraft  
research aircraft

- water takeoff and landing aircraft
- hovering**
- GS maneuvers
    - . **hovering**
  - RT aerodynamic stability
    - Cushioncraft ground effect machine
    - flutter
    - ground effect machines
    - hovering rocket vehicles
    - terrain following
    - transition flight
    - V/STOL aircraft
    - vertical flight
    - whirl towers
- hovering rocket vehicles**
- GS rocket vehicles
    - . **hovering rocket vehicles**
  - RT hovering
    - soft landing spacecraft
  - $\infty$  vehicles
- hovering stability**
- GS dynamic characteristics
    - . dynamic stability
    - . . motion stability
    - . . . aircraft stability
    - . . . . **hovering stability**
    - stability
      - . dynamic stability
      - . . motion stability
      - . . . aircraft stability
      - . . . . **hovering stability**
  - RT attitude stability
    - directional stability
    - gyroscopic stability
    - lateral stability
    - longitudinal stability
    - low speed stability
    - whirl towers
- howitzers**
- GS weapons
    - . guns (ordnance)
    - . . artillery
    - . . . **howitzers**
  - RT ballistics
    - gun launchers
    - gunnery training
- HP-115 aircraft**
- UF *Handley Page HP-115 aircraft*
  - GS Handley Page aircraft
    - . **HP-115 aircraft**
    - jet aircraft
      - . **HP-115 aircraft**
    - monoplanes
      - . **HP-115 aircraft**
    - research vehicles
      - . research aircraft
      - . . **HP-115 aircraft**
      - tailless aircraft
        - . **HP-115 aircraft**
    - RT  $\infty$  aircraft
      - wing planforms
- HPRR**
- USE **Health Physics Research Reactor**
- HR diagram**
- USE **Hertzsprung-Russell diagram**
- HRB-1 helicopter**
- USE **CH-46 helicopter**
- HS-125 aircraft**
- USE **DH 125 aircraft**
- HS-748 aircraft**
- UF *AVRO Whitworth HS-748 aircraft*
  - GS Hawker Siddeley aircraft
    - . **HS-748 aircraft**
    - jet aircraft
      - . turboprop aircraft
      - . . **HS-748 aircraft**
    - monoplanes
      - . **HS-748 aircraft**
    - passenger aircraft
      - . **HS-748 aircraft**
- HS-801 aircraft**
- GS Hawker Siddeley aircraft
    - . **HS-801 aircraft**
    - jet aircraft
      - . **HS-801 aircraft**
    - reconnaissance aircraft
      - . **HS-801 aircraft**
  - RT aerial reconnaissance
    - $\infty$  aircraft
      - observation aircraft
      - photography
      - photoreconnaissance
- HSS-2 helicopter**
- USE **SH-3 helicopter**
- HTGR**
- USE **high temperature gas cooled reactors**
- HTML**
- USE **document markup languages**
- HTPB propellants**
- DEF Solid rocket propellants containing hydroxyl terminated polybutadiene as bonding material.
  - GS propellants
    - . rocket propellants
    - . . solid rocket propellants
    - . . . **HTPB propellants**
    - . solid propellants
    - . . solid rocket propellants
    - . . . **HTPB propellants**
  - RT plastic propellants
    - polybutadiene
- HTSC (superconductors)**
- USE **high temperature superconductors**
- HU-1 helicopter**
- USE **UH-1 helicopter**
- HU2K-1 helicopter**
- USE **UH-2 helicopter**
- Hubble constant**
- DEF The rate at which the velocity of recession of the galaxies increases with distance.
  - GS constants
    - . **Hubble constant**
  - RT cosmology
    - galaxies
    - irregular galaxies
    - red shift
    - velocity measurement
- Hubble diagram**
- GS cosmology
    - . **Hubble diagram**
  - RT barred galaxies
    - galactic radiation
    - galaxies
    - irregular galaxies
    - red shift
    - velocity measurement
- Hubble Space Telescope**
- UF *Large Space Telescope*
  - GS artificial satellites
    - . scientific satellites
    - . . astronomical satellites
    - . . . **Hubble Space Telescope**
    - observatories
      - . astronomical observatories
      - . . astronomical satellites
      - . . . **Hubble Space Telescope**
    - telescopes
      - . spaceborne telescopes
      - . . **Hubble Space Telescope**
  - RT faint object camera
    - James Webb Space Telescope
    - Space Shuttle payloads
    - spaceborne astronomy
    - ultraviolet astronomy
- hubs**
- UF *rotor hubs*
- RT spokes  
wheels
- Hudson Bay (Canada)**
- GS bays (topographic features)
    - . **Hudson Bay (Canada)**
  - RT Canada
- Hudson River (NY-NJ)**
- GS rivers
    - . **Hudson River (NY-NJ)**
  - RT New Jersey
    - New York
- Hueckel theory**
- RT  $\infty$  theories
- Hughes aircraft**
- GS **Hughes aircraft**
    - . AH-64 helicopter
    - . H-17 helicopter
    - . OH-6 helicopter
    - . TH-55 helicopter
    - . XV-9A aircraft
  - RT  $\infty$  aircraft
- Hugoniot adiabat**
- USE **Hugoniot equation of state**
- Hugoniot equation of state**
- UF *Hugoniot adiabat*
  - GS equations of state
    - . **Hugoniot equation of state**
  - RT compressible flow
    - $\infty$  equations
    - loads (forces)
    - one dimensional flow
    - shock waves
- HUL**
- USE **hardware utilization lists**
- hulls (structures)**
- GS **hulls (structures)**
    - . ship hulls
  - RT aircraft structures
    - bays (structural units)
    - bulkheads
    - fuselages
    - hydrofoils
    - keels
    - metal shells
    - perforated shells
    - seaplanes
    - shells (structural forms)
    - skin (structural member)
    - strakes
    - $\infty$  structures
    - SWATH (ship)
- hum**
- DEF Electrical disturbance at the power supply frequency or harmonics thereof.
  - RT acoustics
    - $\infty$  interference
    - $\infty$  noise
- human behavior**
- GS behavior
    - . **human behavior**
  - RT boredom
    - detachment
    - disorders
    - dithers
    - emotions
    - extroversion
    - introversion
    - lethargy
    - neuropsychiatry
    - panic
- human beings**
- UF *man*
  - GS animals
    - . vertebrates
    - . . mammals
    - . . . primates
    - . . . . **human beings**
  - RT aborigines
    - anthropology
    - census

## human body

children  
chimpanzees  
clinical medicine  
cultural resources  
demography  
females  
males  
man environment interactions  
parents  
patients  
race factors  
races (anthropology)  
youth

### human body

GS anatomy  
. **human body**  
RT appendages  
∞ bodies  
body measurement (biology)  
exercise physiology  
limbs (anatomy)  
lumbar region  
posture  
sciatic region

### human centrifuges

UF *piloted centrifuges*  
GS centrifuges  
. **human centrifuges**  
RT acceleration tolerance  
artificial gravity  
high gravity environments

### human engineering

USE **human factors engineering**

### human factors engineering

DEF Application of information on physical and psychological characteristics of man to the design of devices and systems for human use. Used for ergonomics and human engineering.

UF *ergonomics*  
*human engineering*  
RT ∞ aeronautics  
aircraft accidents  
aircraft hazards  
anthropometry  
architecture  
astronaut maneuvering equipment  
astronaut performance  
∞ aeronautics  
bioengineering  
biofeedback  
bionics  
body measurement (biology)  
brightness  
color  
comfort  
cybernetics  
education  
efficiency  
∞ engineering  
environmental engineering  
environments  
fatigue (biology)  
flat panel displays  
∞ flight stress  
glare  
human resources  
human-computer interface  
illuminating  
life support systems  
man machine systems  
manned space flight  
manual control  
monocular vision  
noise (sound)  
∞ performance  
pilot error  
production engineering  
psychological effects  
safety devices  
safety management  
situational awareness  
systems engineering  
teleoperators  
visibility  
vision  
wheelchairs

workstations

### human factors laboratories

GS laboratories  
. **human factors laboratories**  
RT environmental laboratories

### human immunodeficiency virus

(added August 1991)  
DEF A virus which attacks the human immune system and causes acquired immunodeficiency syndrome (AIDS).

UF *HIV (virus)*  
GS microorganisms  
. viruses  
. . **human immunodeficiency virus**  
RT acquired immunodeficiency syndrome  
antibodies  
immune systems  
immunology  
interferon  
vaccines  
viral diseases  
virulence

### human pathology

GS medical science  
. pathology  
. . **human pathology**  
RT cholera  
convulsions  
epilepsy  
patients

### human performance

GS **human performance**  
. astronaut performance  
. . blackout prevention  
. . operator performance  
. . pilot performance  
. . . blackout prevention  
RT abilities  
competition  
∞ endurance  
human resources  
information processing (biology)  
intelligence tests  
intravehicular activity  
mental health  
mental performance  
∞ performance  
pilot error  
psychomotor performance  
race factors  
sensorimotor performance  
visual tasks  
workloads (psychophysiology)

### human reactions

RT biological effects  
boredom  
competition  
emotional factors  
laughing  
noise pollution  
physiological effects  
psychological effects  
psychomotor performance  
∞ reaction  
reaction time  
reward (psychology)  
sensorimotor performance  
shock (physiology)  
vacillation

### human relations

UF *interpersonal relations*  
RT employee relations  
personnel management  
sociology

### human resources

DEF Those elements of support and capability that are provided by persons using their mental and physical capabilities.

RT education  
human factors engineering  
human performance  
management planning  
manpower

personnel  
personnel development  
personnel management

### human tolerances

GS tolerances (physiology)  
. **human tolerances**  
RT ∞ acceleration  
acceleration tolerance  
diving (underwater)  
∞ endurance  
heat acclimatization  
heat tolerance  
noise pollution  
noise tolerance  
orthostatic tolerance  
radiation tolerance  
shock (physiology)

### human wastes

GS wastes  
. metabolic wastes  
. . **human wastes**  
. . . feces  
. . . urine  
RT activated sludge  
air pollution  
environment pollution  
environmental surveys  
excretion  
liquid wastes  
organic wastes (fuel conversion)  
pollution  
sewage  
sewers  
solid wastes  
toilets  
waste disposal

### human-computer interface

UF *man-computer interface*  
*user-computer interface*  
GS interfaces  
. **human-computer interface**  
man machine systems  
. **human-computer interface**  
RT command languages  
computer aided design  
data processing terminals  
display devices  
document markup languages  
graphical user interface  
human factors engineering  
hypertext  
natural language processing  
pilot support systems  
query languages  
user requirements  
virtual reality

### Humason comet

GS celestial bodies  
. comets  
. . **Humason comet**  
RT solar system

### humerus

RT arm (anatomy)  
elbow (anatomy)

### humidity

DEF The amount of water vapor in the air. Specifically, relative humidity.

RT air conditioning  
atmospheric density  
atmospheric moisture  
body temperature  
climatology  
comfort  
corrosion  
dehumidification  
drop size  
dry heat  
environments  
hygral properties  
hygrometers  
lapse rate  
meteorological parameters  
meteorology  
mixing ratios

moisture  
 moisture content  
 moisture meters  
 perspiration  
 precipitation (meteorology)  
 psychological effects  
 psychrometers  
 refrigerating  
 temperature  
 vapor pressure  
 water  
 water vapor  
 weather forecasting

**humidity measurement**

RT hygrometers  
 ∞ measurement  
 meteorological instruments  
 moisture meters  
 psychrometers

*Hummingbird aircraft*

USE **XV-4 aircraft**

**Hungarian space program**

(added June 1989)

GS programs  
 . space programs  
 . . European space programs  
 . . . **Hungarian space program**  
 RT Hungary

**Hungary**

GS nations  
 . **Hungary**  
 RT Central Europe  
 Europe  
 Hungarian space program

*Hunter F-2 aircraft*

USE **F-2 aircraft**

*Hunting H-126 aircraft*

USE **H-126 aircraft**

*Hunting P-84 aircraft*

USE **jet provost aircraft**

**hurricanes**

DEF Tropical cyclones, especially in the West Indies, in which the wind velocity equals or exceeds 64 knots (73 mph).

GS storms  
 . storms (meteorology)  
 . . cyclones  
 . . . **hurricanes**  
 . . . . Anna hurricane  
 . . tropical storms  
 . . . **hurricanes**  
 . . . . Anna hurricane  
 RT climatology  
 cyclogenesis  
 meteorology  
 storm damage  
 storm surges  
 tornadoes  
 typhoons

*HUS-1 helicopter*

USE **UH-34 helicopter**

*Huskie helicopter*

USE **HH-43 helicopter**

*Hustler aircraft*

USE **B-58 aircraft**

*HUT (physiology)*

(added March 1998)

USE **head up tilt**

**Huygens principle**

DEF A very general principle applying to all forms of wave motion which states that every point on the instantaneous position of an advancing phase front (wave front) may be regarded as a source of secondary spherical wavelets. The position of the phase front a moment later is then determined as the envelope of all the secondary wavelets (ad infinitum).  
 RT diffraction

∞ optics  
 point sources  
 refraction  
 scattering  
 Schellkunoff principle  
 spherical waves  
 wave fronts  
 wave propagation

**Huygens probe**

(added May 1997)

GS ESA spacecraft  
 . **Huygens probe**  
 unmanned spacecraft  
 . space probes  
 . . **Huygens probe**  
 RT Cassini mission  
 satellite atmospheres  
 Titan  
 Titan atmosphere

**Hvittis chondrite**

GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . chondrites  
 . . . . **Hvittis chondrite**

**HVOF thermal spraying**

(added July 2001)

DEF Thermal spray process where the spray powder particles are injected into a high-velocity jet formed by the combustion of oxygen and fuel. Used to deposit strong, high-density coatings with low residual stress.

UF *high velocity oxy-fuel spraying*  
*high velocity oxygen fuel thermal spraying*

GS spraying  
 . flame spraying  
 . . **HVOF thermal spraying**

RT coating  
 metal spraying  
 plasma spraying  
 protective coatings  
 sprayed coatings

**hybrid circuits**

GS circuits  
 . **hybrid circuits**  
 RT electronic packaging  
 printed circuits  
 semiconductor devices  
 transistor circuits

*hybrid combustion*

USE **hybrid propellant rocket engines**

**hybrid composites**

(added April 1992)

GS composite materials  
 . **hybrid composites**  
 RT fiber composites  
 hybrid structures  
 laminates  
 metal matrix composites  
 polymer matrix composites  
 reinforced plastics  
 reinforcing fibers  
 resin matrix composites  
 superhybrid materials

**hybrid computers**

GS data processing equipment  
 . computers  
 . . **hybrid computers**  
 RT analog computers  
 digital computers

**hybrid navigation systems**

GS navigation  
 . **hybrid navigation systems**  
 RT navigation aids  
 navigation instruments  
 ∞ systems

**hybrid propellant rocket engines**

UF *hybrid combustion*  
 GS engines  
 . rocket engines

. . **hybrid propellant rocket engines**

. . . lithergol rocket engines  
 RT booster rocket engines  
 ∞ hybrid rocket engines  
 internal combustion engines  
 jet engines  
 liquid propellant rocket engines  
 restartable rocket engines  
 solid propellant rocket engines  
 sustainer rocket engines  
 Vernier engines

**hybrid propellants**

UF *lithergolic propellants*  
 GS propellants  
 . **hybrid propellants**  
 RT case bonded propellants  
 chemical fuels  
 cryogenic rocket propellants  
 gaseous rocket propellants  
 gelled rocket propellants  
 high energy fuels  
 high energy propellants  
 hypergolic rocket propellants  
 liquid rocket propellants  
 metal fuels  
 metal propellants  
 solid propellant ignition  
 solid propellants  
 solid rocket propellants

**hybrid propulsion**

UF *dual mode propulsion*  
 GS propulsion  
 . chemical propulsion  
 . . **hybrid propulsion**  
 RT jet engines  
 laser propulsion  
 rocket engines  
 rocket-based combined-cycle engines

∞ **hybrid rocket engines**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 RT ducted rocket engines  
 hybrid propellant rocket engines  
 liquid propellant rocket engines  
 lithergol rocket engines  
 solid propellant rocket engines  
 turboramjet engines

**hybrid structures**

DEF An assembly constructed of interconnected rigid and flexible structural shapes; designed to sustain dynamic, static, and other loads.

RT composite structures  
 elastic properties  
 flexible bodies  
 hybrid composites  
 rigid structures  
 structural stability  
 ∞ structures

*hybrids (biology)*

USE **genetic engineering**

*hybrid-Trefftz finite element method*

(added July 1998)

USE **finite element method**  
**Trefftz method**

**Hydra**

(added September 2006)

DEF Natural satellite of Pluto discovered May 2005.

GS celestial bodies  
 . natural satellites  
 . . Pluto satellites  
 . . . **Hydra**  
 RT Nix  
 Pluto (planet)

**hydrates**

RT aqueous solutions  
 water

**hydration**

DEF The formation of a compound by the combining of water with some other substance.

## hydraulic analogies

RT chemical reactions  
dehydration  
hydrolysis  
hydrophobicity

### hydraulic actuators

USE **actuators**  
**hydraulic equipment**

### hydraulic analogies

GS analogies  
. **hydraulic analogies**  
RT computerized simulation  
flow visualization  
fluierics  
fluidics  
gas flow  
numerical flow visualization  
wave propagation

### hydraulic control

UF *electrohydraulic control*  
RT automatic control  
∞ control  
electronic control  
engine control  
fluid power  
fluidics  
∞ hydraulics  
pneumatic control  
remote control  
solenoid valves

### hydraulic equipment

UF *hydraulic actuators*  
*hydraulic heating sources*  
*hydraulic pumps*  
*hydraulic systems*  
*hydraulic valves*  
GS **hydraulic equipment**  
. aircraft hydraulic systems  
RT airborne equipment  
automatic control valves  
cocks  
cushions  
∞ equipment  
fluid amplifiers  
fluid power  
fluid switching elements  
fly by tube control  
gates (openings)  
∞ hydraulics  
motors  
network analysis  
network synthesis  
pumps  
relief valves  
servocontrol  
servomechanisms  
shock absorbers  
∞ systems  
turbine wheels  
valves  
water hammer  
wheel brakes

### hydraulic fluids

DEF Liquids used in hydraulic systems for transmitting power.  
GS liquids  
. **hydraulic fluids**  
. . . Skydrol (trademark)  
RT fluid pressure  
fluid transmission lines  
∞ fluids  
high temperature fluids  
∞ hydraulics  
oils  
patch tests  
transmission fluids  
working fluids

### hydraulic heating sources

USE **heat sources**  
**hydraulic equipment**

### hydraulic jets

UF *water jets*  
GS fluid jets  
. **hydraulic jets**

RT jet flow

### hydraulic pumps

USE **hydraulic equipment**  
**pumps**

### hydraulic shock

GS mechanical shock  
. **hydraulic shock**

### hydraulic systems

USE **hydraulic equipment**

### hydraulic test tunnels

UF *water tunnels*  
GS test facilities  
. **hydraulic test tunnels**  
RT ∞ tunnels

### hydraulic valves

USE **hydraulic equipment**  
**valves**

### ∞ hydraulics

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT fluid dynamics  
fluid flow  
fluid mechanics  
fluid power  
hydraulic control  
hydraulic equipment  
hydraulic fluids  
hydrodynamic ram effect  
hydrodynamics  
hydrology  
hydromechanics  
hydrostatics  
impedance  
influence coefficient  
limnology  
mechanics (physics)  
pipes (tubes)  
pneumatics  
pressure heads  
thermo hydraulics  
water  
water flow  
water pressure

### hydrazides

RT hydrazines

### hydrazine borane

GS boron compounds  
. boron hydrides  
. . boranes  
. . . **hydrazine borane**  
hydrazines  
. **hydrazine borane**  
hydrogen compounds  
. hydrides  
. . boron hydrides  
. . . boranes  
. . . . **hydrazine borane**

### hydrazine engines

UF *NIMPHE (engine)*  
GS engines  
. rocket engines  
. . liquid propellant rocket engines  
. . . **hydrazine engines**  
RT monomethylhydrazines  
turbo rocket engines

### hydrazine nitrate

GS nitrogen compounds  
. nitrates  
. . inorganic nitrates  
. . . **hydrazine nitrate**

### hydrazine nitroform

GS esters  
. organic nitrates  
. . nitroforms  
. . . **hydrazine nitroform**  
explosives  
. **hydrazine nitroform**  
nitrogen compounds  
. nitrates

. . organic nitrates  
. . . nitroforms  
. . . . **hydrazine nitroform**  
propellants  
. **hydrazine nitroform**

### hydrazine perchlorates

GS halogen compounds  
. chlorine compounds  
. perchlorates  
. . . **hydrazine perchlorates**  
hydrazines  
. **hydrazine perchlorates**

### hydrazines

GS **hydrazines**  
. chlorpromazine  
. dihydrazine  
. dimethylhydrazines  
. ethylene dihydrazine  
. hydrazine borane  
. hydrazine perchlorates  
. methylhydrazine  
. . monomethylhydrazines  
. tetrafluorohydrazine  
RT aroazine  
amines  
hydrazides  
hydrazones  
liquid rocket propellants  
rocket propellants

### hydrazinium compounds

GS nitrogen compounds  
. **hydrazinium compounds**  
RT ∞ chemical compounds

### hydrazoic acid

GS acids  
. **hydrazoic acid**  
nitrogen compounds  
. **hydrazoic acid**  
RT nitrogen hydrides

### hydrazones

GS nitrogen compounds  
. **hydrazones**  
RT hydrazines

### hydrazonium compounds

RT ∞ chemical compounds

### hydrides

GS hydrogen compounds  
. **hydrides**  
. borohydrides  
. . aluminum borohydrides  
. . . beryllium borohydrides  
. boron hydrides  
. . aluminum borohydrides  
. . . beryllium borohydrides  
. . boranes  
. . . carborane  
. . . . hydrazine borane  
. . . . pentaboranes  
. diborane  
. dihydrides  
. metal hydrides  
. . aluminum hydrides  
. . . aluminum borohydrides  
. . . beryllium hydrides  
. . . cesium hydrides  
. . . lithium hydrides  
. . . . lithium aluminum hydrides  
. . . potassium hydrides  
. . . sodium hydrides  
. . . nitrogen hydrides  
. . . amino radical  
. phosphines  
. silanes  
. . chlorosilanes  
. . . methyl chlorosilanes  
. . zirconium hydrides  
RT deuterides

hydrogen production

*hydroacoustics*USE **underwater acoustics***hydroaeromechanics*USE **aerodynamics****hydroballistics**GS ballistics  
. **hydroballistics**RT ballistic ranges  
hydrodynamics  
torpedoes  
underwater explosions  
underwater trajectories*hydrobarophones*USE **hydrophones****hydroboration**GS chemical reactions  
. **hydroboration****hydrobromic acid**GS acids  
. **hydrobromic acid**  
halogen compounds  
. bromine compounds  
. bromides  
. . . **hydrobromic acid**  
. halides  
. bromides  
. . . **hydrobromic acid****hydrobromides**GS halogen compounds  
. bromine compounds  
. bromides  
. . . **hydrobromides**  
. halides  
. bromides  
. . . **hydrobromides**  
hydrogen compounds  
. **hydrobromides****hydrocarbon combustion**GS combustion  
. **hydrocarbon combustion**  
RT explosions  
fuel combustion  
oxidation  
propellant combustion  
smog**hydrocarbon fuel production**GS fuel production  
. **hydrocarbon fuel production**  
RT agriculture  
bioconversion  
biomass energy production  
energy technology  
hydrogen fuels  
lignite  
solvent refined coal  
waste utilization**hydrocarbon fuels**GS fuels  
. chemical fuels  
. . . **hydrocarbon fuels**  
. . . diesel fuels  
. . . fossil fuels  
. . . . coal  
. . . . anthracite  
. . . . lignite  
. . . . solvent refined coal  
. . . crude oil  
. . . natural gas  
. . . . liquefied natural gas  
. . . peat  
. . . shale oil  
. . . gasoline  
. . . jet engine fuels  
. . . . JP-4 jet fuel  
. . . . JP-5 jet fuel  
. . . . JP-6 jet fuel  
. . . . JP-7 jet fuel  
. . . . JP-8 jet fuel  
. . . synthaneRT acetylene  
aircraft fuels  
alkanes  
amines  
automobile fuels  
butadiene  
clean fuels  
coal gasification  
coal liquefaction  
coal utilization  
endothermic fuels  
energy policy  
environmental chemistry  
ethane  
ethylene  
fuel production  
heptanes  
hexenes  
high energy fuels  
hydrogen fuels  
hydrogen-based energy  
hypergolic rocket propellants  
kerogen  
kerosene  
methanation  
methane  
paraffins  
propane  
retort processing  
rocket propellants  
shale oil  
storable propellants  
synthetic fuels**hydrocarbon poisoning**GS diseases  
. toxic diseases  
. . . **hydrocarbon poisoning**  
toxicity  
. **hydrocarbon poisoning**  
RT benzene poisoning  
industrial safety  
 $\infty$  poisoning  
smog  
toxicity and safety hazard  
toxicology**hydrocarbons**GS organic compounds  
. **hydrocarbons**  
. . . aliphatic hydrocarbons  
. . . . alkanes  
. . . . . butanes  
. . . . . cetane  
. . . . . ethane  
. . . . . heptanes  
. . . . . methane  
. . . . . nitropropane  
. . . . . nonanes  
. . . . . octanes  
. . . . . paraffins  
. . . . . . . . . . . ceresin  
. . . . . pentanes  
. . . . . . . . . . . neopentane  
. . . . . propane  
. . . alkenes  
. . . . butenes  
. . . . ethylene  
. . . . . vinylidene  
. . . . hexenes  
. . . . propylene  
. . . . trienes  
. . . alkynes  
. . . . . acetylene  
. . . . . oxyacetylene  
. . . dienes  
. . . . butadiene  
. . . . heptadiene  
. . . . hexadiene  
. . . . . polybutadiene  
. . . carotenoids  
. . . carotene  
. . . cubane  
. . . cyanoacetylene  
. . . cyclic hydrocarbons  
. . . anthracene  
. . . benzene  
. . . chlorobenzenes  
. . . colchicine. . . cyclobutane  
. . . cyclohexane  
. . . cyclopropane  
. . . durene  
. . . indene  
. . . menthol  
. . . naphthalene  
. . . naphthenes  
. . . polycyclic aromatic hydrocarbons  
. . . diphenyl compounds  
. . . diphenyl hydantoin  
. . . fluorohydrocarbons  
. . . carbon tetrafluoride  
. . . chlorofluoromethane  
. . . . polytetrafluoroethylene  
. . . . teflon (trademark)  
. . . mesitylene  
. . . methylene  
. . . methylidyne  
. . . natural gas  
. . . . liquefied natural gas  
. . . phenanthrene  
. . . pyrenes  
. . . quinoxalines  
. . . stilbene  
. . . toluene  
. . . triphenyls  
. . . xylene  
RT  $\infty$  aromatic compounds  
carbon compounds  
cracking (chemical engineering)  
organic peroxides**hydrochloric acid**GS acids  
. **hydrochloric acid**  
halogen compounds  
. chlorine compounds  
. . . chlorides  
. . . . hydrogen chlorides  
. . . . **hydrochloric acid**  
. halides  
. . . chlorides  
. . . . hydrogen chlorides  
. . . . **hydrochloric acid****hydrochlorides**GS halogen compounds  
. chlorine compounds  
. . . chlorides  
. . . . **hydrochlorides**  
. halides  
. . . chlorides  
. . . . **hydrochlorides**  
RT hydrogen chlorides**hydroclimatology**

DEF The study of the physical and often the chemical factors that characterize a particular environment.

GS climatology  
. **hydroclimatology**  
RT agroclimatology  
hydrography  
hydrology  
meteorology  
oceanography**hydrocracking**

DEF Technique for the catalytic conversion of coal into liquid fuels.

GS chemical reactions  
. cracking (chemical engineering)  
. . . **hydrocracking**  
. . . hydrogenolysis  
. . . **hydrocracking**  
decomposition  
. cracking (chemical engineering)  
. . . **hydrocracking**  
. . . hydrogenolysis  
. . . **hydrocracking**  
fractionation  
. **hydrocracking**  
RT coal gasification  
coal liquefaction**hydrocyanic acid**UF *hydrogen cyanides*  
*prussic acid*  
GS acids



## hydrodynamic coefficients

- . **hydrocyanic acid**
- hydrogen compounds
- . **hydrocyanic acid**
- nitrogen compounds
- . **hydrocyanic acid**
- RT CN emission
- HCN lasers

### hydrodynamic coefficients

DEF The factors producing motions in floating objects in liquids.

GS coefficients

- . **hydrodynamic coefficients**
- RT computational fluid dynamics
- ∞ drag coefficients
- flow distribution
- flow velocity
- liquid flow
- sea roughness
- ship hulls
- steady flow
- unsteady flow
- water waves

### hydrodynamic equations

GS equations of motion

- . kinetic equations
- . . **hydrodynamic equations**
- . . . Burnett equations
- . . . Helmholtz vorticity equation

RT Boltzmann transport equation

∞ equations

- flow stability
- flow theory
- fluid mechanics
- gas dynamics
- hydrodynamics
- meteorology
- plasma dynamics

### hydrodynamic ram effect

DEF The physical effect (force) transmitted to the walls of a liquid filled container by the action of a projectile penetrating the container and transferring its energy to the liquid as kinetic energy. The fluid, in turn, transfers this kinetic energy to the walls of the container, causing excessive structural damage.

UF *ram effect (hydrodynamics)*

RT ∞ effects

- fluid filled shells
- ∞ hydraulics
- hypervelocity impact
- impact
- kinetic energy
- liquid filled shells
- momentum transfer
- penetration

### hydrodynamic stability

USE **flow stability**

### hydrodynamic tunnels

USE **plasma jet wind tunnels**

### hydrodynamics

GS mechanics (physics)

- . fluid mechanics
- . . fluid dynamics
- . . . **hydrodynamics**
- . . . . elastohydrodynamics
- . . . . electrohydrodynamics
- . . . . magnetohydrodynamics
- . . hydromechanics
- . . . **hydrodynamics**
- . . . . elastohydrodynamics
- . . . . electrohydrodynamics
- . . . . magnetohydrodynamics

RT ballast (mass)

∞ dynamics

- Earth sciences
- Euler equations of motion
- flow theory
- fluid flow
- fluid power
- gas dynamics
- ∞ hydraulics
- hydroballistics
- hydrodynamic equations
- hydrostatics

- internal flow
- Krook equation
- Lagrange coordinates
- ocean dynamics
- pressure gradients
- pressure heads
- seepage
- ship hulls
- thermohydraulics
- water
- water flow
- water hammer
- water pressure

### hydroelasticity

GS mechanical properties

- . elastic properties
- . . **hydroelasticity**

RT compressibility

- compressible fluids
- modulus of elasticity
- thermoelasticity
- viscoelasticity

### hydroelectric power stations

UF *hydropower stations*

GS stations

- . **hydroelectric power stations**

RT electric power plants

- electric power transmission
- hydroelectricity
- ∞ power plants
- ∞ power transmission
- turbogenerators
- water wheels

### hydroelectricity

DEF Electric power produced by water power using water wheels, turbogenerators, or other conversion equipment.

GS electricity

- . **hydroelectricity**
- renewable energy
- . **hydroelectricity**

RT dams

- electric current
- ∞ electric power
- hydroelectric power stations
- ∞ power plants
- turbogenerators

### hydrofluoric acid

UF *hydrogen fluorides*

GS acids

- . **hydrofluoric acid**
- halogen compounds
- . fluorine compounds
- . . fluorides
- . . . **hydrofluoric acid**
- . . halides
- . . fluorides
- . . . **hydrofluoric acid**

### hydrofoil boats

USE **hydrofoil craft**

### hydrofoil craft

UF *hydrofoil boats*

RT captured air bubble vehicles

- hydrofoils
- hydroplanes (vehicles)
- ships

### hydrofoil oscillations

GS oscillations

- . **hydrofoil oscillations**

RT flow stability

- flutter
- hydrofoils
- supercavitating flow

### hydrofoils

GS **hydrofoils**

- . keels

RT airfoils

- ∞ blades
- elevators (control surfaces)
- fins
- ∞ foils
- foils (materials)

- guide vanes
- hulls (structures)
- hydrofoil craft
- hydrofoil oscillations
- hydroplanes (surfaces)
- hydroplaning
- landing gear
- marine rudders
- ships
- skis
- streamlining
- tail assemblies

### hydroforming

GS metal working

- . **hydroforming**

RT dehydrogenation

### hydrogen

GS chemical elements

- . **hydrogen**
- . . hydrogen isotopes
- . . . deuterium
- . . . hydrogen 4
- . . . metallic hydrogen
- . . . tritium
- . liquid hydrogen gases
- . **hydrogen**
- . . hydrogen isotopes
- . . . deuterium
- . . . hydrogen 4
- . . . metallic hydrogen
- . . . tritium
- . liquid hydrogen

RT Balmer series

- deuterium plasma fuels
- hydrogen atoms
- hydrogen ions
- hydrogen plasma
- hydrogenation
- hydrogenolysis
- hydronium ions
- metallicity
- Neptune atmosphere
- ortho hydrogen
- para hydrogen
- Paschen series
- Rydberg series
- synthane
- Uranus atmosphere

### hydrogen 2

USE **deuterium**

### hydrogen 3

USE **tritium**

### hydrogen 4

GS chemical elements

- . hydrogen
- . . hydrogen isotopes
- . . . **hydrogen 4**
- . nuclides
- . isotopes
- . . . hydrogen isotopes
- . . . . **hydrogen 4**
- gases
- . hydrogen
- . . hydrogen isotopes
- . . . **hydrogen 4**

### hydrogen air fuel cells

USE **hydrogen oxygen fuel cells**

### hydrogen atoms

GS atoms

- . **hydrogen atoms**

RT H I regions

- hydrogen

### hydrogen azides

GS explosives

- . **hydrogen azides**
- nitrogen compounds
- . azides (inorganic)
- . . **hydrogen azides**
- propellants

- . **hydrogen azides**
- hydrogen bombs*
- USE **fusion weapons**
- hydrogen bonds**
- GS chemical bonds
- . **hydrogen bonds**
- RT molecular structure
- water
- hydrogen chloride lasers*
- USE **HCL lasers**
- hydrogen chlorides**
- GS halogen compounds
- . chlorine compounds
- . chlorides
- . . . **hydrogen chlorides**
- . . . . hydrochloric acid
- . halides
- . . chlorides
- . . . **hydrogen chlorides**
- . . . . hydrochloric acid
- RT hydrochlorides
- hydrogen clouds**
- GS **hydrogen clouds**
- . H I regions
- . H II regions
- . Orion nebula
- RT ∞ clouds
- drop size
- galactic rotation
- gases
- molecular clouds
- neutral gases
- plasma clouds
- spin temperature
- star formation
- vapor phases
- vapors
- hydrogen compounds**
- GS **hydrogen compounds**
- . deuterium compounds
- . deuterides
- . . deuterium fluorides
- . . heavy water
- . hydrides
- . . borohydrides
- . . . aluminum borohydrides
- . . . beryllium borohydrides
- . . boron hydrides
- . . . aluminum borohydrides
- . . . beryllium borohydrides
- . . . boranes
- . . . . carborane
- . . . . hydrazine borane
- . . . . pentaboranes
- . . diborane
- . . dihydrides
- . . metal hydrides
- . . . aluminum hydrides
- . . . . aluminum borohydrides
- . . . beryllium hydrides
- . . . cesium hydrides
- . . . lithium hydrides
- . . . . lithium aluminum hydrides
- . . . potassium hydrides
- . . . sodium hydrides
- . . nitrogen hydrides
- . . . amino radical
- . . phosphines
- . . silanes
- . . . chlorosilanes
- . . . methyl chlorosilanes
- . . zirconium hydrides
- . hydrobromides
- . hydrocyanic acid
- . hydrogen peroxide
- . hydrogen sulfide
- . hydrosulfites
- . light water
- RT acids
- ∞ chemical compounds
- water
- hydrogen cyanide lasers*
- USE **HCN lasers**
- hydrogen cyanides*
- USE **hydrocyanic acid**
- hydrogen deuterium oxide*
- USE **heavy water**
- hydrogen embrittlement**
- DEF A decrease in fracture strength of metals due to the incorporation of hydrogen in the metal lattice.
- GS embrittlement
- . **hydrogen embrittlement**
- RT chemisorption
- gas-metal interactions
- iron
- steels
- hydrogen engines**
- DEF Internal combustion engines utilizing gaseous hydrogen as the fuel.
- GS engines
- . air breathing engines
- . . gas turbine engines
- . . . **hydrogen engines**
- . . . internal combustion engines
- . . gas turbine engines
- . . . **hydrogen engines**
- . turbine engines
- . . gas turbine engines
- . . . **hydrogen engines**
- RT aircraft engines
- automobiles
- hydrogen fluoride lasers*
- USE **HF lasers**
- hydrogen fluorides*
- USE **hydrofluoric acid**
- hydrogen fuels**
- GS fuels
- . chemical fuels
- . . liquid fuels
- . . . **hydrogen fuels**
- RT cryogenic rocket propellants
- deuterium
- fuel cells
- fuel production
- gaseous rocket propellants
- gelled propellants
- hydrocarbon fuel production
- hydrocarbon fuels
- hydrogen-based energy
- liquid hydrogen
- liquid rocket propellants
- ramjet engines
- slush hydrogen
- water splitting
- hydrogen ions**
- GS ions
- . **hydrogen ions**
- RT acidity
- H II regions
- hydrogen
- hydronium ions
- pH
- pH factor
- positive ions
- protons
- hydrogen isotopes**
- GS chemical elements
- . hydrogen
- . . **hydrogen isotopes**
- . . . deuterium
- . . . hydrogen 4
- . . . metallic hydrogen
- . . . tritium
- . nuclides
- . . isotopes
- . . . **hydrogen isotopes**
- . . . . deuterium
- . . . . hydrogen 4
- . . . . metallic hydrogen
- . . . . tritium
- . . . . gases
- . . . . hydrogen
- . . . . **hydrogen isotopes**
- . . . . deuterium
- . . . . hydrogen 4
- . . . . metallic hydrogen
- . . . . tritium
- hydrogen masers
- DEF A stimulated emission device in which hydrogen gas provides an output signal with a high degree of stability and spectral purity.
- GS stimulated emission devices
- . masers
- . . gas masers
- . . . **hydrogen masers**
- hydrogen metabolism**
- DEF The physical and chemical processes by which an organism transforms the complex hydrogen components of foodstuffs into simple hydrogen compounds by dissimilation and catabolism in the production of energy.
- GS metabolism
- . **hydrogen metabolism**
- RT carbohydrate metabolism
- nitrogen metabolism
- oxygen metabolism
- respiration
- secretions
- hydrogen oxygen engines**
- DEF Engines using liquid hydrogen as fuel and liquid oxygen as oxidizer. Used for hydrox engines and lox-hydrogen engines.
- UF *hydrox engines*
- LOX-hydrogen engines*
- GS engines
- . rocket engines
- . . liquid propellant rocket engines
- . . . **hydrogen oxygen engines**
- . . . . J-2 engine
- . . . . M-1 engine
- . . . . RL-10-A-1 engine
- . . . . RL-10-A-3 engine
- RT auxiliary propulsion
- liquid air cycle engines
- space station propulsion
- turborocket engines
- hydrogen oxygen fuel cells**
- UF *hydrogen air fuel cells*
- GS electric generators
- . direct power generators
- . . fuel cells
- . . . **hydrogen oxygen fuel cells**
- electrochemical cells
- . fuel cells
- . . **hydrogen oxygen fuel cells**
- RT phosphoric acid fuel cells
- hydrogen perchlorate**
- GS halogen compounds
- . chlorine compounds
- . . perchlorates
- . . . **hydrogen perchlorate**
- hydrogen peroxide**
- GS chalcogenides
- . oxides
- . . anhydrides
- . . . peroxides
- . . . . inorganic peroxides
- . . . . **hydrogen peroxide**
- . . . . dioxides
- . . . . **hydrogen peroxide**
- hydrogen compounds
- . **hydrogen peroxide**
- RT rocket oxidizers
- hydrogen plasma**
- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **hydrogen plasma**
- . . . . . deuterium plasma
- . . . . . corpuscular radiation
- . . . . . energetic particles

## hydrogen production

. . . plasmas (physics)  
. . . . **hydrogen plasma**  
. . . . . deuterium plasma

RT argon plasma  
deuterium  
helium plasma  
hydrogen  
oxygen plasma  
solar wind  
Stark effect

### hydrogen production

DEF Production of hydrogen for fuel purposes by photosynthetic, chemical, electrical, thermal, electrochemical, or other means.

RT electrolysis  
energy conversion  
fuels  
hydrides  
hydrogen-based energy  
hydrolysis  
lignite  
solar energy conversion  
thermal dissociation  
water splitting

### hydrogen recombinations

GS recombination reactions  
. **hydrogen recombinations**

### hydrogen sulfide

GS chalcogenides  
. sulfides  
. . inorganic sulfides  
. . . **hydrogen sulfide**  
hydrogen compounds  
. **hydrogen sulfide**  
sulfur compounds  
. sulfides  
. . inorganic sulfides  
. . . **hydrogen sulfide**

### hydrogenation

GS chemical reactions  
. reduction (chemistry)  
. . **hydrogenation**

RT asphaltenes  
cyclohexane  
dehydrogenation  
hydrogen  
refining

### hydrogen-based energy

RT ∞ energy  
energy technology  
fuel cells  
gas mixtures  
hydrocarbon fuels  
hydrogen fuels  
hydrogen production  
liquid hydrogen  
nickel hydrogen batteries  
renewable energy

### hydrogenolysis

GS chemical reactions  
. **hydrogenolysis**  
. . hydrocracking  
decomposition  
. **hydrogenolysis**  
. . hydrocracking

RT cracking (chemical engineering)  
dehydrogenation  
hydrogen  
∞ reduction

### hydrogenomonas

GS autotrophs  
. **hydrogenomonas**  
microorganisms  
. bacteria  
. . **hydrogenomonas**

### hydrogeology

DEF The science that deals with subsurface waters and with related geologic aspects of surface waters. The term is also used in the more restrictive sense of ground water geology.

GS geology  
. **hydrogeology**

hydrology  
. **hydrogeology**

RT aquifers  
core sampling  
erosion  
flood plains  
flood predictions  
geysers  
glaciology  
hydrology models  
hydrostatics  
∞ science  
soil erosion  
stratigraphy  
watersheds

### hydrography

DEF The science that deals with the physical aspects of all waters on the Earth's surface, especially the compilation of navigational charts.

RT geophysics  
hydroclimatology  
hydrology  
hydrometeorology  
ice mapping  
limnology  
meteorology  
ocean currents  
ocean surface  
oceanography

### hydrokinetics

USE **hydromechanics**

### hydrological cycle

UF *water cycle (hydrology)*

GS cycles  
. **hydrological cycle**

RT air water interactions  
Earth hydrosphere  
evaporation  
hydrology  
hydrology models  
hydrometeorology  
precipitation (meteorology)

### hydrology

(added February 1991)

DEF The science that deals with global water (both liquid and solid), its properties, circulation, and distribution, on and under the Earth's surface and in the atmosphere through evapotranspiration or is discharged into oceans. In recent years, the scope of hydrology has been expanded to include environmental and economic aspects.

UF *hydroscience*

GS **hydrology**

. hydrogeology

RT alluvium  
aquifers  
climatology  
drainage  
drainage patterns  
drought  
Earth hydrosphere  
Earth planetary structure  
Earth sciences  
flood control  
flood damage  
flood plains  
flood predictions  
floods  
geochemistry  
geophysics  
Great Salt Lake (UT)

∞ hydraulics

hydroclimatology  
hydrography  
hydrological cycle  
hydrometeorology  
hydrometeors  
ice mapping  
International Hydrological Decade  
Lake Erie  
Lake Huron  
Lake Michigan  
Lake Ontario  
Lake Superior  
limnology

marine chemistry  
meteorology  
oceanography  
polar meteorology  
precipitation (meteorology)  
rain  
streams  
structural properties (geology)  
water  
water management  
water resources  
watersheds

### hydrology models

DEF Mathematical or physical representations by which the circulation, distribution, and properties of the waters of the Earth can be studied.

GS models  
. **hydrology models**

RT climate models  
drainage  
floods  
hydrogeology  
hydrological cycle  
precipitation (meteorology)  
rain  
streams  
water flow

### hydrolysis

GS chemical reactions  
. **hydrolysis**

RT ammonolysis  
cracking (chemical engineering)  
extraction  
hydration  
hydrogen production  
phosphatases

### hydromagnetic flow

USE **magnetohydrodynamic flow**

### hydromagnetic stability

USE **magnetohydrodynamic stability**

### hydromagnetic waves

USE **magnetohydrodynamic waves**

### hydromagnetics

USE **magnetohydrodynamics**

### hydromagnetism

USE **magnetohydrodynamics**

### hydromechanics

UF *hydrokinetics*

GS mechanics (physics)  
. fluid mechanics  
. . **hydromechanics**  
. . . hydrodynamics  
. . . . elastrohydrodynamics  
. . . . electrohydrodynamics  
. . . . magnetohydrodynamics  
. . . hydrostatics  
. . . magnetohydrostatics

RT fluid dynamics  
fluid flow

∞ hydraulics  
kinetics

∞ science  
water

### hydrometallurgy

RT chlorination  
electrodialysis  
filtration  
ion exchanging  
leaching

∞ metallurgy

∞ precipitation  
precipitation (chemistry)  
refining  
sulfation

### hydrometeorology

GS meteorology  
. **hydrometeorology**  
. . marine meteorology

RT agrometeorology

hydrography  
hydrological cycle  
hydrology  
precipitation (meteorology)  
water balance

**hydrometeors**

(added March 1995)

DEF A minute droplet of water or crystal of ice falling through or suspended in the atmosphere.

GS condensates  
. hydrometeors  
RT atmospheric moisture  
dew  
drops (liquids)  
fog  
hydrology  
ice nuclei  
precipitation (meteorology)

**hydrometers**

DEF Instruments used for measuring the specific gravity of a liquid.

GS measuring instruments  
. hydrometers  
RT chemical analysis  
density (mass/volume)  
density measurement  
weight measurement

**hydronium ions**

GS ions  
. molecular ions  
. . hydronium ions  
. positive ions  
. . hydronium ions  
RT hydrogen  
hydrogen ions

**hydrophobicity**

(added June 2000)

DEF The degree to which a substance is insoluble in water, or resists wetting or hydration.

GS hygral properties  
. hydrophobicity  
RT adsorption  
chemical properties  
hydration  
hygroscopicity  
moisture resistance  
∞ properties  
solubility  
sorption  
surface properties  
surfactants  
waterproofing  
wettability  
wetting

**hydrophones**

DEF Microphones suitable for use in water or other liquid. Used for hydrobarophones.

UF hydrobarophones  
GS transducers  
. sound transducers  
. . electroacoustic transducers  
. . . hydrophones  
RT microphones  
sonar  
sonobuoys

**hydroplanes (surfaces)**

UF hydroskis  
RT hydrofoils  
hydroplaning  
skis  
∞ systems

**hydroplanes (vehicles)**

RT hydrofoil craft  
hydroplaning  
∞ vehicles

**hydroplaning**

RT hydrofoils  
hydroplanes (surfaces)  
hydroplanes (vehicles)  
skid landings  
skidding

water landing

**hydroponics**

DEF Growing of plants in a nutrient with the mechanical support of an inert medium such as sand.

RT agriculture  
aquatic plants  
aquaculture  
plants (botany)  
vegetation growth

**hydropower stations**

USE hydroelectric power stations

**hydropyrolysis**

DEF A coal-to-liquid process in which bituminous coal, lignite, tars, sand and related materials are rapidly heated to 1000-1100 degrees K in pressurized hydrogen gasification reactors to generate pure methane.

GS gasification  
. coal gasification  
. . hydropyrolysis  
RT coal  
coal liquefaction  
lignite  
methanation  
methane

**hydrosience**

USE hydrology

**hydroskis**

USE hydroplanes (surfaces)

**hydrosphere (Earth)**

USE Earth hydrosphere

**hydrospinning**

GS forming techniques  
. metal spinning  
. . hydrospinning  
metal working  
. metal spinning  
. . hydrospinning  
spin  
. metal spinning  
. . hydrospinning

**hydrostatic pressure**

DEF A state of stress in which all the principal stresses are equal (and there is no shear stress).

GS pressure  
. static pressure  
. . hydrostatic pressure  
RT center of pressure  
elevation  
head (fluid mechanics)  
hydrostatics  
isostatic pressure  
pressure dependence  
pressure heads  
transition pressure  
water pressure

**hydrostatics**

GS mechanics (physics)  
. fluid mechanics  
. . hydromechanics  
. . . hydrostatics  
. . . . magnetohydrostatics  
statics  
. hydrostatics  
. . magnetohydrostatics

RT aerostatics  
elevation  
head (fluid mechanics)  
∞ hydraulics  
hydrodynamics  
hydrogeology  
hydrostatic pressure  
isostasy  
pressure gradients  
pressure heads  
water

water pressure

**hydrosulfites**

GS hydrogen compounds  
. hydrosulfites  
sulfur compounds  
. sulfites  
. . hydrosulfites

**hydrothermal crystal growth**

GS growth  
. crystal growth  
. . hydrothermal crystal growth  
RT electroepitaxy

**hydrothermal stress analysis**

DEF The evaluation of the combined effects of temperature-humidity cycling.

RT hydrothermal systems  
hygral properties  
hygroscopicity  
moisture content  
moisture resistance

**hydrothermal systems**

DEF Energy systems utilizing hot water from geysers, hot springs, solar heating, and other sources.

RT aquifers  
energy conversion  
geothermal resources  
geysers  
heating  
hydrothermal stress analysis  
solar heating  
submarine hydrothermal vents  
∞ systems

**hydrox engines**

USE hydrogen oxygen engines

**hydroxides**

GS hydroxides  
. lithium hydroxides  
. potassium hydroxides  
. sodium hydroxides  
RT alkalis

**hydroxycorticosteroid**

GS organic compounds  
. lipids  
. . steroids  
. . . corticosteroids  
. . . . hydroxycorticosteroid  
. . . . . cortisone  
secretions  
. endocrine secretions  
. . hormones  
. . . corticosteroids  
. . . . hydroxycorticosteroid  
. . . . . cortisone  
RT adrenal metabolism

**hydroxyl compounds**

GS hydroxyl compounds  
. alcohols  
. . ethyl alcohol  
. . glycols  
. . isopropyl alcohol  
. . methyl alcohol  
. . phenols  
. . . bisphenols  
. . . cresols  
. . . phloroglucinol  
. . . thymol  
. . polyvinyl alcohol  
. . triols  
. . . cyanuric acid  
RT ∞ chemical compounds  
organic compounds

**hydroxyl emission**

GS electromagnetic radiation  
. radio waves  
. . radio emission  
. . . hydroxyl emission  
emission  
. radio emission  
. . hydroxyl emission  
RT emission spectra

## hydroxyl radicals

radio sources (astronomy)

### hydroxyl radicals

- GS radicals
  - . free radicals
  - . . **hydroxyl radicals**
- RT alcohols
  - ∞ chemistry
  - formyl ions
  - glycols
  - ions

### hydroxylamine sulfate

- GS organic compounds
  - . amines
  - . . **hydroxylamine sulfate**
- sulfur compounds
  - . sulfates
  - . . **hydroxylamine sulfate**

### hydroxylammonium perchlorates

- GS ammonium compounds
  - . **hydroxylammonium perchlorates**
- halogen compounds
  - . chlorine compounds
  - . . perchlorates
  - . . . **hydroxylammonium perchlorates**

### hygiene

- GS **hygiene**
  - . oral hygiene
- RT bathing
  - cleanliness
  - consumables (spacecrew supplies)
  - health
  - housekeeping (spacecraft)
  - public health
  - sanitation

### hygral properties

- DEF The affinity of something for moisture.
- GS **hygral properties**
  - . hydrophobicity
- RT humidity
  - hydrothermal stress analysis
  - moisture
  - porosity
  - ∞ properties

### hygrometers

- DEF Instruments for measuring the humidity of the atmosphere.
- GS measuring instruments
  - . moisture meters
  - . . **hygrometers**
  - . . . psychrometers
- RT chemical analysis
  - dew point
  - humidity
  - humidity measurement
  - meteorological instruments

### hygroscopicity

- RT chemical properties
  - hydrophobicity
  - hydrothermal stress analysis
  - material absorption
  - moisture content
  - moisture resistance
- ∞ physical properties
  - solubility
  - wettability

### Hyla-Star rocket vehicle

- GS launch vehicles
  - . **Hyla-Star rocket vehicle**
- rocket vehicles
  - . single stage rocket vehicles
  - . . **Hyla-Star rocket vehicle**
- RT liquid propellant rocket engines
  - Titan 2 ICBM

### Hylleraas coordinates

- GS coordinates
  - . **Hylleraas coordinates**
- RT quantum mechanics

two body problem

### hyoscine

- UF *scopolamine*
- GS bases (chemical)
  - . alkaloids
  - . . **hyoscine**
- epoxy compounds
  - . **hyoscine**
- nitrogen compounds
  - . alkaloids
  - . . **hyoscine**
- organic compounds
  - . amines
  - . . **hyoscine**
- cyclic compounds
  - . . heterocyclic compounds
  - . . . alkaloids
  - . . . . **hyoscine**

### hyperbaric chambers

DEF Chambers used to induce a decrease in ambient pressure as would occur in ascending to altitude. This type of chamber is primarily used for training and experimental purposes. It is also called an altitude chamber or a decompression chamber.

- GS compartments
  - . test chambers
  - . . pressure chambers
  - . . . **hyperbaric chambers**
- RT ∞ chambers
  - high pressure
  - vacuum chambers

### hyperbolas

DEF Open curves with two branches, all points of which have a constant difference in distance from two fixed points called foci.

- GS geometry
  - . Euclidean geometry
  - . . analytic geometry
  - . . . conics
  - . . . . **hyperbolas**
- RT hyperbolic trajectories

### hyperbolic coordinates

- UF *hyperbolic space*
- GS coordinates
  - . **hyperbolic coordinates**

### hyperbolic differential equations

- GS analysis (mathematics)
  - . real variables
  - . . differential equations
  - . . . **hyperbolic differential equations**
- RT Dirichlet problem
  - ∞ equations
  - essentially non-oscillatory schemes
  - wave equations

### hyperbolic functions

- GS analysis (mathematics)
  - . complex variables
  - . . **hyperbolic functions**
  - . . real variables
  - . . . **hyperbolic functions**
- functions (mathematics)
  - . **hyperbolic functions**
- RT exponential functions
  - ∞ hyperbolic systems
  - method of characteristics
  - orthogonal functions
  - Riemann waves
  - Riesz theorem

### hyperbolic navigation

DEF Radio navigation in which a hyperbolic line of position is established by signals received from two stations at a constant time difference.

- GS navigation
  - . radio navigation
  - . . **hyperbolic navigation**
  - . . . Decca navigation
  - . . . LORAC navigation system
  - . . . . loran
  - . . . . . loran C
  - . . . . . loran D
  - . . . . . Shoran

- RT air navigation
  - ∞ hyperbolic systems
  - inertial navigation
  - surface navigation

### hyperbolic reentry

- GS atmospheric entry
  - . reentry
  - . . **hyperbolic reentry**
- RT reentry trajectories

### hyperbolic space

USE **hyperbolic coordinates**

### ∞ hyperbolic systems

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT hyperbolic functions
  - hyperbolic navigation
- ∞ systems

### hyperbolic trajectories

- GS trajectories
  - . **hyperbolic trajectories**
- RT celestial mechanics
  - escape velocity
  - hyperbolas
  - spacecraft trajectories

### hyperbranched polymers

(added October 2000)

USE **dendrimers**

### hypercapnia

- GS carbon dioxide tension
  - . **hypercapnia**
- RT blood
  - ∞ breathing
  - respiratory rate
  - respiratory system

### hypercube multiprocessors

DEF Distributed-memory, message-passing multiprocessors designed to reduce the number of interconnections compared to the number of processors. Other simple geometries such as rings, meshes, or trees of processors can be embedded in hypercubes.

- GS data processing equipment
  - . computers
  - . . **hypercube multiprocessors**
- RT architecture (computers)
  - interprocessor communication
  - multiprocessing (computers)
  - parallel computers
  - parallel processing (computers)
  - sorting algorithms
  - supercomputers

### hyperfine structure

- RT atomic structure
  - fine structure
  - line spectra
  - muon spin rotation
  - spectrum analysis
- ∞ structures

### hypergeometric functions

- UF *Jacobi polynomials*
- GS analysis (mathematics)
  - . complex variables
  - . . **hypergeometric functions**
  - . . functions (mathematics)
  - . . **hypergeometric functions**
- RT Bessel functions
  - geometry
  - hyperspaces

### hypergeometry

USE **hyperspaces**

### hyperglycemia

- GS metabolism
  - . carbohydrate metabolism
  - . . **hyperglycemia**

### hypergolic rocket propellants

- GS propellants
  - . rocket propellants
  - . . liquid rocket propellants

... **hypergolic rocket propellants**  
 RT cryogenic rocket propellants  
 gelled rocket propellants  
 hybrid propellants  
 hydrocarbon fuels  
 monomethylhydrazines  
 pyrophoric materials  
 solid propellant ignition  
 spontaneous combustion  
 storable propellants

*hypergravity*

(added June 2001)

USE **high gravity environments****Hyperion**

DEF One of the natural satellites of Saturn orbiting at a mean distance of 1,481,000 kilometers.

GS celestial bodies  
 . natural satellites  
 . . icy satellites  
 . . . **Hyperion**  
 . . Saturn satellites  
 . . . **Hyperion**  
 RT Saturn (planet)

**hyperkinesia**

DEF Excessive exercise, that is often accompanied by uncontrollable muscular movement.

GS physical exercise  
 . **hyperkinesia**  
 RT exhaustion  
 fatigue (biology)  
 hypokinesia  
 stress (physiology)  
 work capacity

*hypermedia*USE **multimedia****hypernea**

RT mental performance

**hypernuclei**

GS particles  
 . charged particles  
 . . energetic particles  
 . . . nuclei (nuclear physics)  
 . . . . **hypernuclei**  
 . corpuscular radiation  
 . . energetic particles  
 . . . nuclei (nuclear physics)  
 . . . . **hypernuclei**  
 RT elementary particles  
 radioactive decay

**hyperons**

DEF In the classification of subatomic particles according to mass, the heaviest of such particles. Some large and highly unstable components of cosmic rays are hyperons.

GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . **hyperons**  
 . . . . . xi hyperons  
 . . fermions  
 . . . baryons  
 . . . . **hyperons**  
 . . . . . xi hyperons  
 . . hadrons  
 . . . baryons  
 . . . . **hyperons**  
 . . . . . xi hyperons  
 . . mesons  
 . . . . **hyperons**  
 . . . . . xi hyperons  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . **hyperons**  
 . . . . . xi hyperons  
 RT antiparticles  
 baryon resonance  
 charged particles  
 meson resonance  
 nucleons

strangeness

**hyperopia**

GS acuity  
 . visual acuity  
 . . **hyperopia**  
 defects  
 . **hyperopia**  
 RT eye diseases  
 vision

**hyperoxia**

DEF A condition in which the total oxygen content of the body is increased above that normally existing at sea level. Used for oxygen toxicity.

UF *oxygen toxicity*  
 RT hyperventilation  
 oximetry  
 oxygen consumption  
 toxic diseases  
 toxicity

**hyperplanes**

GS analysis (mathematics)  
 . real variables  
 . . **hyperplanes**  
 RT hyperspaces  
 polytopes  
 set theory

**hyperpnea**RT  $\infty$  breathing  
 respiratory rate**hypersomnia**

GS sleep  
 . **hypersomnia**

**hypersonic aircraft**

GS hypersonic vehicles  
 . **hypersonic aircraft**  
 . . hypersonic gliders  
 . . . X-20 aircraft  
 RT aerospace planes  
 $\infty$  aircraft  
 boostglide vehicles  
 hypersonics  
 jet aircraft  
 $\infty$  low wing aircraft  
 research aircraft  
 supersonic aircraft  
 sweptback tail surfaces  
 sweptback wings  
 trapezoidal tail surfaces

**hypersonic boundary layer**

GS boundary layers  
 . **hypersonic boundary layer**  
 RT laminar boundary layer  
 thermal boundary layer  
 turbulent boundary layer

**hypersonic combustion**

GS combustion  
 . **hypersonic combustion**  
 RT erosive burning  
 fuel combustion

**hypersonic flight**

RT aerodynamics  
 $\infty$  flight  
 hypersonics  
 missiles  
 rocket flight  
 supersonic flight  
 waveriders  
 X-43 vehicle

**hypersonic flow**

DEF In aerodynamics, flow of a fluid over a body at speeds much greater than the speed of sound and in which the shock waves start at a finite distance from the surface of the body.

GS fluid flow  
 . **hypersonic flow**  
 RT aerodynamics  
 Burnett equations  
 cascade wind tunnels  
 compressible flow

flow velocity  
 gas flow  
 hypersonics  
 hypervelocity wind tunnels  
 Lighthill gas model  
 shock tubes  
 shock tunnels  
 shock waves  
 supersonic flow  
 wind tunnels

**hypersonic forces**

GS aerodynamic forces  
 . **hypersonic forces**  
 RT aerodynamic drag  
 hypersonics  
 lift

**hypersonic gliders**

DEF Unpowered vehicles, specifically reentry vehicles, designed to flow at hypersonic speeds.

GS gliders  
 . **hypersonic gliders**  
 . . X-20 aircraft  
 hypersonic vehicles  
 . hypersonic aircraft  
 . . **hypersonic gliders**  
 . . . X-20 aircraft  
 RT aerospace planes  
 $\infty$  aircraft  
 ASSET gliders  
 boostglide vehicles  
 HL-10 reentry vehicle  
 HLD-35 reentry vehicle  
 lifting reentry vehicles  
 paragliders

**hypersonic heat transfer**

GS transmission  
 . heat transmission  
 . . heat transfer  
 . . . aerodynamic heat transfer  
 . . . . **hypersonic heat transfer**  
 RT aerothermodynamics  
 hypersonics  
 supersonic heat transfer

**hypersonic inlets**

GS intake systems  
 . air intakes  
 . . **hypersonic inlets**  
 RT bypass ratio  
 $\infty$  diffusers  
 engine inlets  
 inlet airframe configurations  
 nose inlets  
 side inlets  
 supersonic inlets

**hypersonic nozzles**

RT conical nozzles  
 $\infty$  nozzles  
 rocket nozzles  
 supersonic nozzles  
 transonic nozzles  
 wind tunnel nozzles

**hypersonic reentry**

GS atmospheric entry  
 . reentry  
 . . **hypersonic reentry**  
 . . . uncontrolled reentry (spacecraft)  
 RT aerodynamic heating  
 aerothermodynamics  
 Berenice rocket vehicle  
 boundary layer plasmas  
 entry guidance (STS)  
 reentry effects  
 reentry physics  
 spacecraft reentry

**hypersonic shock**

RT hypersonics  
 Mach cones  
 noise (sound)  
 shock waves

**hypersonic speed**

SN (MACH 5 OR GREATER)

## hypersonic test apparatus

- GS rates (per time)
  - . **hypersonic speed**
- velocity
  - . **hypersonic speed**
- RT high speed
- hypersonics
- ∞ hypervelocity
- supersonic speed

### hypersonic test apparatus

- RT hypersonics
- hypervelocity wind tunnels
- missile ranges
- supersonic test apparatus
- ∞ test equipment

### hypersonic vehicles

- GS **hypersonic vehicles**
  - . hypersonic aircraft
  - . . hypersonic gliders
  - . . . X-20 aircraft
  - . X-30 vehicle
  - . X-37 vehicle
  - . X-43 vehicle
- RT ∞ flight vehicles
- HOPE aerospace plane
- hypersonics
- ∞ insulated structures
- National Aerospace Plane Program
- recoverable spacecraft
- reentry vehicles
- ∞ spacecraft
- test vehicles
- ∞ vehicles
- waveriders
- ∞ winged vehicles

### hypersonic wakes

- GS wakes
  - . **hypersonic wakes**
- RT aircraft wakes
- bow waves
- hypersonics
- shock waves
- supersonic wakes

### hypersonic wind tunnels

- GS test facilities
  - . wind tunnels
  - . . **hypersonic wind tunnels**
  - . . . cascade wind tunnels
  - . . . hotshot wind tunnels
  - . . . plasma jet wind tunnels
  - . . . shock tunnels
- RT blowdown wind tunnels
- combustion wind tunnels
- hypervelocity wind tunnels
- low density wind tunnels
- magnetic pistons
- shock tubes
- subsonic wind tunnels
- supersonic wind tunnels
- transonic wind tunnels

### hypersonics

DEF That branch of aerodynamics that deals with hypersonic flow.

- GS mechanics (physics)
  - . fluid mechanics
  - . . fluid dynamics
  - . . . gas dynamics
  - . . . . aerodynamics
  - . . . . . **hypersonics**
- RT aerothermodynamics
- hypersonic aircraft
- hypersonic flight
- hypersonic flow
- hypersonic forces
- hypersonic heat transfer
- hypersonic shock
- hypersonic speed
- hypersonic test apparatus
- hypersonic vehicles
- hypersonic wakes
- supersonic speed
- supersonics

### hyperspaces

- UF *hypergeometry*
- RT hypergeometric functions

- hyperplanes
- hyperspheres
- phase-space integral
- ∞ space

### hyperspheres

- RT geometry
- hyperspaces
- real variables

### hypertension

- GS drugs
  - . vasoconstrictor drugs
  - . . **hypertension**
  - . . . organic compounds
  - . . . . peptides
  - . . . . . polypeptides
  - . . . . . . **hypertension**
  - . . . . . . . secretions
  - . . . . . . . . endocrine secretions
  - . . . . . . . . . hormones
  - . . . . . . . . . . **hypertension**

### hypertension

- GS pressure
  - . blood pressure
  - . . **hypertension**
- RT myocardial infarction
- tranquilizers

### hypertext

- (added July 1995)
- RT artificial intelligence
- document markup languages
- electronic publishing
- human-computer interface
- information retrieval
- knowledge representation

### hyperthermia

- RT body temperature
- fever
- heat stroke
- skin temperature (biology)
- thermoregulation

### hypertonia

- USE **osmosis**

### hypertrophy

- USE **growth**

### ∞ hypervelocity

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF Extremely high velocity. Applied by physicists to speeds approaching the speed of light, but generally implies speeds of the order of satellite speed and greater.
- RT escape velocity
- hypersonic speed
- orbital velocity
- relativistic velocity

### hypervelocity accelerators

- USE **hypervelocity guns**

### hypervelocity cratering

- USE **hypervelocity projectiles**
- projectile cratering**

### hypervelocity flow

- GS fluid flow
  - . **hypervelocity flow**
- RT flow velocity
- supersonic flow

### hypervelocity guns

- UF *hypervelocity accelerators*
- RT ∞ accelerators
  - ballistics
  - gas guns
- ∞ guns
  - guns (ordnance)
  - railgun accelerators
  - ram accelerators

### hypervelocity impact

- GS impact
  - . **hypervelocity impact**

- RT asteroid collisions
- cometary collisions
- Deep Impact Mission
- hydrodynamic ram effect
- impact melts
- impact velocity
- mechanical shock
- meteorite collisions
- meteoritic damage
- point impact
- projectile cratering
- Tempel 1 comet

### hypervelocity launchers

- GS launchers
  - . **hypervelocity launchers**
- RT gun launchers
- railgun accelerators
- ram accelerators

### hypervelocity projectiles

- UF *hypervelocity cratering*
- GS projectiles
  - . **hypervelocity projectiles**
- RT ∞ bombardment
- Deep Impact Mission
- light gas guns
- meteoroids
- micrometeorites
- projectile cratering
- simulation
- Tempel 1 comet

### hypervelocity wind tunnels

- SN (ABOVE MACH 10)
- GS test facilities
  - . wind tunnels
  - . . **hypervelocity wind tunnels**
  - . . . cascade wind tunnels
  - . . . hotshot wind tunnels
  - . . . plasma jet wind tunnels
  - . . . shock tunnels
- RT blowdown wind tunnels
- combustion wind tunnels
- hypersonic flow
- hypersonic test apparatus
- hypersonic wind tunnels
- low density wind tunnels
- magnetic pistons
- shock tubes
- supersonic wind tunnels

### hyperventilation

- DEF Overbreathing. A respiratory minute volume, or pulmonary ventilation that is greater than normal.
- RT acidosis
- alkalosis
- hyperoxia

### hypervolemia

- RT blood circulation
- blood volume
- circulatory system

### hypnosis

- GS sleep
  - . **hypnosis**
- RT anesthesia
- suggestion

### hypobaric atmospheres

- RT altitude simulation
- altitude tolerance
- ∞ atmospheres
  - high altitude breathing
  - high altitude environments
  - high altitude pressure
  - low pressure
  - vacuum tests

### hypocapnia

- DEF Deficiency of carbon dioxide in the blood and body tissues, which may result in dizziness, confusion, and muscular cramps.
- GS carbon dioxide tension
  - . **hypocapnia**

- RT blood
- hypodermis**  
GS tissues (biology)  
. **hypodermis**
- hypodynamia**  
RT hindlimb suspension  
muscles  
muscular function
- hypoelasticity**  
GS mechanical properties  
. elastic properties  
. . **hypoelasticity**
- hypoglycemia**  
GS metabolism  
. carbohydrate metabolism  
. . **hypoglycemia**
- hypogravity*  
(added June 2001)  
USE **microgravity**
- hypokinesia**  
RT glucocorticoids  
head down tilt  
hindlimb suspension  
hyperkinesia  
muscular function  
musculoskeletal system  
physical exercise
- hypometabolism**  
GS metabolism  
. **hypometabolism**  
RT thyroid gland
- hypophysis*  
USE **pituitary gland**
- hypotension**  
GS pressure  
. blood pressure  
. . **hypotension**  
RT hemorrhages
- hypothalamus**  
GS anatomy  
. glands (anatomy)  
. . endocrine glands  
. . . **hypothalamus**  
. nervous system  
. . central nervous system  
. . . brain  
. . . . diencephalon  
. . . . . **hypothalamus**  
RT pituitary gland
- hypothermia**  
RT body temperature  
skin temperature (biology)  
thermoregulation
- hypotheses**  
GS **hypotheses**
- . expectancy hypothesis  
. intermittency hypothesis  
. Lagrange similarity hypothesis  
. null hypothesis  
. vorticity transport hypothesis
- RT assumptions  
inference  
mathematical logic  
quality control  
theorems  
∞ theories  
theses
- hypothetical particles**  
(added November 1999)  
GS particles  
. elementary particles  
. . **hypothetical particles**  
. . . gluons  
. . . gravitinos  
. . . gravitons  
. . . partons  
. . . quarks  
. . . tachyons  
. . . weakly interacting massive particles
- hypothetical planets**  
(added June 1998)  
UF *Phaethon (hypothetical planet)*  
*planet X*  
*rogue planets*  
*transplutonic planets*  
GS celestial bodies  
. planets  
. . **hypothetical planets**  
RT comets  
extrasolar planets  
planetary orbits
- hypotonia**  
GS muscular tonus  
. **hypotonia**  
RT muscular function
- hypoventilation**  
DEF A respiratory minute volume, or pulmonary ventilation that is less than normal. Also called underbreathing.  
GS rates (per time)  
. respiratory rate  
. . **hypoventilation**
- hypovolemia**  
RT blood circulation  
blood volume
- hypoxemia**  
DEF The condition of reduction of the normal oxygen tension in the blood.  
GS pressure  
. partial pressure  
. . oxygen tension  
. . . **hypoxemia**
- RT hypoxia
- hypoxia**  
DEF Oxygen want or deficiency; any state wherein a physiologically inadequate amount of oxygen is available to, or utilized by, tissue without respect to cause or degree. Used for oxygen deficiency.  
UF *oxygen deficiency*  
RT anoxia  
fasting  
hypoxemia  
necrosis  
oximetry  
oxygen consumption  
stress (physiology)
- hypsoigraphy**  
GS geography  
. **hypsoigraphy**  
RT contours  
datum (elevation)  
elevation  
mapping  
maps  
relief maps  
topography
- hypsoimeters**  
GS measuring instruments  
. **hypsoimeters**  
RT altimeters  
barometers  
meteorological instruments  
pressure gages
- hysteresis**  
DEF Any of several effects resembling a kind of internal friction, accompanied by the generation of heat within the substance affected. The delay of an indicator in registering a change in a parameter being measured.  
RT accuracy  
antiferroelectricity  
antiferromagnetism  
damping  
dynamic characteristics  
eddy currents  
electrical properties  
errors  
internal friction  
magnetic permeability  
magnetic properties  
mechanical properties  
optical bistability  
∞ physical properties  
precision  
retarding  
shear properties  
tensile strength  
time lag  
tolerances (mechanics)  
viscoelasticity  
viscoplasticity
- HYTIME*  
USE **document markup languages**



**I beams**

- GS structural members
  - . beams (supports)
    - . . **I beams**
- RT cantilever beams
  - . curved beams
  - . trusses

**I2S cameras**

- GS optical equipment
  - . cameras
    - . . **I2S cameras**
  - . photographic equipment
    - . cameras
      - . . **I2S cameras**
- RT aircraft instruments
  - . multispectral photography
  - . spacecraft instruments

**Iapetus**

- DEF A satellite of Saturn orbiting at a mean distance of 3,562,000 kilometers.
- GS celestial bodies
  - . natural satellites
    - . . icy satellites
      - . . . **Iapetus**
    - . . Saturn satellites
      - . . . **Iapetus**
- RT Charon
  - . Saturn (planet)

**IBM 360 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 360 computer**
    - . . IBM computers
      - . . . **IBM 360 computer**

**IBM 370 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 370 computer**
    - . . IBM computers
      - . . . **IBM 370 computer**

**IBM 650 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 650 computer**
    - . . IBM computers
      - . . . **IBM 650 computer**

**IBM 704 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 704 computer**
    - . . IBM computers
      - . . . **IBM 704 computer**

**IBM 709 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 709 computer**
    - . . IBM computers
      - . . . **IBM 709 computer**

**IBM 1130 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 1130 computer**
    - . . IBM computers
      - . . . **IBM 1130 computer**

**IBM 1401 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 1401 computer**
    - . . IBM computers
      - . . . **IBM 1401 computer**

**IBM 1410 computer**

- GS data processing equipment

- . computers
  - . . digital computers
    - . . . **IBM 1410 computer**
  - . . IBM computers
    - . . . **IBM 1410 computer**

**IBM 1620 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 1620 computer**
    - . . IBM computers
      - . . . **IBM 1620 computer**

**IBM 2250 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 2250 computer**
    - . . IBM computers
      - . . . **IBM 2250 computer**

**IBM 7030 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7030 computer**
    - . . IBM computers
      - . . . **IBM 7030 computer**

**IBM 7040 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7040 computer**
    - . . IBM computers
      - . . . **IBM 7040 computer**

**IBM 7044 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7044 computer**
    - . . IBM computers
      - . . . **IBM 7044 computer**

**IBM 7070 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7070 computer**
    - . . IBM computers
      - . . . **IBM 7070 computer**

**IBM 7074 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7074 computer**
    - . . IBM computers
      - . . . **IBM 7074 computer**

**IBM 7090 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7090 computer**
    - . . IBM computers
      - . . . **IBM 7090 computer**

**IBM 7094 computer**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . **IBM 7094 computer**
    - . . IBM computers
      - . . . **IBM 7094 computer**

**IBM computers**

- GS data processing equipment
  - . computers
    - . . **IBM computers**
      - . . . IBM 360 computer
      - . . . IBM 370 computer
      - . . . IBM 650 computer
      - . . . IBM 704 computer
      - . . . IBM 709 computer
      - . . . IBM 1130 computer
      - . . . IBM 1401 computer

- . . . IBM 1410 computer
  - . . . IBM 1620 computer
  - . . . IBM 2250 computer
  - . . . IBM 7030 computer
  - . . . IBM 7040 computer
  - . . . IBM 7044 computer
  - . . . IBM 7070 computer
  - . . . IBM 7074 computer
  - . . . IBM 7090 computer
  - . . . IBM 7094 computer
  - . . . IBM personal computers
- RT digital computers

**IBM PC**

- USE **IBM personal computers**

**IBM personal computers**

(added September 1992)

SN (INCLUDES IBM COMPATIBLE PERSONAL COMPUTERS)

UF **IBM PC**

- GS data processing equipment
  - . computers
    - . . digital computers
      - . . . microcomputers
      - . . . personal computers
        - . . . . **IBM personal computers**
    - . . IBM computers
      - . . . **IBM personal computers**

- RT computer graphics
  - . computer programs

**Icarus asteroid**

- GS celestial bodies
  - . asteroids
    - . . **Icarus asteroid**
- RT asteroid belts

**ICBM (missiles)**

- USE **intercontinental ballistic missiles**

**ice**

DEF Water in the solid state; specifically, the dense substance formed in nature by the freezing of liquid water, by the condensation of water vapor directly into ice crystals, or by the recrystallization or compaction of fallen snow. It is colorless to pale blue or greenish blue, usually white from included gas bubbles. At standard atmospheric pressure, it is formed at and has a melting point of 0 deg. C; in freezing it expands about one eleventh in volume. Ice commonly occurs as hexagonal crystals, and in large masses is classed as a rock. The term is often substituted for glacier; as in "continental ice."

**GS ice**

- . bay ice
  - . glaciers
  - . lake ice
  - . . ice floes
  - . land ice
  - . sea ice
    - . . ice floes
    - . . icebergs
    - . . pressure ice
- RT auferis (ice)
    - . cirques (landforms)
    - . frost
    - . ice clouds
    - . polar caps
    - . refrigerants
    - . runway conditions
    - . slush
    - . storms (meteorology)
    - . water

**ice clearings**

(added July 2001)

- USE **polynyas**

**ice clouds**

(added March 1989)

GS clouds (meteorology)

. **ice clouds**

- RT cloud glaciation
  - . ∞ clouds
  - . ice

stratosphere

**ice environments**  
 UF *Antarctic environment*  
*Arctic environments*  
 GS environments  
 . **ice environments**  
 RT Earth cryosphere  
 environment effects  
 marine environments  
 planetary cryospheres  
 sea ice

**ice floes**  
 DEF Large fragments or extensive sheets of ice, detached and floating freely in open water.  
 GS ice  
 . lake ice  
 . . **ice floes**  
 . sea ice  
 . . **ice floes**  
 RT oceanography

**ice formation**  
 UF *icing*  
 GS **ice formation**  
 . aircraft icing  
 . cloud glaciation  
 RT bay ice  
 fouling  
 freezing  
 graupel  
 hail  
 lake ice  
 low temperature  
 pressure ice  
 sea ice  
 snow

**ice mapping**  
 GS mapping  
 . **ice mapping**  
 RT aerial photography  
 bay ice  
 Earth resources  
 hydrography  
 hydrology  
 infrared photography  
 oceanography  
 photogeology  
 photography  
 photomapping  
 sea ice  
 space surveillance (spaceborne)  
 surveillance

**ice nuclei**  
 RT Aitken nuclei  
 cloud glaciation  
 condensation nuclei  
 freezing  
 graupel  
 hydrometeors  
 nucleation  
 ∞ nuclei

*ice observation*  
 USE **ice reporting**

*ice packs*  
 USE **sea ice**

**ice prevention**  
 GS prevention  
 . **ice prevention**  
 RT aircraft icing  
 antiicing additives  
 defrosting  
 deicers  
 deicing  
 heat tapes  
 heating  
 melting  
 storm suppression

**ice reporting**  
 UF *ice observation*  
 RT bay ice  
 icebergs  
 meteorological flight

polar meteorology  
 space surveillance (spaceborne)  
 surveillance

*ice shelves*  
 USE **land ice**

**Ice, Cloud and Land Elevation Satellite**  
*(added December 2002)*  
 DEF Earth Observing System satellite and mission designed to measure Earth's ice sheet mass balance, cloud and aerosol heights, as well as land topography and vegetation characteristics.  
 UF *ICESat*  
 GS artificial satellites  
 . scientific satellites  
 . . **Ice, Cloud and Land Elevation Satellite**  
 RT Earth Observing System (EOS)  
 laser altimeters  
 satellite altimetry

**icebergs**  
 DEF Large, massive pieces of floating or stranded glacier ice of any shape, detached (calved) from the front of glaciers into a body of water. Icebergs extend more than 5 m above sea level and have the greater part of their masses (4/5 to 8/9) below sea level. They may reach a length of more than 80 km.  
 GS ice  
 . sea ice  
 . . **icebergs**  
 resources  
 . Earth resources  
 . . **icebergs**  
 RT ice reporting  
 land ice

**Iceland**  
 GS landforms  
 . islands  
 . . **Iceland**  
 nations  
 . **Iceland**  
 RT Europe  
 Icelandic space program

**Icelandic space program**  
*(added August 1990)*  
 GS programs  
 . space programs  
 . . European space programs  
 . . . **Icelandic space program**  
 RT Iceland

*ICESat*  
*(added December 2002)*  
 USE **Ice, Cloud and Land Elevation Satellite**

**ichthyology**  
 RT fishes  
 schools (fish)

*icing*  
 USE **ice formation**

**ICL computers**  
 DEF Family of British digital computers produced by International Computers, Ltd. Used for International Computers Limited.  
 UF *International Computers Limited*  
 GS data processing equipment  
 . computers  
 . . digital computers  
 . . . **ICL computers**  
 RT European Space Agency

**icosahedrons**  
 GS geometry  
 . Euclidean geometry  
 . . polyhedrons

. . . **icosahedrons**

*ICP-MS (spectrometry)*  
*(added March 2001)*  
 USE **inductively coupled plasma mass spectrometry**

**icy satellites**  
 GS celestial bodies  
 . natural satellites  
 . . **icy satellites**  
 . . . Ariel  
 . . . Callisto  
 . . . Dione  
 . . . Enceladus  
 . . . Europa  
 . . . Ganymede  
 . . . Hyperion  
 . . . Iapetus  
 . . . Mimas  
 . . . Rhea (astronomy)  
 . . . Tethys  
 . . . Titania  
 RT extraterrestrial water  
 Galilean satellites  
 Jupiter satellites  
 satellite surfaces  
 Saturn satellites

**Ida asteroid**  
*(added December 1995)*  
 GS celestial bodies  
 . asteroids  
 . . **Ida asteroid**  
 RT asteroid belts  
 Galileo spacecraft  
 meteoroids

**Idaho**  
 GS nations  
 . United States  
 . . **Idaho**  
 RT Columbia River Basin (ID-OR-WA)  
 Yellowstone National Park  
 (ID-MT-WY)

**ideal fluids**  
 RT compressible fluids  
 equations of state  
 ∞ fluids  
 incompressible fluids  
 Mollier diagram

**ideal gas**  
 DEF A gas which conforms to Boyle's law and has zero heat of free expansion (or also obeys Charles' law). Used for perfect gas.  
 UF *perfect gas*  
 GS gases  
 . **ideal gas**  
 RT Bose-Einstein condensates  
 Dalton law  
 equations of state  
 gas density  
 kinetic theory  
 kinetics  
 real gases

*identify friend or foe*  
 USE **IFF systems (identification)**

**identifying**  
 GS **identifying**  
 . crop identification  
 . IFF systems (identification)  
 . parameter identification  
 . rapid ballistics identification  
 . system identification  
 . timber identification  
 RT chemical analysis  
 coding  
 cognition  
 detection  
 gas detectors  
 inspection  
 marking  
 ∞ measurement  
 missile detection  
 particulate sampling  
 perception

## identities

recognition  
spectral signatures  
tracking (position)  
ultrasonic flaw detection  
Wiswesser notations

### identities

RT congruences  
∞ equations

### IDEF (data exchange)

USE **interservice data exchange program**

### idlers

RT bearings  
gears  
pulleys  
rollers  
vehicular tracks

### IFF systems (identification)

UF *identify friend or foe*

GS identifying

. **IFF systems (identification)**

RT aircraft detection  
cognition  
interrogation  
recognition  
∞ systems

### IFR (rules)

USE **instrument flight rules**

### IGFET

USE **field effect transistors**

### igneous rocks

DEF Rocks or minerals that solidify from molten or partly molten material, i.e., from magma. The term is also applied to processes leading to, related to, or resulting from the formation of such rocks. Igneous rocks constitute one of the three main classes into which rocks are divided, the others being metamorphic rocks and sedimentary rocks.

UF *ignimbrite*

GS rocks

. **igneous rocks**

. . anorthosite  
. . basalt  
. . diorite  
. . dunite  
. . eclogite  
. . feldspar  
. . gabbro  
. . granite  
. . obsidian  
. . . moldavite  
. . peridotite  
. . pumice  
. . rhyolite  
. . syenite  
. . trachyte

RT andesite  
batholiths  
breccia  
effusives  
enstatite  
feldspars  
ilmenite  
lava  
magma  
mica  
minerals  
olivine  
petrogenesis  
pyroxenes  
quartz  
regolith  
rock intrusions  
sedimentary rocks  
soils  
spinel

tourmaline

### ignimbrite

USE **igneous rocks**

### igniters

DEF Devices used to begin combustion, such as a spark plug in a combustion chamber of a jet engine, or a squib used to ignite the fuel in a rocket.

GS **igniters**

. initiators (explosives)  
. . boosters (explosives)  
. . caps (explosives)  
. . detonators  
. . exploding wires  
. . primers (explosives)  
. squibs

RT

ammunition  
electric ignition  
explosive devices  
ignition  
ignition systems  
incendiary ammunition  
pyrophoric materials  
solid propellant ignition  
spark plugs

### ignition

DEF The initiation of combustion. Used for reignition.

UF *reignition*

GS **ignition**

. electric ignition  
. solid propellant ignition  
. spark ignition

RT

combustion  
combustion physics  
firing (igniting)  
flame propagation  
flammability  
flash point  
fuel combustion  
igniters  
premixing  
propellant combustion  
roasting  
sparks  
spontaneous combustion  
starting

### ignition limits

RT combustion  
flame retardants  
flammability  
fuel-air ratio  
gas mixtures  
∞ limits

### ignition systems

RT automobiles  
distributors  
dwell  
electric coils  
electric ignition  
engines  
igniters  
internal combustion engines  
rocket engines  
spark plugs  
squibs  
starters  
∞ systems

### ignition temperature

GS temperature  
. **ignition temperature**  
. . flash point

RT

combustion temperature  
flammability  
propellant sensitivity  
pyrophoric materials  
solid propellant ignition  
spontaneous combustion  
thermites

### ignitrons

GS electron tubes  
. gas discharge tubes  
. . **ignitrons**

rectifiers  
. **ignitrons**

### IGOSS

USE **integrated global ocean station systems**

### IGY (geophysical year)

USE **International Geophysical Year**

### IHD (hydrological decade)

USE **International Hydrological Decade**

### IIR filters

(added December 2002)

DEF Digital filters that use previous output values in the calculation of current output values, providing an impulse response that is theoretically infinite.

UF *infinite impulse response filters*

*recursive filters*

GS electromagnetic wave filters

. electric filters

. . digital filters

. . . **IIR filters**

RT

adaptive filters  
autoregressive moving average  
FIR filters  
recursive functions

### IL-14 aircraft

UF *Ilyushin IL-14 aircraft*

GS Ilyushin aircraft

. **IL-14 aircraft**

monoplanes

. **IL-14 aircraft**

transport aircraft

. **IL-14 aircraft**

RT ∞ aircraft

### IL-62 aircraft

UF *Classic aircraft*

*Ilyushin IL-62 aircraft*

GS commercial aircraft

. **IL-62 aircraft**

Ilyushin aircraft

. **IL-62 aircraft**

jet aircraft

. turbofan aircraft

. . **IL-62 aircraft**

monoplanes

. **IL-62 aircraft**

passenger aircraft

. **IL-62 aircraft**

RT ∞ aircraft

### IL-76 aircraft

(added September 1994)

GS Ilyushin aircraft

. **IL-76 aircraft**

jet aircraft

. **IL-76 aircraft**

passenger aircraft

. **IL-76 aircraft**

transport aircraft

. **IL-76 aircraft**

RT ∞ aircraft

### IL-86 aircraft

(added September 1994)

GS Ilyushin aircraft

. **IL-86 aircraft**

jet aircraft

. **IL-86 aircraft**

passenger aircraft

. **IL-86 aircraft**

transport aircraft

. **IL-86 aircraft**

RT ∞ aircraft

### IL-96 aircraft

(added September 1994)

GS Ilyushin aircraft

. **IL-96 aircraft**

jet aircraft

. **IL-96 aircraft**

passenger aircraft

. **IL-96 aircraft**

transport aircraft

. **IL-96 aircraft**

RT ∞ aircraft

### ill-conditioned problems (mathematics)

(added March 1994)

DEF In numerical analysis, problems (algorithms) in which a small error in the data or small errors introduced by rounding, truncation, or other computational procedures result in much larger errors in the solution. (See also ILL-POSED PROBLEMS)

RT computation  
differential equations  
error analysis  
ill-posed problems (mathematics)  
integral equations  
numerical analysis  
numerical stability  
problem solving  
truncation errors  
uniqueness

### Illiac 3 computer

GS data processing equipment  
. computers  
. . . digital computers  
. . . . Iliac computers  
. . . . **Iliac 3 computer**  
RT analog to digital converters  
parallel processing (computers)

### Illiac 4 computer

GS data processing equipment  
. computers  
. . . digital computers  
. . . . Iliac computers  
. . . . **Iliac 4 computer**  
RT analog to digital converters  
parallel processing (computers)

### Iliac computers

GS data processing equipment  
. computers  
. . . digital computers  
. . . . **Iliac computers**  
. . . . Iliac 3 computer  
. . . . Iliac 4 computer

### Illinois

GS nations  
. United States  
. . **Illinois**  
RT Ohio River (US)  
Wabash River Basin (IL-IN-OH)

### illite

GS clays  
. **illite**  
minerals  
. **illite**  
RT soils

### ill-posed problems (mathematics)

(added March 1994)

DEF Problems corresponding to physical system models whose solutions do not satisfy Hadamard's criteria for 'well posedness,' i.e., existence, uniqueness, and continuous dependence on initial data. Most commonly, such problems stem fundamental physical limitations on the accessibility of information about the object or process being studied. (See also ILL-CONDITIONED PROBLEMS)

UF *improperly-posed problems (mathematics)*

RT boundary value problems  
differential equations  
Fredholm equations  
ill-conditioned problems (mathematics)  
integral equations  
iterative solution  
numerical analysis  
numerical stability  
problem solving  
uniqueness

### illumination

SN (LIMITED TO DETECTION RATE PER UNIT AREA OF VISIBLE RADIATION--EQUALS LIGHT PRESSURE TIMES SPEED OF LIGHT)

DEF The total luminous flux received on a unit area of a given real or imaginary surface, expressed in such units as the footcandle, lux, or phot. Illuminance is analogous to irradiance, but is to be distinguished from the latter in that illuminance refers only to light and contains the luminous efficiency weighting factor necessitated by the nonlinear wavelength response of the human eye. Used for light pressure.

UF *light pressure*

GS pressure  
. radiation pressure  
. . luminous intensity  
. . . **illumination**  
rates (per time)  
. flux density  
. . radiant flux density  
. . . irradiance  
. . . . **illumination**  
. . . luminous intensity  
. . . . **illumination**

RT brightness  
illuminating  
∞ illumination  
light (visible radiation)  
luminance  
luminosity  
radiancy  
solar constant  
solar flux density  
visibility

### illuminating

UF *lighting*  
RT architecture  
brightness  
comfort  
darkness  
environmental engineering  
∞ flares  
glare  
human factors engineering  
illumination  
∞ illumination  
light sources  
light transmission  
lighting equipment  
luminaires  
luminance  
photometry  
∞ projection  
projectors  
pyrotechnics  
shadows

### ∞ illumination

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT brightness discrimination  
darkening  
darkness  
∞ diffusers  
illumination  
illuminating  
illuminators  
isophotes  
light transmission  
luminescence  
photometry

### illuminators

GS light sources  
. **illuminators**  
lighting equipment  
. **illuminators**  
RT ∞ illumination  
incandescence  
luminescence

### illusions

GS psychological effects  
. **illusions**  
. . hallucinations  
. . moon illusion  
. . oculogravic illusions  
. . optical illusion  
. . . elevator illusion  
RT afterimages  
images

perception  
vision

### ilmenite

DEF A mineral having the theoretical composition FeO.TiO<sub>2</sub> used principally in the production of titanium oxide.

GS chalcogenides  
. oxides  
. . metal oxides  
. . . iron oxides  
. . . . **ilmenite**  
. . . titanium oxides  
. . . . **ilmenite**  
iron compounds  
. iron oxides  
. . **ilmenite**  
minerals  
. **ilmenite**  
titanium compounds  
. titanates  
. . **ilmenite**  
. titanium oxides  
. . **ilmenite**  
RT igneous rocks  
sands

ILS (*landing systems*)

USE **instrument landing systems**

### Ilyushin aircraft

GS **Ilyushin aircraft**  
. IL-14 aircraft  
. IL-62 aircraft  
. IL-76 aircraft  
. IL-86 aircraft  
. IL-96 aircraft  
RT ∞ aircraft

*Ilyushin IL-14 aircraft*

USE **IL-14 aircraft**

*Ilyushin IL-62 aircraft*

USE **IL-62 aircraft**

### image analysis

DEF Technique for understanding or quantification of digital data as presented in a two dimensional format.

GS **image analysis**  
. image classification  
. spectral mixture analysis  
RT cluster analysis  
edge detection  
Gabor filters  
image enhancement  
image processing  
image resolution  
optical flow (image analysis)  
pattern recognition  
radar imagery  
remote sensing  
satellite imagery  
scene analysis  
Voronoi diagrams

### image classification

(added July 1993)

DEF The sorting of remotely sensed image data by any one or more of a variety of means.

GS image analysis  
. **image classification**  
RT atmospheric correction  
change detection  
classifications  
∞ classifying  
image correlators  
image enhancement  
image processing  
imaging techniques  
normalized difference vegetation index  
optical data processing  
pattern recognition  
remote sensing  
remote sensors

### image contrast

GS contrast  
. **image contrast**

## image converters

RT focusing  
gray scale  
pattern registration  
resolution  
self focusing  
signal to noise ratios  
smear  
visibility

### image converters

DEF Optoelectronic devices capable of changing the spectral characteristics of a radiant image. Examples of such changes are infrared to visible and x ray to visible.

GS optical equipment  
. **image converters**  
. . . telescopes  
. . . image tubes  
. . . thermicons

RT camera tubes  
 $\infty$  converters  
Lallemand cameras  
light amplifiers  
microchannels  
photocathodes

### image correlators

UF *SIMICOR (image correlator)*  
*simultaneous image correlator*

GS correlators  
. **image correlators**  
RT holography  
image classification  
imaging techniques  
map matching guidance  
optical correlators  
pattern registration  
speckle holography  
video landmark acquisition and tracking

### image dissector tubes

GS electron tubes  
. camera tubes  
. . **image dissector tubes**  
television equipment  
. **image dissector tubes**  
RT guidance sensors  
satellite orientation

### image enhancement

RT band ratioing  
focusing  
geometric rectification (imagery)  
gray scale  
image analysis  
image classification  
images  
imaging techniques  
light amplifiers  
radiometric correction  
resolution  
signal to noise ratios  
tomography  
vegetative index

### image filters

GS **image filters**  
. Gabor filters  
RT  $\infty$  filters  
imaging techniques

### image furnaces

GS heating equipment  
. furnaces  
. . **image furnaces**  
laboratory equipment  
. **image furnaces**  
RT arc heating  
carbon arcs

### image intensifiers

UF *intensifier tubes*  
GS intensifiers  
. **image intensifiers**  
. . image orthicons  
RT amplifiers  
imaging techniques  
Lallemand cameras  
light amplifiers

night vision  
orthicons  
phosphors  
photocathodes

### image motion compensation

RT aerial photography  
 $\infty$  compensation  
imaging techniques  
pattern registration  
video compression

### image orthicons

GS electron tubes  
. camera tubes  
. . orthicons  
. . . **image orthicons**  
intensifiers  
. image intensifiers  
. . **image orthicons**  
RT photocathodes

### image processing

DEF Conversion of optical images into digital data form for storage and reconstruction by computer techniques.

GS **image processing**  
. band ratioing  
. geometric rectification (imagery)  
RT atmospheric correction  
change detection  
cluster analysis  
computer aided tomography  
data processing  
data products  
discrete cosine transform  
edge detection  
Feature Identification and Location  
Exper  
frames (data processing)  
Gabor filters  
Gabor transformation  
geometric accuracy  
gray scale  
image analysis  
image classification  
imagery  
imaging techniques  
laser guide stars  
multisensor applications  
nap-of-the-earth navigation  
onboard data processing  
optical data processing  
optical flow (image analysis)  
point spread functions  
preprocessing  
principal components analysis  
 $\infty$  processing  
pushbroom sensor modes  
raster scanning  
scientific visualization  
spatial resolution  
spectral mixture analysis  
vector quantization  
video compression  
wavelet analysis

### image reconstruction

DEF The reproduction of the original scene from data stored or transmitted after scanning by an electron beam. In reprography, the re-creation of graphic images from digital data stored in a computer.

GS reconstruction  
. **image reconstruction**  
RT display devices  
holography  
imaging techniques  
pattern registration  
scene generation

### image resolution

DEF In optics, a measure of the ability of an optical instrument to produce separable images of different points on an object.

GS resolution  
. **image resolution**  
RT anisoplanatism  
electro-optical photography  
geometric accuracy

high definition television  
image analysis  
imagery  
matching  
multispectral photography  
pattern registration  
spatial resolution

### image rotation

DEF Mechanized or digital rotation of an image.  
GS gyration  
. rotation  
. . **image rotation**  
RT imaging techniques

### IMAGE satellite

(added November 2000)

DEF A medium class Explorer (MIDEX) mission to study the global response of the Earth's magnetosphere to changes in the solar wind. IMAGE (Imager for Magnetopause-to-Aurora Global Exploration) will use neutral atom, ultraviolet, and radio imaging techniques to: (a) identify the dominant mechanisms for injecting plasma into the magnetosphere on substorm and magnetic storm time scales; (b) determine the directly driven response of the magnetosphere to solar wind changes; and, (c) discover how and where magnetospheric plasmas are energized, transported, and subsequently lost during substorms and magnetic storms.

UF *Explorer 78 satellite*  
*Imager for Magnetopause-to-Aurora Global Explorer*

GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . **IMAGE satellite**  
RT auroral zones  
Earth magnetosphere  
magnetic storms  
magnetopause  
plasmaphere  
space plasmas

### image transducers

GS transducers  
. **image transducers**  
RT camera tubes  
imaging techniques  
Lallemand cameras

### image tubes

DEF Electron tubes that reproduce on their fluorescent screens images of irradiation patterns incident on their photosensitive surfaces.

GS electron tubes  
. **image tubes**  
. . thermicons  
optical equipment  
. image converters  
. . **image tubes**  
. . . thermicons  
RT cathode ray tubes  
display devices  
flying spot scanners  
head-up displays  
monoscopes

### image velocity sensors

RT images  
imaging techniques  
 $\infty$  sensors

*Imager for Magnetopause-to-Aurora Global Explorer*

(added December 2000)

USE **IMAGE satellite**

### imagery

GS **imagery**  
. kinoform  
. microwave imagery  
. photography  
. . aerial photography  
. . all sky photography  
. . astronomical photography  
. . autoradiography  
. . black and white photography

- . . chronophotography
  - . . cinematography
  - . . cloud photography
  - . . color photography
  - . . electron photography
  - . . electro-optical photography
  - . . fractography
  - . . frame photography
  - . . high speed photography
  - . . holography
    - . . . acoustical holography
    - . . . microwave holography
    - . . . speckle holography
    - . . . white light holography
  - . . infrared imagery
  - . . lunar photography
  - . . metric photography
  - . . microwave photography
  - . . multispectral photography
    - . . . infrared photography
    - . . . . color infrared photography
  - . . . radar photography
  - . . orthophotography
  - . . photomicrography
  - . . rocket-borne photography
  - . . shadowgraph photography
  - . . Schlieren photography
  - . . spaceborne photography
    - . . . satellite-borne photography
  - . . spectrophotography
  - . . stereoscopy
  - . . stereophotography
  - . . streak photography
  - . . ultraviolet photography
  - . . ultraviolet photometry
  - . . underwater photography
  - . . urography
    - . . radar imagery
    - . . radiography
    - . . angiography
    - . . autoradiography
    - . . neutron radiography
    - . . tomography
    - . . . computer aided tomography
  - . . urography
  - . . reproduction (copying)
  - . . xerography
  - . . satellite imagery
  - . . spectroheliographs
  - . . ultraviolet imagery
  - . . x ray imagery
    - . . ultraviolet photography
  - RT acousto-optics
  - appearance
  - Atmospheric & Oceanographic Inform Sys
  - change detection
  - contour sensors
  - display devices
  - Earth resources
  - geographic information systems
  - geometric rectification (imagery)
  - graphic arts
  - ground truth
  - holographic optical elements
  - image processing
  - image resolution
  - microwave sounding
  - multispectral radar
  - radar signatures
  - scene analysis
  - sea truth
  - signature analysis
- images**
- UF *optical images*
  - GS **images**
    - . afterimages
    - . retinal images
  - RT contour sensors
  - display devices
  - evaporography
  - halos
  - helmet mounted displays
  - illusions
  - image enhancement
  - image velocity sensors
  - ∞ optics
  - perception
- photographs
  - raster scanning
  - representations
  - spatial filtering
  - vision
- imaging radar**
- GS radar
    - . **imaging radar**
    - . . Shuttle Imaging Radar
  - RT radar imagery
  - remote sensors
  - side-looking radar
  - synthetic aperture radar
- imaging spectrometers**
- GS measuring instruments
    - . spectrometers
    - . . **imaging spectrometers**
  - RT Envisat-1 satellite
  - imaging techniques
  - remote sensing
  - spectral reflectance
  - spectrophotometry
- imaging techniques**
- GS **imaging techniques**
    - . acoustic imaging
    - . . acoustical holography
    - . raster scanning
    - . scene generation
    - . speckle holography
  - RT acoustic microscopes
  - acoustical holography
  - adaptive optics
  - apodization
  - charge injection devices
  - crop identification
  - flat panel displays
  - gray scale
  - high definition television
  - hologrammetry
  - image classification
  - image correlators
  - image enhancement
  - image filters
  - image intensifiers
  - image motion compensation
  - image processing
  - image reconstruction
  - image rotation
  - image transducers
  - image velocity sensors
  - imaging spectrometers
  - magnetic force microscopy
  - ∞ methodology
  - microwave holography
  - modulation transfer function
  - multimedia
  - multisensor applications
  - multisensor fusion
  - multispectral band scanners
  - multispectral photography
  - multispectral radar
  - optical relay systems
  - optical transfer function
  - ∞ optics
    - . particle image velocimetry
  - pattern registration
  - photography
  - pixels
  - principal components analysis
  - radar imagery
  - rapid ballistics identification
  - resolution cell
  - satellite imagery
  - scene analysis
  - spatial resolution
  - streak photography
  - synthetic apertures
  - television systems
  - ultrasonic scanners
  - vegetative index
  - x ray imagery
- imbeddings**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT encapsulating
- imbeddings (mathematics)
  - invariant imbeddings
  - ∞ matrices
- imbeddings (mathematics)**
- GS geometry
    - . topology
    - . . **imbeddings (mathematics)**
    - . . . invariant imbeddings
  - RT ∞ imbeddings
  - strange attractors
- IMBLMS**
- SN (INTEGRATED MEDICAL AND BEHAVIORAL LABORATORY MEASUREMENT SYSTEM)
  - UF *Integ Med and Behavioral Lab Measur System*
  - RT bioinstrumentation
  - biomedical data
  - measuring instruments
  - medical equipment
- IMCC (control center)*
- USE **integrated mission control center**
- IME satellite*
- USE **International Magnetospheric Explorer**
- imidazoles**
- (added August 2004)
- DEF Part of a group of heterocyclic compounds with a 5-membered diunsaturated ring, containing 2 nitrogen atoms.
  - GS organic compounds
    - . cyclic compounds
    - . . heterocyclic compounds
    - . . . **imidazoles**
- imides**
- GS nitrogen compounds
    - . **imides**
    - . . bismaleimide
    - . . phthalimides
    - . . succinimides
  - RT amides
- imines**
- UF *Schiff bases*
  - GS nitrogen compounds
    - . **imines**
  - RT amines
- IMLSS**
- SN (INTEGRATED MANEUVERING AND LIFE SUPPORT SYSTEM)
  - UF *Integrated Maneuvering Life Support Sys*
  - GS self maneuvering units
    - . **IMLSS**
    - . support systems
    - . life support systems
    - . . portable life support systems
    - . . . **IMLSS**
  - RT astronaut maneuvering equipment
  - extravehicular activity
  - extravehicular mobility units
  - ∞ systems
- immersion*
- USE **submerging**
- immiscibility*
- USE **solubility**
- immittance*
- USE **electrical impedance**
- immobilization**
- GS **immobilization**
    - . hindlimb suspension
  - RT damage
  - impairment
  - ∞ motion
- immune systems**
- GS anatomy
    - . **immune systems**
    - . . lymphatic system
    - . . . spleen
    - . . . thymus gland

## immunity

RT acquired immunodeficiency syndrome  
antibodies  
antigens  
human immunodeficiency virus  
immunity  
immunoassay  
immunology  
immunosuppression  
interleukins  
leukocytes  
lymphocytes  
monocytes  
neutrophils  
physiological defenses

### immunity

GS physiological defenses  
. **immunity**  
RT immune systems  
immunosuppression  
infectious diseases  
inoculation  
∞ resistance  
toxins and antitoxins

### immunoassay

DEF An assay that utilizes antigen-antibody reactions for the determination of biochemical substances. Used for plasma renin activity.  
UF *plasma renin activity*  
GS **immunoassay**  
. radioimmunoassay  
RT antigens  
assaying  
biochemistry  
immune systems  
immunology  
radiobiology

### immunology

GS medical science  
. **immunology**  
RT acquired immunodeficiency syndrome  
allergic diseases  
anaphylaxis  
antibodies  
antigens  
antiserums  
biocompatibility  
∞ biology  
human immunodeficiency virus  
immune systems  
immunoassay  
immunosuppression  
interleukins  
lymphatic system  
prophylaxis  
radioimmunoassay  
veterinary medicine

### immunosuppression

(added February 2009)  
DEF Deliberate prevention or diminution of immune responses through the use of drugs, radiation, lymphocyte depletion, desensitization, or the simultaneous use of these methods.  
RT aerospace medicine  
antibodies  
cancer  
diseases  
immune systems  
immunity  
immunology  
transplantation

### IMP

UF *Interplanetary Monitoring Platform*  
GS artificial satellites  
. lunar satellites  
. . **IMP**  
. scientific satellites  
. . Explorer satellites  
. . . **IMP**  
lunar spacecraft  
. lunar satellites  
. . **IMP**

*IMP-1*  
USE **Explorer 18 satellite**

*IMP-2*  
USE **Explorer 21 satellite**

*IMP-3*  
USE **Explorer 28 satellite**

*IMP-4*  
USE **Explorer 34 satellite**

*IMP-5*  
USE **Explorer 41 satellite**

*IMP-6*  
USE **Explorer 43 satellite**

*IMP-7*  
USE **Explorer 47 satellite**

*IMP-8*  
USE **Explorer 50 satellite**

*IMP-A*  
USE **Explorer 18 satellite**

### impact

GS **impact**  
. economic impact  
. electron impact  
. hypervelocity impact  
. ion impact  
. point impact  
. proton impact  
RT deceleration  
hydrodynamic ram effect  
impingement  
mechanical shock  
penetration  
percussion  
pressure  
shock absorbers  
shock resistance  
shock waves  
stresses

### impact acceleration

DEF The acceleration generated by very sudden starts or stops of a vehicle. The term is usually applied in the context of physiological acceleration. Used for impact deceleration.  
UF *impact deceleration*  
GS rates (per time)  
. acceleration (physics)  
. . **impact acceleration**  
RT ∞ acceleration  
deceleration  
impact velocity  
mechanical shock  
physiological acceleration  
railroad humping tests  
shock absorbers

### impact damage

GS damage  
. **impact damage**  
. . meteoritic damage  
. . rain impact damage  
RT cratering  
craters  
ejecta  
impact tolerances  
Mars craters  
meteoroid protection  
planetary craters  
Tempel 1 comet

### impact deceleration

USE **impact acceleration**

### impact fusion

DEF The conversion of the kinetic energy of a fast moving, initially stationary, macroparticle projectile into the internal energy of fusile material using a particle accelerator. Impact fusion is generally an inertial confinement fusion concept.  
GS inertial confinement fusion  
. **impact fusion**

RT fusion reactors

### impact loads

UF *impact pressures*  
GS loads (forces)  
. compression loads  
. . **impact loads**  
. contact loads  
. . **impact loads**  
. dynamic loads  
. . transient loads  
. . . **impact loads**  
RT blast loads  
dynamic pressure  
fiber orientation  
impact velocity  
landing loads  
loading rate  
random loads  
shock loads  
structural design criteria

### impact melts

DEF Molten material resulting from hypervelocity impact.  
GS melts (crystal growth)  
. **impact melts**  
RT celestial bodies  
hypervelocity impact  
lunar rocks  
melting  
meteorites  
minerals  
petrology

### impact prediction

UF *ARIP (impact prediction)*  
*automatic rocket impact predictors*  
GS predictions  
. **impact prediction**  
RT ballistic trajectories  
downrange  
guidance (motion)  
laser guidance  
missile trajectories  
range safety  
reentry  
trajectory analysis

### impact pressures

USE **impact loads**

### impact resistance

UF *impact sensitivity*  
GS sensitivity  
. **impact resistance**  
shock resistance  
. **impact resistance**  
RT crashworthiness  
propellant sensitivity  
∞ resistance  
tolerances (physiology)

### impact sensitivity

USE **impact resistance**

### impact strength

DEF The amount of energy required to fracture a material. The type of specimen and the testing conditions affect the values and therefore should be specified.  
GS mechanical properties  
. **impact strength**  
RT brittle materials  
brittleness  
ductility  
earthquake resistance  
hardness  
notch sensitivity  
∞ resistance  
shear properties  
∞ strength  
stress concentration  
wave resistance

### impact testing machines

RT drop tests  
fatigue tests  
∞ machinery

∞ test equipment

### impact tests

- GS **impact tests**  
 . Charpy impact test
- RT brittleness  
 compression tests  
 destructive tests  
 drop tests  
 fatigue tests  
 hardness tests  
 impactors  
 load tests
- ∞ materials tests  
 notch sensitivity  
 notch strength  
 notch tests  
 shock tests  
 strain rate  
 stress concentration
- ∞ tests  
 toughness

### impact tolerances

- GS tolerances (mechanics)  
 . **impact tolerances**
- RT impact damage

### impact velocity

- (added April 1997)
- GS velocity  
 . **impact velocity**
- RT collisions  
 hypervelocity impact  
 impact acceleration  
 impact loads  
 terminal ballistics  
 terminal velocity

### impactors

- RT crushers  
 grinding mills  
 hammers  
 impact tests

### impairment

- RT damage  
 immobilization  
 injuries  
 losses

### IMPATT diodes

USE **avalanche diodes**

### IMP-B

USE **Explorer 21 satellite**

### IMP-C

USE **Explorer 28 satellite**

### IMP-D

USE **Explorer 33 satellite**

### IMP-E

USE **Explorer 35 satellite**

### impedance

DEF The total opposition that a circuit presents to the flow of an alternating current, specifically the complex quotient of voltage divided by current. Used for dummy loads.

- UF *dummy loads*
- GS **impedance**  
 . acoustic impedance  
 . electrical impedance  
 . . . electrical resistance  
 . . . . contact resistance  
 . . . . Hall resistance  
 . . . . skin resistance  
 . . . . transconductance  
 . . reactance  
 . mechanical impedance  
 . respiratory impedance
- RT attenuation coefficients  
 bandwidth  
 chokes (restrictions)
- ∞ conductivity  
 constrictions  
 damping  
 diffusivity  
 dynamic characteristics

- dynamic response  
 electric coils  
 electrical properties
- ∞ hydraulics  
 mechanical properties
- ∞ physical properties
- ∞ resistance  
 resonant frequencies  
 Smith chart  
 time constant  
 transient response

### impedance matching

- RT antenna couplers  
 couplers  
 coupling circuits  
 directional couplers  
 electric networks  
 electrical impedance  
 iterative networks  
 matching  
 mode transformers  
 transfer functions  
 transmission lines  
 waveguide tuners  
 waveguide windows

### impedance measurement

- RT electrical impedance  
 electrical measurement  
 mechanical impedance  
 mismatch (electrical)  
 radio frequency impedance probes

### impedance probes

- GS measuring instruments  
 . **impedance probes**  
 . . radio frequency impedance probes
- RT resonance probes

### impeller blades

USE **rotor blades (turbomachinery)**

### impellers

DEF Devices that impart motion to a fluid; specifically in centrifugal compressors, rotary disks which, faced on one or both sides with radial vanes, accelerate the incoming fluid outward into diffusers.

- GS rotating bodies  
 . rotors  
 . . **impellers**  
 . . . pump impellers
- RT blowers  
 centrifugal compressors  
 centrifugal pumps  
 compressor rotors  
 pumps  
 rotor blades (turbomachinery)  
 stators  
 turbine wheels  
 turbines  
 turbomachine blades  
 vanes

### imperfections

USE **defects**

### Imperial Valley (CA)

- GS valleys  
 . **Imperial Valley (CA)**
- RT California  
 deserts  
 Mexico

### IMP-F

USE **Explorer 34 satellite**

### IMP-G

USE **Explorer 41 satellite**

### IMP-H

USE **Explorer 47 satellite**

### IMP-I

USE **Explorer 43 satellite**

### impingement

DEF A process resulting in a continuing succession of impacts between (liquid or solid)

particles and a solid phase.

- GS **impingement**  
 . jet impingement
- RT ablation  
 attenuation  
 cavitation flow  
 corrosion  
 erosion  
 gas-solid interactions  
 impact  
 incidence  
 reflection  
 scattering

### IMP-J

USE **Explorer 50 satellite**

### implantation

- GS **implantation**  
 . heart implantation  
 . ion implantation
- RT grafting  
 injection  
 insertion

### implanted electrodes (biology)

- GS bioengineering  
 . bioinstrumentation  
 . . **implanted electrodes (biology)**  
 electrodes  
 . **implanted electrodes (biology)**
- RT ∞ biology

### implication

RT inference

### implosions

DEF The rapid inward collapsing of the walls of vacuum systems or devices as the result of failure of the walls to sustain the ambient pressure.

- RT bursts  
 explosions  
 explosive decompression  
 propellant explosions  
 shock waves

### impregnating

- RT chemical attack  
 coatings  
 finishes  
 insertion  
 lubrication  
 permeating  
 porosity  
 preserving  
 self lubricating materials  
 self lubrication

### improperly-posed problems (mathematics)

USE **ill-posed problems (mathematics)**

### Improved TIROS Operational Satellites

USE **ITOS satellites**

### improvement

- RT correction  
 public relations  
 upgrading

### impulse generators

DEF Standard reference sources of broadband impulse energy.

RT ∞ generators  
 impulses  
 pulse generators  
 turbines

### impulses

DEF The products of the forces and the times during which the forces are applied.

- GS **impulses**  
 . high impulse  
 . specific impulse  
 . total impulse
- RT impulse generators

### impurities

- RT contaminants  
 crystal defects  
 dirt



## in situ measurement

heterogeneity  
inclusions  
point defects  
pseudopotentials  
quality  
trace contaminants  
ultrapure metals  
wastes

IMS

USE **International Magnetospheric Study**

### in situ measurement

(added September 1992)

DEF In situ is Latin for "in original place". It refers to measurements made at the actual location of the object or material measured.

RT atmospheric composition  
atmospheric sounding  
balloon sounding  
ground truth  
∞ measurement  
optical measurement  
pollution monitoring  
remote sensing  
rocket sounding  
temperature measurement

### in situ resource utilization

(added August 2001)

DEF The use of indigenous materials at a planetary or other extraterrestrial landing site for the production of propellants, life support consumables, or other needed materials.

UF *indigenous space materials utilization*  
*ISMU (resource utilization)*  
*ISRU (resource utilization)*

GS utilization

. **in situ resource utilization**

RT consumables (spacecraft)  
extraterrestrial resources  
fuel production  
lunar resources  
manned Mars missions  
materials recovery  
oxygen production  
planetary bases

### in vitro methods and tests

(added May 1999)

DEF Tests of, or methods related to, biological or biochemical processes occurring in an artificial environment or outside of a living cell or organism.

GS **in vitro methods and tests**

. polymerase chain reaction

RT bioassay  
biotechnology  
conditions  
culture techniques  
cultured cells  
cytology  
fertilization  
histology  
∞ methodology  
∞ tests  
tissue engineering

### in vivo methods and tests

(added May 1999)

DEF Tests of, or methods related to, biological or biochemical processes occurring within a living cell or organism.

RT animal models  
bioassay  
biotechnology  
conditions  
culture techniques  
cytology  
histology  
intravenous procedures  
∞ methodology  
∞ tests

inactivation

USE **deactivation**

### incandescence

DEF Emission of light due to high tempera-

ture of the emitting material. Any other emission of light is called luminescence.

GS emission  
. light emission  
. . **incandescence**

RT brightness  
color  
emissivity  
illuminators  
light (visible radiation)  
luminescence  
luminosity  
luminous intensity  
radiance  
spectral emission  
thermal emission

### incendiary ammunition

GS ammunition  
. **incendiary ammunition**

RT bombs (ordnance)  
combustion  
exothermic reactions  
grenades  
guns (ordnance)  
igniters  
missiles  
projectiles  
propellants  
pyrotechnics  
∞ rockets

### incentive techniques

RT cost incentives  
cost reduction  
efficiency  
management  
value engineering

### incentives

GS **incentives**  
. contract incentives  
RT income  
management  
management methods  
motivation  
personnel

### incidence

DEF Partial coincidence, as a circle and a tangent line. The impingement of a ray on a surface.

GS **incidence**  
. grazing incidence  
RT angles (geometry)  
impingement

### incident radiation

RT bistatic reflectivity  
corpuscular radiation  
electromagnetic radiation  
obliqueness  
optical reflection  
photon beams  
∞ radiation  
reflected waves  
refracted waves  
retroreflection  
scattering  
Stokes law of radiation  
wave incidence control

incineration

USE **incinerators**

### incinerators

UF *incineration*  
RT burners  
furnaces  
waste disposal  
waste energy utilization

∞ **inclination**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF The angle between the plane of an orbit and the reference plane. The equator is the reference plane for geocentric orbits and the ecliptic is the reference plane for heliocentric orbits. Also the magnetic dip.

RT geomagnetism  
magnetic equator  
orbits  
slopes  
tendencies

### inclusions

GS defects  
. **inclusions**  
RT casting  
castings  
clathrates  
heterogeneity  
impurities  
metallography  
veins (petrology)  
voids

### incoherence

RT discontinuity  
nonsynchronization

### incoherent scatter radar

DEF Radar used in the study of the ionosphere, thermosphere, etc.

GS radar  
. **incoherent scatter radar**  
. . EISCAT radar system (Europe)  
RT incoherent scattering  
radar scattering

### incoherent scattering

DEF The phenomena of generating waves with random variations in phase, amplitude, polarization, and direction of propagation when an incident wave encounters matter.

GS scattering  
. **incoherent scattering**  
RT coherent scattering  
EISCAT radar system (Europe)  
electromagnetic radiation  
electromagnetic wave transmission  
incoherent scatter radar  
nuclear scattering  
radar scattering

### income

RT budgeting  
economics  
incentives

### incompatibility

RT corrosion  
hazards  
∞ interference  
solubility

### incompressibility

RT compressibility  
fluid mechanics

### incompressible boundary layer

GS boundary layers  
. **incompressible boundary layer**  
RT laminar boundary layer  
turbulent boundary layer

### incompressible flow

GS fluid flow  
. **incompressible flow**  
. . Stokes flow  
RT aerodynamics  
Beltrami flow  
compressible flow  
gas flow  
Milne-Thomson method  
Navier-Stokes equation  
Reynolds stress  
stream functions (fluids)  
subsonic flow

### incompressible fluids

GS **incompressible fluids**  
. micropolar fluids  
RT Boussinesq approximation  
channel flow  
compressible fluids  
fluid power  
∞ fluids  
ideal fluids

- Navier-Stokes equation  
Oseen approximation  
superfluidity
- Inconel (trademark)**  
GS alloys  
. nickel alloys  
. . **Inconel (trademark)**  
RT chromium alloys  
iron alloys
- increasing**  
RT accumulations  
augmentation  
growth  
magnification  
promotion  
swelling
- indene**  
GS organic compounds  
. cyclic compounds  
. . cyclic hydrocarbons  
. . . **indene**  
. hydrocarbons  
. . cyclic hydrocarbons  
. . . **indene**
- indentation**  
GS **indentation**  
. nanoindentation  
RT deformation  
hardness
- independent variables**  
DEF Any of those variables of a problem, chosen according to convenience, which may arbitrarily be specified, and which then determine the other or dependent variables of the problem. The independent variables are often called the coordinates, particularly in problems involving motion in space. Dependent and independent variables can be interchanged, e.g., height and pressure. Used for arguments (mathematics) and parameters.  
UF *arguments (mathematics)*  
*parameters*  
GS **independent variables**  
. lattice parameters  
RT dependent variables  
distributed parameter systems  
observability (systems)  
parameter identification  
∞ variable
- ∞ **indexes**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT indexes (documentation)  
indexes (ratios)  
KP index  
KWIC indexes
- indexes (documentation)**  
DEF Ordered reference lists of contents of a file or document, together with keys or reference notations for identification or location of those contents.  
GS classifications  
. **indexes (documentation)**  
. . KWIC indexes  
. . Wiswesser notations  
RT abstracts  
bibliographies  
∞ catalogs  
documentation  
documents  
handbooks  
∞ indexes  
indexing (information science)  
information dissemination  
information retrieval  
lists  
literature  
∞ reference systems  
selective dissemination of information  
sky surveys (astronomy)  
space glossaries  
summaries  
supplements
- thesauri
- indexes (ratios)**  
GS ratios  
. **indexes (ratios)**  
. . KP index  
. . morphological indexes  
. . vegetative index  
. . . leaf area index  
. . . normalized difference vegetation index  
RT efficiency  
∞ indexes  
mass to light ratios
- indexing (information science)**  
(added April 2000)  
DEF The representation of document content in a systematic, organized form to support information location, retrieval, or analysis.  
UF *automatic indexing*  
*document indexing*  
*machine aided indexing*  
GS information analysis  
. **indexing (information science)**  
RT indexes (documentation)  
information management  
information retrieval  
metadata  
terminology  
terms  
thesauri
- India**  
GS nations  
. **India**  
RT Asia  
Bangladesh  
Bhutan  
Himalayas  
Indian spacecraft  
ISRO  
Sikkim
- Indian Ocean**  
GS oceans  
. **Indian Ocean**  
RT Arabian Sea  
Indonesia  
Madagascar  
Mauritius  
mid-ocean ridges  
Seychelles
- Indian space program**  
GS programs  
. space programs  
. . **Indian space program**  
RT communication satellites  
manned space flight  
∞ research projects  
satellite design  
space missions  
∞ spacecraft  
spacecraft design  
technology utilization
- Indian Space Research Organization*  
USE **ISRO**
- Indian spacecraft**  
UF *Aryabhata*  
*INSAT satellites*  
*IRS (Indian spacecraft)*  
*SEO (Indian spacecraft)*  
RT India  
∞ spacecraft
- Indiana**  
GS nations  
. United States  
. . **Indiana**  
RT Ohio River (US)  
Wabash River Basin (IL-IN-OH)
- indicating instruments**  
UF *temperature indicators*  
GS measuring instruments  
. **indicating instruments**  
. . approach indicators
- . . astrolabes  
. . attitude indicators  
. . . gyro horizons  
. . cloud height indicators  
. . compasses  
. . . gyrocompasses  
. . . magnetic compasses  
. . . solar compasses  
. . flow direction indicators  
. . . wind vanes  
. . position indicators  
. . . plan position indicators  
. . radio direction finders  
. . . spacecraft position indicators  
. . smoke detectors  
. . speed indicators  
. . . tachometers  
. . weight indicators  
. . . microbalances  
. . . strain gage balances  
. . . thermobalances  
RT aircraft instruments  
control moment gyroscopes  
∞ detectors  
dials  
display devices  
flat panel displays  
gas detectors  
head-up displays  
helmet mounted displays  
∞ indication  
∞ indicators  
instrument receivers  
∞ instruments  
radarscopes  
recording instruments  
thermocouples  
thermopiles
- ∞ **indication**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT evaluation  
indicating instruments  
probability theory  
signs and symptoms
- ∞ **indicators**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aircraft guidance  
chemical indicators  
indicating instruments  
methylene blue  
rate of climb indicators
- indigenous space materials utilization*  
(added August 2001)  
USE **in situ resource utilization**
- indium**  
GS chemical elements  
. **indium**  
metals  
. **indium**
- indium alloys**  
GS alloys  
. **indium alloys**  
RT aluminum alloys  
gallium alloys  
lead alloys  
tin alloys
- indium aluminum arsenides**  
(added November 1994)  
GS aluminum compounds  
. aluminum arsenides  
. . **indium aluminum arsenides**  
arsenic compounds  
. arsenides  
. . aluminum arsenides  
. . . **indium aluminum arsenides**  
. . indium arsenides  
. . . **indium aluminum arsenides**  
indium compounds  
. indium arsenides  
. . **indium aluminum arsenides**  
RT ∞ chemical compounds

## indium antimonides

field effect transistors  
high electron mobility transistors  
molecular beam epitaxy  
p-type semiconductors

### indium antimonides

GS antimony compounds  
. antimonides  
. . . **indium antimonides**  
indium compounds  
. **indium antimonides**  
RT semiconductors (materials)

### indium arsenides

GS arsenic compounds  
. arsenides  
. . . **indium arsenides**  
. . . . indium aluminum arsenides  
. . . . indium gallium arsenides  
indium compounds  
. **indium arsenides**  
. . . indium aluminum arsenides  
. . . indium gallium arsenides  
RT MODFETS

### indium compounds

GS **indium compounds**  
. indium antimonides  
. indium arsenides  
. . . indium aluminum arsenides  
. . . indium gallium arsenides  
. indium oxides  
. indium phosphates  
. indium phosphides  
. indium selenides  
. . . copper indium selenides  
. indium sulfides  
. indium tellurides  
RT ∞ chemical compounds  
∞ Group 3A compounds  
∞ metal compounds

### indium gallium arsenides

(added May 1991)  
GS arsenic compounds  
. arsenides  
. . . gallium arsenides  
. . . **indium gallium arsenides**  
. . . indium arsenides  
. . . . **indium gallium arsenides**  
gallium compounds  
. gallium arsenides  
. . . **indium gallium arsenides**  
indium compounds  
. indium arsenides  
. . . **indium gallium arsenides**  
RT intermetallics  
quantum well lasers  
semiconductors (materials)

### indium isotopes

GS chemical elements  
. nuclides  
. . . isotopes  
. . . . radioactive isotopes  
. . . . . **indium isotopes**  
metals  
. **indium isotopes**

### indium oxides

(added July 1995)  
GS chalcogenides  
. oxides  
. . . **indium oxides**  
indium compounds  
. **indium oxides**  
RT ∞ chemical compounds

### indium phosphates

GS indium compounds  
. **indium phosphates**  
phosphorus compounds  
. phosphates  
. . . **indium phosphates**

### indium phosphides

GS indium compounds  
. **indium phosphides**  
phosphorus compounds  
. phosphides

. . . **indium phosphides**  
RT quantum well lasers  
transferred electron devices

### indium selenides

(added June 1995)  
GS chalcogenides  
. selenides  
. . . **indium selenides**  
. . . . copper indium selenides  
indium compounds  
. **indium selenides**  
. . . copper indium selenides  
selenium compounds  
. selenides  
. . . **indium selenides**  
. . . . copper indium selenides  
RT semiconductors (materials)  
solar cells  
thin films

### indium sulfides

GS chalcogenides  
. sulfides  
. . . inorganic sulfides  
. . . . **indium sulfides**  
indium compounds  
. **indium sulfides**  
sulfur compounds  
. sulfides  
. . . inorganic sulfides  
. . . . **indium sulfides**

### indium tellurides

GS chalcogenides  
. tellurides  
. . . **indium tellurides**  
indium compounds  
. **indium tellurides**  
tellurium compounds  
. tellurides  
. . . **indium tellurides**  
RT semiconductors (materials)

### indium-tin-oxide semiconductors

USE **ITO (semiconductors)**

### indoleacetic acids

(added August 2004)  
DEF Acetic acid derivatives of the heterocyclic compound indole.  
GS acids  
. **indoleacetic acids**  
RT biochemistry  
indoles  
plant growth regulators

### indoles

GS organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . . **indoles**  
. . . . . tryptamines  
. . . . . tryptophan  
. . . . . melatonin  
. . . . . serotonin  
RT indoleacetic acids  
methoxy systems  
pyrroles

### Indonesia

GS landforms  
. islands  
. . . **Indonesia**  
nations  
. **Indonesia**  
RT Indian Ocean  
Indonesian space program  
Pacific Ocean

### Indonesian space program

GS programs  
. space programs  
. . . **Indonesian space program**  
RT Indonesia  
Palapa 2 satellite  
Palapa satellites

### indoor air pollution

DEF Pollution found in enclosed spaces of-

ten compounded by insufficient air mixing which intensifies the concentration of pollutants caused by outdoor and/or indoor sources.

GS pollution  
. environment pollution  
. . . air pollution  
. . . . **indoor air pollution**  
RT air quality  
air sampling  
buildings  
volatile organic compounds

### induced drag

(added July 1992)  
GS dynamic characteristics  
. drag  
. . . **induced drag**  
RT aerodynamic characteristics  
aerodynamic drag  
aircraft design  
drag reduction

### induced fluid flow

USE **fluid flow**

### inductance

GS electrical properties  
. **inductance**  
. . . proximity effect (electricity)  
electromagnetic properties  
. **inductance**  
. . . proximity effect (electricity)  
RT capacitance  
electrical impedance  
LC circuits  
magnetic induction  
magnetic properties  
reactance  
RL circuits  
transformers

### ∞ induction

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
RT arc generators  
derivation  
induction (mathematics)  
inference  
initiation  
magnetic induction  
number theory

### induction (mathematics)

GS number theory  
. **induction (mathematics)**  
RT ∞ induction  
mathematical logic

### induction heating

DEF The generation of heat in any conducting material by means of magnetic flux-induced currents.

GS heating  
. **induction heating**  
RT furnaces  
magnetic induction  
magnetic pumping  
melting  
plasma heating  
radio frequency heating  
vacuum melting

### induction motors

DEF Ac motors in which the primary winding on one member (usually the stator) is connected to the power source and a polyphase secondary winding or a squirrel-cage secondary winding on the other member (usually the rotor) carries induced current.

GS electromechanical devices  
. electric motors  
. . . **induction motors**  
motors  
. electric motors  
. . . **induction motors**  
RT alternating current  
armatures  
asynchronous motors  
∞ electric power  
electric power supplies

- power factor controllers
  - ∞ rotating electrical machines
  - synchronous motors
- induction systems*
- USE **intake systems**
- inductively coupled plasma mass spectrometry**  
(added March 2001)
- DEF Multi-element analytical technique that uses high temperature plasma, commonly argon, to dissociate molecules and ionize atoms, which are passed into a vacuum, and sorted based on their atomic mass-to-charge ratios.
- UF *ICP-MS (spectrometry)*  
*LA-ICP-MS (spectrometry)*
- GS spectroscopy  
. mass spectrometry  
. . **inductively coupled plasma mass spectrometry**
- RT chemical analysis  
microanalysis  
qualitative analysis  
spectroscopic analysis  
vacuum spectroscopy
- inductors**
- RT arc generators  
ballasts (impedances)  
circuits
- ∞ coils  
electric energy storage  
energy storage  
magnet coils  
toroids
- industrial areas**
- RT cities  
commerce  
construction industry
- ∞ facilities  
industries  
land use  
marketing  
megalopolises  
regional planning  
shipyards  
site selection  
urban development  
urban transportation
- industrial energy**
- RT allocations  
commercial energy  
distributing  
domestic energy  
economic factors
- ∞ energy  
energy consumption  
energy conversion  
transportation energy
- industrial management**
- UF *business management*
- GS management  
. **industrial management**  
. . engineering management  
. . inventory management  
. . . inventory controls  
. . personnel management
- RT concurrent engineering  
group technology (manufacturing)  
production management  
research management  
systems management  
total quality management
- industrial plants**
- UF *factories*  
*plants (industries)*
- GS **industrial plants**  
. foundries
- RT construction industry
- ∞ facilities  
pilot plants
- industrial safety**
- GS safety  
. **industrial safety**
- RT accidents  
benzene poisoning  
beryllium poisoning  
carbon tetrachloride poisoning  
health physics  
hydrocarbon poisoning  
industries  
occupation  
reactor safety
- industrial wastes**
- GS wastes  
. **industrial wastes**
- RT heavy metals  
industries  
landfills  
liquid wastes  
soil pollution  
solid wastes  
waste disposal  
waste utilization  
waste water
- industries**
- GS **industries**  
. aerospace industry  
. . aircraft industry  
. construction industry  
. defense industry  
. . weapons industry
- RT aircraft production costs  
commerce  
commercial spacecraft  
contract negotiation  
contractors  
economic development  
economic impact  
fishing  
gross national product  
industrial areas  
industrial safety  
industrial wastes  
manufacturing  
personnel subsystems  
retirement  
shipyards  
space industrialization  
space manufacturing  
technologies  
technology assessment  
technology utilization  
tourism  
utilities
- inelastic bodies*
- USE **rigid structures**
- inelastic collisions**
- DEF Collisions between two particles in which changes occur both in the internal energy of one or both of the particles and in the sums, before and after collisions, of their kinetic energies.
- GS collisions  
. **inelastic collisions**
- RT scattering
- inelastic scattering**
- GS scattering  
. **inelastic scattering**
- RT coherent scattering  
Compton effect  
elastic scattering  
electron scattering  
Mandelstam representation  
nuclear scattering  
quark parton model
- inelastic stress**
- DEF A force acting on a solid and producing a deformation such that the original shape and size of the solid are not restored after the force is removed.
- RT cyclic loads  
mathematical models  
metal fatigue  
stress analysis
- stress-strain diagrams
- inequalities**
- GS **inequalities**  
. Schwartz inequality
- RT ∞ mathematics
- inert atmosphere**
- DEF A gaseous medium that because of its lack of chemical reaction is used to enclose tests or equipment.
- GS controlled atmospheres  
. **inert atmosphere**
- inert gases*
- USE **rare gases**
- inertia**
- DEF Resistance to acceleration. Used for inertial forces.
- UF *inertial forces*
- GS **inertia**  
. inertia principle  
. . Mach inertia principle
- RT ∞ force  
Froude number  
mass  
moments of inertia  
∞ motion  
similitude law
- inertia bonding**
- DEF The joining of materials with friction and pressure.
- GS bonding  
. **inertia bonding**
- RT ∞ joining  
metal-metal bonding
- inertia moments*
- USE **moments of inertia**
- inertia principle**
- GS inertia  
. **inertia principle**  
. . Mach inertia principle
- RT equations of motion  
moments of inertia
- inertia wheels*
- USE **counter-rotating wheels**  
**reaction wheels**
- inertial confinement fusion**
- DEF The process of using intense beams of heavy ions to convey the energy needed to compress and heat small pellets containing deuterium-tritium fuels to achieve ignition of the pellets.
- GS **inertial confinement fusion**  
. impact fusion
- RT fusion propulsion  
strongly coupled plasmas
- inertial coordinates**
- GS coordinates  
. **inertial coordinates**
- RT Astroguidance Navigation System  
geocentric coordinates  
inertialess steerable antennas
- inertial forces*
- USE **inertia**
- inertial fusion (reactor)**
- DEF Reactors in which pellet fusion is initiated by high energy sources including lasers.
- RT ∞ fusion  
fusion reactors  
ion beams  
laser fusion  
laser plasmas  
nuclear fuels  
plasma compression  
pulsed lasers  
relativistic electron beams
- inertial guidance**
- DEF Guidance by means of the measurement and integration of acceleration from within the craft.

## inertial navigation

GS guidance (motion)  
  . **inertial guidance**  
  . . strapdown inertial guidance

RT injection guidance  
  midcourse guidance  
  reentry guidance  
  satellite guidance  
  spacecraft guidance  
  stabilized platforms  
  terminal guidance

*inertial measuring units*  
  USE **inertial platforms**

**inertial navigation**  
  DEF Dead reckoning performed automatically by a device which gives a continuous indication of position by integration of accelerations since leaving a starting point.  
  GS navigation  
    . **inertial navigation**  
    . . Astroguide Navigation System  
    . . gimballess inertial navigation

RT acceleration measurement  
  air navigation  
  all-weather air navigation  
  celestial navigation  
  dead reckoning  
  digital navigation  
  hyperbolic navigation  
  navigation aids  
  polar navigation  
  radar navigation  
  radio navigation  
  Schuler tuning  
  space navigation  
  star trackers  
  strapdown inertial guidance  
  surface navigation

**inertial platforms**  
  UF *inertial measuring units*  
  RT gimballess inertial navigation  
  gyroscopic stability  
  Kalman-Schmidt filtering  
  navigation instruments  
  ∞ platforms  
  three axis stabilization

**inertial reference systems**  
  RT celestial reference systems  
  ∞ reference systems  
  relativity  
  ∞ systems

**Inertial Upper Stage**  
  DEF A solid propulsive upper stage designed to place spacecraft on high Earth orbits or on escape trajectories for planetary missions.  
  UF *interim upper stage (STS)*  
  IUS

GS interim stages (spacecraft)  
  . **Inertial Upper Stage**

RT orbit transfer vehicles  
  recoverable spacecraft  
  reusable spacecraft  
  Space Shuttle orbiters  
  space shuttles  
  space transportation  
  space transportation system  
  space tugs  
  Ulysses mission  
  upper stage rocket engines

**inertialess steerable antennas**  
  GS antennas  
    . directional antennas  
    . . steerable antennas  
    . . . **inertialess steerable antennas**  
    arrays  
    . antenna arrays  
    . . steerable antennas  
    . . . **inertialess steerable antennas**

RT communication equipment  
  inertial coordinates

**infarction**  
  GS diseases  
    . heart diseases  
    . . **infarction**

. . . myocardial infarction

RT embolisms  
  thrombosis  
  tissues (biology)

*infections*  
  USE **infectious diseases**

**infectious diseases**  
  UF *infections*  
  GS diseases  
    . **infectious diseases**  
    . . airborne infection  
    . . bacterial diseases  
    . . . cholera  
    . . . diphtheria  
    . . . keratitis  
    . . . syphilis  
    . . . tuberculosis  
    . . . typhoid  
    . . . typhus  
    . . conjunctivitis  
    . . dermatitis  
    . . . contact dermatitis  
    . . fungal diseases  
    . . hepatitis  
    . . meningitis  
    . . parasitic diseases  
    . . viral diseases  
    . . . acquired immunodeficiency syndrome  
    . . . influenza  
    . . . poliomyelitis  
    . . . smallpox

RT antiseptics  
  Aspergillus  
  biological weapons  
  ∞ blisters  
  epidemiology  
  immunity  
  leukopenia

**inference**  
  RT assumptions  
  deduction  
  hypotheses  
  implication  
  ∞ induction

**infestation**  
  UF *insect damage*  
  RT beetles  
  boll weevils  
  bollworms  
  chironomus flies  
  flatworms  
  insects  
  larvae  
  locusts  
  moths  
  parasites  
  plants (botany)  
  silkworms  
  worms

**infiltration**  
  GS **infiltration**  
    . chemical vapor infiltration

RT air conditioning  
  permeability  
  porosity  
  resin film infusion  
  voids  
  warfare

*infinite impulse response filters*  
  (added December 2002)  
  USE **IIR filters**

**infinite span wings**  
  GS airfoils  
    . thin airfoils  
    . . thin wings  
    . . . **infinite span wings**  
    . wings  
    . . slender wings  
    . . . **infinite span wings**  
    . . thin wings  
    . . . **infinite span wings**  
    . . unswept wings

. . . **infinite span wings**  
  planforms  
  . wing planforms  
  . . **infinite span wings**

RT flexible wings

**infinity**  
  DEF A point, line, or region, beyond measurable limits.  
  RT functions (mathematics)  
  geometry  
  number theory  
  probability theory  
  real variables  
  series (mathematics)

*inflatable devices*  
  USE **inflatable structures**

**inflatable gliders**  
  GS expandable structures  
  . inflatable structures  
  . . **inflatable gliders**  
  gliders  
  . paragliders  
  . . **inflatable gliders**

RT ∞ aircraft

**inflatable space structures**  
  (added August 1996)  
  GS **inflatable space structures**  
    . inflatable spacecraft  
    . . Beacon satellites  
    . . . Beacon Explorer A  
    . . . Explorer 22 satellite

RT antennas  
  folding structures  
  space erectable structures

**inflatable spacecraft**  
  GS expandable structures  
  . inflatable structures  
  . . **inflatable spacecraft**  
  . . . Beacon satellites  
  . . . Beacon Explorer A  
  . . . Explorer 22 satellite  
  inflatable space structures  
  . **inflatable spacecraft**  
  . . Beacon satellites  
  . . . Beacon Explorer A  
  . . . Explorer 22 satellite  
  space erectable structures  
  . **inflatable spacecraft**  
  . . Beacon satellites  
  . . . Beacon Explorer A  
  . . . Explorer 22 satellite

RT artificial satellites  
  orbital assembly  
  self erecting devices  
  ∞ spacecraft  
  unmanned spacecraft

**inflatable structures**  
  UF *deflating*  
  *inflatable devices*

GS expandable structures  
  . **inflatable structures**  
  . . air bag restraint devices  
  . . balloons  
  . . . high altitude balloons  
  . . . jimsphere balloons  
  . . . skyhook balloons  
  . . . superpressure balloons  
  . . . meteorological balloons  
  . . . jimsphere balloons  
  . . . ROBIN balloons  
  . . . microballoons  
  . . . tethered balloons  
  . . ballutes  
  . . gas bags  
  . . inflatable gliders  
  . . inflatable spacecraft  
  . . . Beacon satellites  
  . . . Beacon Explorer A  
  . . . Explorer 22 satellite

RT airships  
  boats  
  buildings  
  flexible bodies  
  flexible wings

floats  
 folding structures  
 inflating  
 life rafts  
 lunar shelters  
 pneumatic equipment  
 pressure suits  
 radomes  
 self erecting devices  
 space erectable structures  
 space stations  
 ∞ structures  
 tires  
 variable geometry structures

**inflating**

SN (EXCLUDES ECONOMIC INFLATION)  
 RT expansion  
 gas injection  
 growth  
 inflatable structures  
 pressure reduction  
 pressurizing  
 swelling

**inflection points**

GS geometry  
 . Euclidean geometry  
 . . points (mathematics)  
 . . . **inflection points**  
 RT curves (geometry)  
 functions (mathematics)  
 line shape  
 real variables

**in-flight monitoring**

RT crew procedures (inflight)  
 crew procedures (preflight)  
 flight control  
 flight tests  
 monitors  
 telemetry

*inflight simulation*

(added November 1998)  
 USE **in-flight simulation**

**in-flight simulation**

(added October 1998)  
 DEF The use of a specialized test aircraft to simulate the flight characteristics of another vehicle. The test aircraft is typically capable of duplicating the computed responses of the simulated vehicle through special aerodynamic and control system features.  
 UF *inflight simulation*  
 GS simulation  
 . flight simulation  
 . . **in-flight simulation**  
 RT aircraft control  
 flight characteristics  
 flight control  
 flight simulators  
 flight tests  
 training simulators

*in-flight starting*

USE **air start**

**influence coefficient**

GS coefficients  
 . **influence coefficient**  
 . . structural influence coefficients  
 RT aeroelasticity  
 discharge coefficient  
 elastic properties  
 flutter  
 force distribution  
 ∞ hydraulics  
 moment distribution  
 nozzle thrust coefficients  
 plastic properties  
 pressure distribution  
 stress analysis  
 structural analysis

**influenza**

GS diseases  
 . infectious diseases  
 . . viral diseases

. . . **influenza**  
 . respiratory diseases  
 . . **influenza**

**information**

DEF Any facts or data which can be used, transferred, or communicated.

GS **information**  
 . metadata  
 RT annotations  
 audio tapes  
 communicating  
 communication  
 ∞ data  
 documentation  
 mathematical tables  
 news media  
 presentation  
 privacy  
 reports  
 video tapes

**information adaptive system**

DEF The spaceborne portion of the NASA End-to-End Data System.

GS information systems  
 . **information adaptive system**  
 RT communication equipment  
 ∞ systems

**information analysis**

(added April 2000)

GS **information analysis**  
 . data mining  
 . indexing (information science)  
 . scientific visualization  
 . . numerical flow visualization  
 . trend analysis  
 RT information resources management  
 information retrieval  
 natural language processing

**information dissemination**

GS communicating  
 . **information dissemination**  
 . . messages  
 . . selective dissemination of information  
 RT bibliographies  
 catalogs (publications)  
 documentation  
 electronic publishing  
 extraterrestrial communication  
 indexes (documentation)  
 information transfer  
 integrated library systems  
 Internet resources  
 libraries  
 privacy  
 reports  
 summaries  
 websites

**information flow**

RT aerospace technology transfer  
 communicating  
 communication  
 ∞ flow  
 information transfer  
 management  
 message processing  
 selective dissemination of information  
 technology transfer

**information management**

GS management  
 . **information management**  
 . . information resources management  
 . . records management  
 RT communicating  
 communication  
 data base management systems  
 data retrieval  
 data storage  
 indexing (information science)  
 information transfer  
 integrated library systems

technology transfer

*Information Power Grid*

(added December 2003)

USE **grid computing (computer networks)**

**information processing (biology)**

DEF An approach to the study of perception, memory, language and/or thought that considers organisms to be complex systems that receive, transform, store and transmit information.

RT artificial intelligence  
 bioelectricity  
 brain  
 cognition  
 cognitive psychology  
 electrophysiology  
 human performance  
 neurophysiology  
 perception  
 psychophysiology

**information resources management**

(added September 1995)

DEF A comprehensive strategy for managing an organization's information resources throughout the information life cycle, including creation, collection, use, processing, and dissemination.

UF *IRM*  
 GS management  
 . information management  
 . . **information resources management**  
 . resources management  
 . . **information resources management**  
 RT computer information security  
 data management  
 data processing  
 documentation  
 information analysis  
 information transfer  
 Internet resources  
 libraries  
 records management  
 websites

**information retrieval**

GS retrieval  
 . **information retrieval**  
 RT abstracts  
 bibliographies  
 CD-ROM  
 command languages  
 computers  
 data processing  
 data retrieval  
 documentation  
 documents  
 hypertext  
 indexes (documentation)  
 indexing (information science)  
 information analysis  
 information transfer  
 integrated library systems  
 interservice data exchange program  
 libraries  
 management information systems  
 metadata  
 numerical data bases  
 on-line systems  
 query languages  
 search profiles  
 selective dissemination of information  
 space glossaries  
 Starsite program  
 subjects  
 thesauri

**information systems**

GS **information systems**  
 . Atmospheric & Oceanographic Inform Sys  
 . Earth Resources Information System  
 . EOS data and information system  
 . geographic information systems  
 . information adaptive system

## information theory

- . integrated library systems
- . knowledge based systems
- . . . expert systems
- . cockpit weather information systems
- . decision support systems
- . management information systems
- . pilot support systems

RT

- CD-ROM
- Earth Observing System (EOS)
- grid computing (computer networks)
- information transfer
- Internet resources
- libraries
- management systems
- multimedia
- networks
- on-line systems
- records management
- selective dissemination of information
- ∞ systems
- systems management
- websites

### information theory

UF *Shannon information theory*

RT ∞

- applications of mathematics
- automata theory
- ∞ automation
- BCH codes
- coding
- combinatorial analysis
- communication theory
- computers
- correction
- correlation
- cryptography
- cybernetics
- data processing
- data transmission
- decision theory
- ergodic process
- error detection codes
- Fisher information
- Fourier analysis
- game theory
- ∞ logic
- machine translation
- management information systems
- ∞ mathematics
- maximum entropy method
- messages
- ∞ noise
- operations research
- parity
- Petri nets
- phase shift keying
- probability theory
- random processes
- redundancy
- Shannon-Wiener measure
- statistical analysis
- ∞ statistics
- stochastic processes
- systems engineering
- telecommunication
- terms
- ∞ theories

### information transfer

RT

- document markup languages
- information dissemination
- information flow
- information management
- information resources management
- information retrieval
- information systems
- international cooperation
- interoperability
- technology transfer
- technology utilization
- World Wide Web

### information transmission

USE **data transmission**

### infrared absorption

DEF The taking up of energy from infrared radiation by a medium through which the radiation is passing.

GS energy absorption

- . radiation absorption
- . . . electromagnetic absorption
- . . . . **infrared absorption**

RT ∞

- absorption
- atmospheric attenuation
- atmospheric optics
- infrared radiation
- light scattering
- optical properties
- thermal emission
- transmittance
- wave attenuation

### infrared astronomy

GS

astronomy

RT

- infrared astronomy**
- astronomical photography
- blazars
- Infrared Astronomy Satellite
- infrared cirrus (astronomy)
- infrared photometry
- infrared sources (astronomy)
- Infrared Space Observatory (ISO)
- James Webb Space Telescope
- Kuiper Airborne Observatory
- Large Deployable Reflector
- SOFIA (airborne observatory)
- Space Infrared Telescope Facility
- Wide-field Infrared Survey Explorer

### Infrared Astronomy Satellite

DEF A joint NASA-Netherlands-Great Britain spacecraft designed to perform astronomical observations in the infrared spectral region. It was launched on January 25, 1983. Used for IRAS.

UF

*IRAS*

GS

- artificial satellites
- . scientific satellites
- . . . astronomical satellites
- . . . . **Infrared Astronomy Satellite**
- observatories
- . astronomical observatories
- . . . astronomical satellites
- . . . . **Infrared Astronomy Satellite**
- RT geosynchronous orbits
- infrared astronomy
- infrared sources (astronomy)
- IRAS-Araki-Alcock comet
- Netherlands space program
- UK satellites
- Wide-field Infrared Survey Explorer

### infrared cirrus (astronomy)

(added September 1989)

RT ∞

- clouds
- cosmic dust
- galactic radiation
- infrared astronomy
- infrared radiation
- infrared sources (astronomy)
- interstellar matter
- molecular clouds

### infrared detectors

UF

*signal-processing-in-the-element detectors*

GS

- SPRITE detectors*
- measuring instruments
- . radiation measuring instruments
- . . . actinometers
- . . . . radiometers
- . . . . . **infrared detectors**
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners
- . . . . . visible infrared spin scan radiometer
- . . . . . quantum well infrared photodetectors
- . . . infrared instruments
- . . . . **infrared detectors**
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners

- . . . . . visible infrared spin scan radiometer
- . . . . . quantum well infrared photodetectors

RT

- bolometers
- ∞ detectors
- electromagnetic measurement
- focal plane devices
- forest fire detection
- infrared signatures
- mercury cadmium tellurides
- x ray detectors

### infrared filters

GS

- electromagnetic wave filters
- . optical filters
- . . . **infrared filters**
- RT electric filters
- ultraviolet filters

### infrared horizon scanners

USE

**horizon scanners**  
**infrared scanners**

### infrared imagery

GS

- imagery
- . photography
- . . . **infrared imagery**
- RT color infrared photography
- lunar equator
- thermography
- x ray imagery

### infrared inspection

GS

- inspection
- . **infrared inspection**
- RT nondestructive tests
- quality control

### infrared instruments

GS

- measuring instruments
- . radiation measuring instruments
- . . . **infrared instruments**
- . . . . infrared detectors
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners
- . . . . . visible infrared spin scan radiometer
- . . . . . quantum well infrared photodetectors
- . . . . . infrared interferometers
- . . . . . infrared spectrometers
- . . . . . filter wheel infrared spectrometers
- . . . . . infrared spectrophotometers
- RT Advanced Very High Resolution Radiometer
- forest fire detection

### infrared interferometers

GS

- measuring instruments
- . interferometers
- . . . **infrared interferometers**
- . . . . radiation measuring instruments
- . . . . . infrared instruments
- . . . . . **infrared interferometers**
- RT astronomical interferometry
- interferometry
- optical equipment
- optical measurement
- optical measuring instruments
- speckle interferometry

### infrared lasers

UF

*infrared masers*  
*IR lasers*  
*irasers*

GS

stimulated emission devices

. lasers

. . . **infrared lasers**

RT

- argon lasers
- carbon dioxide lasers
- carbon lasers
- carbon monoxide lasers
- chemical lasers
- dye lasers
- gas lasers

HF lasers  
liquid lasers  
organic lasers  
quantum cascade lasers  
solid state lasers  
waveguide lasers  
YLF lasers

*infrared masers*

USE **infrared lasers**

**infrared photography**

GS imagery  
. photography  
. . multispectral photography  
. . . **infrared photography**  
. . . . color infrared photography

RT aerial photography  
astronomical photography  
black and white photography  
cinematography  
faint object camera  
forest fire detection  
geographic information systems  
ice mapping  
lunar photography  
meteorological satellites  
METEOSAT satellite  
multispectral band cameras  
Nimbus satellites  
radiometers  
satellite-borne photography  
timber inventory  
ultraviolet photography

**infrared photometry**

DEF Photometry in the infrared region.  
GS optical measurement  
. photometry  
. . **infrared photometry**

RT astronomical photometry  
infrared astronomy  
infrared spectra  
near infrared radiation  
stellar spectrophotometry

**infrared radar**

DEF Radar covering a range from the limit of the visible spectrum to the shortest microwaves.

GS radar  
. **infrared radar**

RT CALIPSO (Pathfinder satellite)  
FLIR detectors  
optical radar  
radar imagery

**infrared radiation**

DEF Electromagnetic radiation lying in the wavelength interval from 75 microns to an indefinite upper boundary sometimes arbitrarily set at 1000 microns (0. 01 centimeter).

GS electromagnetic radiation  
. **infrared radiation**  
. . far infrared radiation  
. . near infrared radiation

RT beams (radiation)  
black body radiation  
coherent electromagnetic radiation  
energy absorption  
evaporography  
exhaust emission  
heat  
infrared absorption  
infrared cirrus (astronomy)  
infrared signatures  
infrared sources (astronomy)  
light (visible radiation)  
microwaves  
monochromatic radiation  
planetary radiation  
polarized electromagnetic radiation

∞ radiation  
Seyfert galaxies  
solar radiation  
sunlight  
terrestrial radiation  
thermal radiation  
wavelengths

xenon lamps

**infrared radiometers**

GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . radiometers  
. . . . infrared detectors  
. . . . . **infrared radiometers**  
. . . . . . Advanced Very High Resolution Radiometer  
. . . . . . infrared scanners  
. . . . . . visible infrared spin scan radiometer  
. . infrared instruments  
. . . infrared detectors  
. . . . **infrared radiometers**  
. . . . . Advanced Very High Resolution Radiometer  
. . . . . infrared scanners  
. . . . . visible infrared spin scan radiometer

RT aerial reconnaissance  
atmospheric correction  
data acquisition  
Earth Resources Program  
environmental monitoring  
forest fire detection  
pressure modulator radiometers  
radiometric correction  
satellite-borne instruments  
thermal mapping

**infrared reflection**

GS reflection  
. **infrared reflection**

RT optical reflection  
radiative heat transfer  
radio echoes  
spread reflection  
ultraviolet reflection

**infrared scanners**

UF *infrared horizon scanners*

GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . radiometers  
. . . . infrared detectors  
. . . . . infrared radiometers  
. . . . . . **infrared scanners**  
. . . . . . infrared instruments  
. . . . . . infrared detectors  
. . . . . . infrared radiometers  
. . . . . . **infrared scanners**  
scanners  
. **infrared scanners**

RT forest fire detection  
horizon scanners  
multispectral band scanners  
optical equipment  
Scanner project  
thermal mapping

**infrared signatures**

DEF The infrared spectral characteristics of an object or uniform land surface which uniquely defines it.

GS signatures  
. **infrared signatures**

RT infrared detectors  
infrared radiation  
infrared spectra  
signature analysis

**infrared sources (astronomy)**

DEF Celestial bodies or astronomical regions emitting a large amount of radiation in the infrared portion of the electromagnetic spectrum.

GS celestial bodies  
. **infrared sources (astronomy)**  
. . infrared stars

RT astronomy  
Herbig-Haro objects  
infrared astronomy  
Infrared Astronomy Satellite  
infrared cirrus (astronomy)

infrared radiation

**Infrared Space Observatory (ISO)**

DEF An astronomical satellite observatory funded by ESA operating at wavelengths from 3 to 200 microns. The observatory is comprised of a 60 cm Cassegrain telescope, a CCD infrared camera, two Michelson interferometers, and a photopolarimeter.

GS artificial satellites  
. ESA satellites  
. . **Infrared Space Observatory (ISO)**  
. . scientific satellites  
. . . astronomical satellites  
. . . . **Infrared Space Observatory (ISO)**

ESA spacecraft  
ESA satellites  
. . **Infrared Space Observatory (ISO)**  
observatories  
. astronomical observatories  
. . astronomical satellites  
. . . **Infrared Space Observatory (ISO)**

telescopes  
. spaceborne telescopes  
. . **Infrared Space Observatory (ISO)**

RT European space programs  
infrared astronomy  
spaceborne astronomy

**infrared spectra**

GS spectra  
. radiation spectra  
. . electromagnetic spectra  
. . . **infrared spectra**

RT ∞ absorption  
emission spectra  
infrared photometry  
infrared signatures  
line spectra  
microwave spectra  
molecular spectra  
solar spectra  
stellar spectra

**infrared spectrometers**

GS measuring instruments  
. optical measuring instruments  
. . **infrared spectrometers**  
. . . filter wheel infrared spectrometers  
. . radiation measuring instruments  
. . . actinometers  
. . . . **infrared spectrometers**  
. . . . . filter wheel infrared spectrometers  
. . . . . infrared instruments  
. . . . . **infrared spectrometers**  
. . . . . filter wheel infrared spectrometers  
. . spectrometers  
. . **infrared spectrometers**  
. . . filter wheel infrared spectrometers  
optical equipment  
. optical measuring instruments  
. . **infrared spectrometers**  
. . . filter wheel infrared spectrometers

RT Ebert spectrometers  
solar spectrometers

**infrared spectrophotometers**

GS measuring instruments  
. optical measuring instruments  
. . spectrophotometers  
. . . **infrared spectrophotometers**  
. . . radiation measuring instruments  
. . . . actinometers  
. . . . . spectrophotometers  
. . . . . **infrared spectrophotometers**  
. . . . . infrared instruments  
. . . . . **infrared spectrophotometers**  
optical equipment  
. optical measuring instruments  
. . spectrophotometers  
. . . **infrared spectrophotometers**

RT chemical analysis  
filter wheel infrared spectrometers



## infrared spectroscopy

photometers

### infrared spectroscopy

GS spectroscopy  
. **infrared spectroscopy**  
RT absorption spectroscopy  
astronomical spectroscopy  
chemical analysis  
electron spectroscopy  
laser spectrometers  
molecular spectroscopy  
molecular structure  
optogalvanic spectroscopy  
Raman spectroscopy  
spectrometers  
spectroscopic analysis  
sulfur hexafluoride  
vacuum spectroscopy

### infrared stars

GS celestial bodies  
. infrared sources (astronomy)  
. . **infrared stars**  
. stars  
. . **infrared stars**  
RT Herbig-Haro objects

### infrared suppression

DEF The shielding and/or protection of aircraft engines and exhausts from heat-seeking missiles and/or detecting devices.  
RT afterburning  
aircraft detection  
aircraft engines  
cooling systems  
exhaust gases  
exhaust nozzles  
heat shielding  
jet engines  
jet exhaust  
reaction products  
suppressors  
temperature control

### infrared telescopes

DEF Special optical instruments for astronomical observations in the range from one micron to one millimeter.  
GS telescopes  
. **infrared telescopes**  
. . Large Deployable Reflector  
. . Space Infrared Telescope Facility  
RT astronomy  
Astroplane  
James Webb Space Telescope  
Next Generation Space Telescope  
project

### infrared tracking

GS tracking (position)  
. **infrared tracking**  
RT antimissile missiles  
compensatory tracking  
homing devices  
missile tracking  
optical tracking  
pursuit tracking  
radiometers

### infrared windows

DEF A frequency region in the infrared where there is good transmission of electromagnetic radiation through the atmosphere.  
RT apertures  
lasers  
optical materials  
∞ windows

### infrasonic frequencies

DEF Frequencies below the audiofrequency range.  
GS frequencies  
. **infrasonic frequencies**  
RT acoustics

### ∞ ingestion

SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW.)  
RT ingestion (biology)

ingestion (engines)

### ingestion (biology)

GS **ingestion (biology)**  
. drinking  
. eating  
. grazing  
RT ∞ ingestion  
swallowing

### ingestion (engines)

RT bird-aircraft collisions  
engine failure  
∞ ingestion

### ingots

DEF Cast metals in forms intended for subsequent fabrication.  
GS castings  
. **ingots**  
RT billets  
casting  
molds  
solidification

### ingredients

RT admixtures  
∞ components  
∞ composition  
content  
formulations  
mixtures

### ingress (spacecraft passageway)

RT air locks  
doors  
egress  
hatches  
openings

### inhabitants

GS communities  
. **inhabitants**  
. . mountain inhabitants  
RT aborigines  
cities  
demography  
personnel  
residential areas

### inhalation

USE **respiration**

### ∞ inhibition

SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))  
RT attenuation  
corrosion prevention  
detachment  
disabilities  
diathers  
frustration  
inhibition (psychology)  
inhibitors  
introversion  
lethargy  
passivity  
prevention  
∞ reduction  
stopping

### inhibition (psychology)

RT conditioning (learning)  
∞ inhibition

### inhibitors

DEF Things that inhibit, specifically, substances bonded, taped, or dip dried onto a solid propellant to restrict the burning surface and to give direction to the burning process.

GS **inhibitors**  
. enzyme inhibitors  
. wear inhibitors  
RT additives  
antidotes  
antifouling  
anticicing additives  
antioxidants  
case bonded propellants  
catalysts

coatings  
corrosion prevention  
∞ inhibition  
neutralizers  
packaging  
passivity  
propellant additives  
propellant decomposition  
propellant storability  
retardants  
silencers  
solid propellant ignition  
solid propellants  
suppressors

### inhomogeneity

UF *nonhomogeneity*  
RT defects  
heterogeneity  
nonuniformity

### inhour equation

RT ∞ equations  
nuclear reactions  
nuclear reactors  
reactivity  
reactor physics

### initial value problems

USE **boundary value problems**

### initialisms

USE **abbreviations**

### initiation

RT activation  
actuation  
detonation  
∞ generation  
∞ induction  
inoculation  
nucleation  
∞ priming  
reactor startup tests  
starting  
stimulation

### ∞ initiators

SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))  
RT catalysts  
initiators (explosives)  
stypnates

### initiators (explosives)

UF *electroexplosive devices*  
GS explosive devices  
. **initiators (explosives)**  
. . boosters (explosives)  
. . caps (explosives)  
. . detonators  
. . exploding wires  
. . primers (explosives)  
igniters  
. **initiators (explosives)**  
. . boosters (explosives)  
. . caps (explosives)  
. . detonators  
. . exploding wires  
. . primers (explosives)  
RT fuses (ordnance)  
∞ initiators  
pyrotechnics  
stypnates

### injection

GS **injection**  
. carrier injection  
. fluid injection  
. gas injection  
. liquid injection  
. . deep well injection (wastes)  
. . water injection  
. fuel injection  
. ion injection  
. secondary injection  
. transearth injection  
. translunar injection  
RT Barritt diodes  
blowing

boundary layer separation  
 ∞ charging  
 feeding (supplying)  
 filling  
 fluid flow  
 implantation  
 injectors  
 input  
 perforating  
 supplying

*injection carburetors*  
 USE **carburetors**  
**fuel injection**

**injection guidance**  
 GS guidance (motion)  
 . **injection guidance**  
 RT ascent trajectories  
 celestial navigation  
 command guidance  
 inertial guidance  
 midcourse guidance  
 rendezvous guidance  
 satellite guidance  
 spacecraft guidance  
 transearth injection  
 translunar injection

**injection lasers**  
 DEF Lasers that use a forward biased semiconductor junction as the active lasing medium.  
 GS stimulated emission devices  
 . lasers  
 . . **injection lasers**  
 . . . quantum cascade lasers  
 RT aluminum gallium arsenide lasers  
 gallium arsenide lasers  
 gallium arsenides  
 injection locking  
 semiconductor lasers

**injection locking**  
 RT carrier injection  
 injection lasers  
 laser mode locking

**injection molding**  
 DEF A forming process in which a heat softened or plasticized material is forced from a cylinder into a relatively cool cavity which gives the product a desired shape. A similar process is used for forming solid propellants from quick cure ingredients.  
 GS forming techniques  
 . **injection molding**  
 RT ceramics  
 dies  
 extruding  
 melting  
 molding materials  
 molds  
 plastics  
 resin transfer molding

**injectors**  
 DEF Devices that propel fuel or propellant into a combustion chamber under pressure other than atmospheric.  
 GS **injectors**  
 . vortex injectors  
 RT blowers  
 carburetors  
 ejectors  
 feeders  
 fuel injection  
 fuel systems  
 injection  
 jet flow  
 jet mixing flow  
 ∞ jet nozzles  
 ∞ jets  
 nozzle flow  
 ∞ nozzles  
 orifices  
 pumps  
 spray nozzles

**Injun 1 satellite**  
 GS artificial satellites

. Injun satellites  
 . . **Injun 1 satellite**

**Injun 3 satellite**  
 GS artificial satellites  
 . Injun satellites  
 . . **Injun 3 satellite**

**Injun 4 satellite**  
 GS artificial satellites  
 . Injun satellites  
 . . **Injun 4 satellite**

*Injun 5 satellite*  
 USE **Explorer 40 satellite**

*Injun Explorer*  
 USE **Explorer 25 satellite**

**Injun satellites**  
 GS artificial satellites  
 . **Injun satellites**  
 . . Explorer 25 satellite  
 . . Injun 1 satellite  
 . . Injun 3 satellite  
 . . Injun 4 satellite

**injuries**  
 GS **injuries**  
 . back injuries  
 . barotrauma  
 . brain damage  
 . burns (injuries)  
 . crash injuries  
 . ejection injuries  
 . frostbite  
 . lesions  
 . . pulmonary lesions  
 . noise injuries  
 . parachuting injury  
 . paralysis  
 . radiation injuries  
 . spinal cord injuries  
 . whiplash injuries  
 RT accidents  
 ∞ blisters  
 chemical defense  
 damage  
 death  
 diagnosis  
 foreign bodies  
 hazards  
 hemorrhages  
 impairment  
 necrosis  
 sabotage  
 veterinary medicine  
 wound healing

**inks**  
 RT drawings  
 graphic arts  
 pigments  
 printing

**inland waters**  
 GS water  
 . **inland waters**  
 . . ground water  
 RT Great Lakes (North America)  
 Great Salt Lake (UT)  
 lakes  
 rivers  
 springs (water)  
 water pollution  
 water resources  
 water runoff

**inlet airframe configurations**  
 DEF Optimum locations of engine inlets for various purposes.  
 GS intake systems  
 . air intakes  
 . . **inlet airframe configurations**  
 RT bypass ratio  
 engine inlets  
 flow geometry  
 hypersonic inlets  
 inlet flow  
 inlet nozzles

nose inlets  
 side inlets  
 supersonic inlets

**inlet flow**  
 GS fluid flow  
 . internal flow  
 . . **inlet flow**  
 RT bypass ratio  
 choked flow  
 ∞ diffusers  
 dump combustors  
 flow geometry  
 fluid injection  
 head flow  
 inlet airframe configurations  
 intake systems  
 ∞ pressure drop  
 supersonic inlets  
 vortex generators

**inlet nozzles**  
 RT air intakes  
 annular nozzles  
 bypass ratio  
 conical nozzles  
 ∞ diffusers  
 engine inlets  
 exhaust nozzles  
 inlet airframe configurations  
 intake systems  
 internal compression inlets  
 ∞ nozzles  
 openings  
 pipe nozzles

**inlet pressure**  
 DEF In connection with performance data on pumps, when not otherwise specified, the total static pressure measured in a standard testing chamber by a vacuum gage located near the inlet port.  
 GS pressure  
 . **inlet pressure**  
 RT pressure gradients  
 pressure recovery  
 stagnation pressure  
 water pressure

**inlet temperature**  
 DEF A location for measuring the temperature of fluids, particles, etc., entering a heat system, an engine, or other machine.  
 GS temperature  
 . **inlet temperature**  
 RT air intakes  
 engine inlets  
 fuel systems  
 gas temperature  
 intake systems

*inlets (devices)*  
 USE **intake systems**

**inlets (topography)**  
 DEF Small narrow openings, recesses, indentations, or other entrances into coastlines or shores of lakes or rivers, through which water penetrates into land.  
 GS landforms  
 . **inlets (topography)**  
 . . bayous  
 . . Cook Inlet (AK)  
 RT bays (topographic features)  
 Delaware Bay (US)  
 fiords  
 gulfs  
 lagoons  
 Persian Gulf  
 Saginaw Bay (MI)  
 sounds (topographic features)

**inliers (landforms)**  
 DEF Areas or groups of rocks surrounded by rocks of younger age.  
 GS landforms  
 . **inliers (landforms)**  
 RT erosion  
 geological faults  
 geology

## INMARSAT satellites

- petrography
- petrology
- rock intrusions
- rocks
- structural properties (geology)

### INMARSAT satellites

(added September 1994)

- GS artificial satellites
  - . **INMARSAT satellites**
- RT communication satellites
- international cooperation
- Marisat satellites
- NAVSTAR satellites
- telecommunication

### inner radiation belt

- GS environments
  - . **inner radiation belt**
  - particles
    - . charged particles
    - . . . magnetically trapped particles
    - . . . radiation belts
    - . . . . **inner radiation belt**
    - . . . corpuscular radiation
    - . . . radiation belts
    - . . . . **inner radiation belt**
    - . . . trapped particles
    - . . . magnetically trapped particles
    - . . . radiation belts
    - . . . . **inner radiation belt**
- RT artificial radiation belts
- outer radiation belt
- proton belts
- ∞ radiation
- single event upsets

### inoculation

- UF *seeding (inoculation)*
- RT crystal growth
- crystallization
- immunity
- initiation
- nucleation
- vaccines

### inoculum

- GS serums
  - . **inoculum**
  - vaccines
    - . **inoculum**
- RT antibodies
- antigens
- physiological defenses

### inorganic chemistry

DEF The study of the composition, properties, structure, and reactions of the chemical elements and all their compounds with the exception of hydrocarbons and their derivatives.

- RT analytical chemistry
- ∞ chemistry

### inorganic coatings

- GS coatings
  - . **inorganic coatings**
  - . . . anodic coatings
  - . . . ceramic coatings
- RT antiradar coatings
- protective coatings

### inorganic compounds

- GS **inorganic compounds**
  - . ammonia
  - . . . liquid ammonia
- RT acids
- ∞ bases
- ∞ chemical compounds
- flame retardants
- intermetallics
- molten salts
- ∞ salts

### ∞ inorganic materials

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED CONSULT THE TERMS LISTED BELOW)
- RT ∞ materials
  - nonflammable materials
  - refractory materials
  - thermochromatic materials

- vitreous materials

### inorganic nitrates

- GS nitrogen compounds
  - . nitrates
  - . . **inorganic nitrates**
  - . . . ammonium nitrates
  - . . . hydrazine nitrate
  - . . . potassium nitrates
  - . . . silver nitrates
  - . . . sodium nitrates

### inorganic peroxides

- UF *superoxides*
- GS chalcogenides
  - . oxides
  - . . anhydrides
  - . . . peroxides
  - . . . . **inorganic peroxides**
  - . . . . . hydrogen peroxide
- RT organic peroxides

### inorganic sulfides

- GS chalcogenides
  - . sulfides
  - . . **inorganic sulfides**
  - . . . barium sulfides
  - . . . bismuth sulfides
  - . . . cadmium sulfides
  - . . . calcium sulfides
  - . . . copper sulfides
  - . . . hydrogen sulfide
  - . . . indium sulfides
  - . . . lead sulfides
  - . . . molybdenum sulfides
  - . . . . molybdenum disulfides
  - . . . polysulfides
  - . . . strontium sulfides
  - . . . zinc sulfides
  - . . . . wurtzite
  - . . . . zincblende
  - sulfur compounds
    - . sulfides
    - . . **inorganic sulfides**
    - . . . barium sulfides
    - . . . bismuth sulfides
    - . . . cadmium sulfides
    - . . . calcium sulfides
    - . . . copper sulfides
    - . . . hydrogen sulfide
    - . . . indium sulfides
    - . . . lead sulfides
    - . . . molybdenum sulfides
    - . . . . molybdenum disulfides
    - . . . polysulfides
    - . . . strontium sulfides
    - . . . zinc sulfides
    - . . . . wurtzite
    - . . . . zincblende

### inositols

- GS organic compounds
  - . carbohydrates
  - . . sugars
  - . . . **inositols**

### input

- RT accumulations
- collection
- feeding (supplying)
- filling
- injection
- ∞ loading
- output
- reading
- replenishment
- supplying

### input/output routines

- GS computer programs
  - . computer systems programs
  - . . **input/output routines**
- RT data transfer (computers)
- disk operating system (DOS)
- operating systems (computers)
- random access

- ∞ routines

### INSAT satellites

- USE **Indian spacecraft**

### insect damage

- USE **infestation**

### insecticides

- GS poisons
  - . pesticides
  - . . **insecticides**
  - . . . Carbamates (tradename)
  - . . . . urethanes
  - . . . DDT
  - . . . dieldrin
  - . . . phenothiazines
- RT endrin
- entomology
- toxicology

### insects

- GS animals
  - . invertebrates
  - . . arthropods
  - . . . **insects**
  - . . . . bees
  - . . . . . bollworms
  - . . . . . chironomus flies
  - . . . . . cockroaches
  - . . . . . Coleoptera
  - . . . . . beetles
  - . . . . . . tribolia
  - . . . . . boll weevils
  - . . . . . crickets
  - . . . . . Drosophila
  - . . . . . fireflies
  - . . . . . grasshoppers
  - . . . . . locusts
  - . . . . . moths
  - . . . . . . silkworms
- RT entomology
- infestation
- larvae
- pupa

### insensitivity

- USE **sensitivity**

### insertion

- GS **insertion**
  - . orbit insertion
- RT collating
- embedding
- grafting
- implantation
- impregnating
- inserts
- network analysis
- transmission loss

### insertion loss

- RT energy dissipation
- losses
- transmission loss

### inserts

- GS **inserts**
  - . nozzle inserts
- RT accessories
- bushings
- fasteners
- fittings
- insertion
- linings
- spacers
- spools
- washers (spacers)

### inshore zones

- USE **beaches**

### insolation

DEF In general, solar radiation received at the Earth's surface. The rate at which direct solar radiation is incident upon a unit horizontal surface at any point on or above the surface of Earth. (Contracted from INcoming SOLar radiATION).

- GS solar energy

. **insolation**  
 RT greenhouse effect  
 meteorology  
 photosynthetically active radiation  
 solar heating  
 solar radiation  
 sunlight  
 Surface Meteorology and Solar Energy project

**insomnia**  
 GS sleep  
 . **insomnia**  
 RT sleep deprivation

**inspection**  
 DEF The process of measuring, examining, testing, gaging, or making other determinations with respect to materials, products, services, systems, or environments.  
 GS **inspection**  
 . infrared inspection  
 . x ray inspection  
 RT acceptability  
 checkout  
 chemical tests  
 construction  
 detection  
 endoscopes  
 evaluation  
 examination  
 identifying  
 nondestructive tests  
 performance tests  
 preventive maintenance  
 quality control  
 sampling  
 specifications  
 standards  
 static tests  
 statistical analysis  
 surveillance  
 tolerances (mechanics)  
 ultrasonic flaw detection

**Inspector satellite**  
 GS artificial satellites  
 . **Inspector satellite**  
 military spacecraft  
 . reconnaissance spacecraft  
 . . **Inspector satellite**

**inspiration**  
 RT intellect  
 mental performance  
 psychology

*instability*  
 USE **stability**

*installation*  
 USE **installing**

**installation manuals**  
 GS documents  
 . manuals  
 . . **installation manuals**

**installing**  
 UF *installation*  
 RT assembling  
 construction  
 look angles (electronics)  
 maintenance  
 relocation  
 replacing  
 retrofitting

**instantons**  
 DEF Field configurations of Yang-Mills theory which are localized in space and time. These configurations are solutions of the Yang-Mills field equations in Euclidean space time which allow the transitions (tunneling) from one vacuum state to another.  
 RT elementary particles  
 plasma physics  
 quantum chromodynamics

quarks

**institutions**  
 GS **institutions**  
 . bureaus (organizations)  
 RT federations  
 teams

**instruction sets (computers)**  
 RT alphanumeric characters  
 Boolean algebra  
 computer programs  
 mathematical logic

*instructions*  
 USE **education**

**instructors**  
 UF *teachers*  
 GS personnel  
 . **instructors**  
 RT education  
 learning  
 schools  
 students  
 training evaluation  
 universities

**instrument approach**  
 DEF A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

GS approach  
 . **instrument approach**  
 RT aircraft approach spacing  
 aircraft instruments  
 approach control  
 approach indicators  
 blind landing  
 flight control  
 flight instruments  
 glide paths  
 landing aids  
 landing radar  
 night flights (aircraft)

**instrument compensation**  
 GS **instrument compensation**  
 . temperature compensation  
 RT adaptive optics  
 calibrating  
 ∞ compensation  
 error correcting devices  
 laser guide stars  
 systematic errors

*instrument drift*  
 USE **drift (instrumentation)**

**instrument errors**  
 GS errors  
 . **instrument errors**  
 RT bias  
 boresight error  
 calibrating  
 drift (instrumentation)  
 linearity  
 optical correction procedure  
 spectral sensitivity  
 systematic errors

**instrument flight rules**  
 UF *IFR (rules)*  
 GS rules  
 . flight rules  
 . . **instrument flight rules**  
 RT air navigation  
 air traffic control  
 approach control  
 beacons  
 blind landing  
 flight conditions  
 flight instruments  
 flight plans  
 landing

low visibility

**instrument landing systems**  
 DEF A system which provides, in the aircraft, a display of the lateral, longitudinal, and vertical references necessary for a landing. Used for ILS (landing systems).

UF *ILS (landing systems)*  
 GS landing aids  
 . **instrument landing systems**  
 . . all-weather landing systems  
 RT air traffic control  
 aircraft guidance  
 aircraft instruments  
 aircraft landing  
 airports  
 approach control  
 approach indicators  
 automatic landing control  
 blind landing  
 display devices  
 flight control  
 flight instruments  
 glide paths  
 ground based control  
 ∞ instruments  
 landing  
 landing instruments  
 night flights (aircraft)  
 radar  
 radar approach control  
 radio altimeters  
 radio beacons  
 ∞ systems  
 tracking (position)

**instrument orientation**  
 RT alignment  
 attitude (inclination)  
 bearing (direction)  
 directivity  
 look angles (electronics)  
 ∞ orientation  
 positioning

**instrument packages**  
 GS packages  
 . **instrument packages**  
 . . Apollo Lunar Surface Experiments Package  
 . . EASEP  
 . . EREP  
 RT AMPS (satellite payload)  
 automatic weather stations  
 data collection platforms  
 local scientific survey module  
 modules  
 molecular shields  
 ocean data acquisitions systems  
 Orbiting Frog Otolith  
 payload assist module  
 payloads  
 satellite-borne instruments  
 SIM  
 spacecraft instruments  
 weather stations

**instrument receivers**  
 RT controllers  
 ∞ detectors  
 display devices  
 indicating instruments  
 ∞ instruments  
 isotropic turbulence  
 measuring instruments  
 receivers  
 recording instruments  
 transducers

**instrument transformers**  
 GS transformers  
 . **instrument transformers**  
 RT ∞ converters  
 resolvers

**instrument transmitters**  
 GS transmitters  
 . **instrument transmitters**  
 RT controllers  
 ∞ instruments

## instruments

measuring instruments  
recording instruments  
transducers

### *instrumental analysis*

USE **analyzing**  
**automation**

### *instrumentation*

USE **instruments**

### ∞ **instruments**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *instrumentation*  
RT actuators  
Advanced Range Instrumentation Ship  
aircraft instruments  
Apollo Lunar Surface Experiments Package  
automatic control  
bioinstrumentation  
bubble technique  
controllers  
densimeters  
display devices  
drag force anemometers  
EASEP  
EREP  
flight instruments  
force vector recorders  
haploscopes  
heliostats  
helmet mounted displays  
indicating instruments  
instrument landing systems  
instrument receivers  
instrument transmitters  
laser altimeters  
measuring instruments  
meteorological instruments  
microwave sensors  
monitors  
navigation instruments  
oculometers  
packages  
propellant actuated instruments  
recording instruments  
remote control  
rocket-borne instruments  
satellite instruments  
satellite-borne instruments  
scatterometers  
SIM  
sound detecting and ranging  
spacecraft instruments  
surgical instruments  
transducers  
transmitters  
tribometers  
turbine instruments  
ultrasonic densimeters

### ∞ **insulated structures**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT dielectrics  
electrical insulation  
heat radiators  
heat shielding  
hypersonic vehicles  
insulation  
radiation shielding  
reentry shielding  
reentry vehicles  
spacecraft shielding

### *insulating materials*

USE **insulation**

### **insulation**

SN (MATERIAL)  
UF *insulating materials*  
GS **insulation**  
. electrical insulation  
. multilayer insulation  
. thermal insulation  
RT absorbers (materials)

asbestos  
ceilings (architecture)  
composite materials  
concretes  
∞ construction materials  
damping  
honeycomb structures  
∞ insulated structures  
insulators  
interlayers  
isolation  
isolators  
jackets  
lining processes  
linings  
∞ materials  
micarta  
oxides  
potting compounds  
protection  
suppressors  
vermiculite  
waterproofing

### **insulators**

SN (EXCLUDES THERMAL INSULATION--LIMITED TO DEVICES COMPOSED OF ELECTRICALLY INSULATIVE MATERIALS)  
RT attenuators  
dielectrics  
electric conductors  
electrical insulation  
insulation  
transmission lines

### **insulin**

GS drugs  
. **insulin**  
secretions  
. endocrine secretions  
. **insulin**  
RT diabetes mellitus

### **insurance (contracts)**

DEF Coverage by contract whereby one party undertakes to indemnify or guarantee another against loss by a specified contingency or peril.  
GS contracts  
. **insurance (contracts)**  
RT agreements  
air law  
aircraft accident investigation  
aircraft accidents  
assurance  
economic factors  
extensions  
grants  
legal liability  
public law  
space commercialization  
space law

### **intake systems**

UF *induction systems*  
*inlets (devices)*  
GS **intake systems**  
. air intakes  
. engine inlets  
. hypersonic inlets  
. inlet airframe configurations  
. supersonic inlets  
. conical inlets  
. helical inducers  
. internal compression inlets  
. nose inlets  
. side inlets  
RT aerodynamic configurations  
annular ducts  
bypass ratio  
cooling systems  
duct geometry  
ducted bodies  
ducts  
entrances  
exhaust systems  
feed systems  
feeders  
fuel systems  
inlet flow

inlet nozzles  
inlet temperature  
manifolds  
openings  
pipe nozzles  
plenum chambers  
ramps (structures)  
scoops  
∞ systems  
∞ water intakes

### **Intasat satellite**

GS artificial satellites  
. scientific satellites  
. . Environmental Research Satellites  
. . . **Intasat satellite**  
RT Earth ionosphere  
lower atmosphere  
magnetic fields  
troposphere

### *Integ Med and Behavioral Lab Measur System*

USE **IMBLMS**

### *Integ Program for Aerospace Veh Design*

USE **IPAD**

### **integers**

DEF Whole numbers; numbers that are not a fraction.  
GS number theory  
. **integers**  
real numbers  
. **integers**  
RT arithmetic  
complex numbers  
congruences  
digits  
∞ numbers

### **integral calculus**

GS analysis (mathematics)  
. calculus  
. . **integral calculus**  
. real variables  
. . measure and integration  
. . . **integral calculus**  
RT area  
differential calculus  
integrals  
J integral  
numerical integration  
operational calculus

### **integral equations**

UF *integrodifferential equations*  
GS analysis (mathematics)  
. functional analysis  
. . **integral equations**  
. . . Fredholm equations  
. . . J integral  
. . . singular integral equations  
. . . Volterra equations  
. . . Wiener Hopf equations  
RT asymptotic properties  
calculus of variations  
differential equations  
distributed parameter systems  
∞ equations  
ill-conditioned problems  
(mathematics)  
ill-posed problems (mathematics)  
Mellin transforms  
meshfree methods  
method of moments  
nonlinear equations  
Percus method  
range (extremes)  
Schmidt method  
transport theory

### *integral functions*

USE **entire functions**

### **integral rocket ramjets**

DEF A combination of a solid propellant rocket and a ramjet which uses the empty booster case as a ramjet combustor.  
GS engines  
. air breathing engines

. . gas turbine engines  
 . . . jet engines  
 . . . . ramjet engines  
 . . . . . **integral rocket ramjets**  
 . internal combustion engines  
 . . gas turbine engines  
 . . . jet engines  
 . . . . ramjet engines  
 . . . . . **integral rocket ramjets**  
 . turbine engines  
 . . gas turbine engines  
 . . . jet engines  
 . . . . ramjet engines  
 . . . . . **integral rocket ramjets**  
 RT rocket-based combined-cycle engines  
 solid propellant rocket engines  
 turbine engines

### integral transformations

UF *transform integrals*  
 GS analysis (mathematics)  
 . functional analysis  
 . . **integral transformations**  
 . . . Fourier transformation  
 . . . . fast Fourier transformations  
 . . . Fourier-Bessel transformations  
 . . . Hilbert transformation  
 . . . Laplace transformation  
 transformations (mathematics)  
 . **integral transformations**  
 . . Fourier transformation  
 . . . fast Fourier transformations  
 . . Fourier-Bessel transformations  
 . . Hilbert transformation  
 . . Laplace transformation  
 RT convolution integrals  
 Lighthill method  
 operators (mathematics)

### integrals

DEF Of or pertaining to an integer.  
 GS **integrals**  
 . convolution integrals  
 RT differential equations  
 functionals  
 integral calculus  
 ∞ mathematics

### integrated circuits

DEF Combinations of interconnected circuit elements inseparably associated on or within continuous substrates. To further define the nature of integrated circuits, additional modifiers may be prefixed.  
 UF *monolithic circuits*  
 GS circuits  
 . **integrated circuits**  
 . . application specific integrated circuits  
 . . DTL integrated circuits  
 . . encapsulated microcircuits  
 . . field-programmable gate arrays  
 . . large scale integration  
 . . linear integrated circuits  
 . . medium scale integration  
 . . TTL integrated circuits  
 . . very large scale integration  
 . . VHSIC (circuits)  
 RT burn-in  
 charge flow devices  
 chips (electronics)  
 chips (memory devices)  
 electronic packaging  
 evolvable hardware  
 hardware description languages  
 integrated optics  
 ion implantation  
 latch-up  
 microchannel plates  
 microminiaturization  
 microprocessors  
 microstrip devices  
 molecular electronics  
 optoelectronic devices  
 photomasks  
 photoresists  
 printed circuits  
 reconfigurable hardware  
 resonant tunneling diodes  
 thick films

thin films  
 transistor circuits

### integrated energy systems

DEF Community systems for energy generation and distribution.  
 RT communities  
 electric power plants  
 energy conversion  
 energy distribution  
 heating  
 ∞ systems  
 total energy systems  
 utilities

### integrated global ocean station systems

UF *IGOSS*  
 RT data collection platforms  
 Global Atmospheric Research Program  
 ground stations  
 international cooperation  
 oceanographic parameters  
 ∞ systems  
 weather stations

### integrated library systems

GS information systems  
 . **integrated library systems**  
 RT information dissemination  
 information management  
 information retrieval  
 libraries  
 on-line systems

### Integrated Maneuvering Life Support Sys

USE **IMLSS**

### integrated mission control center

UF *IMCC (control center)*  
 GS stations  
 . ground stations  
 . . **integrated mission control center**  
 RT ∞ control  
 Gemini project  
 ground based control  
 real time operation

### integrated optics

DEF Thin film devices containing tiny lenses, prisms, and switches to transmit very thin laser beams, which serve the same purposes as the manipulation of electrons in thin film devices of integrated electronics.  
 RT electro-optics  
 free-space optical interconnects  
 integrated circuits  
 Langmuir-Blodgett films  
 lenses  
 light transmission  
 monomolecular films  
 optical bistability  
 optical interconnects  
 optical switching  
 optical waveguides  
 ∞ optics  
 optoelectronic devices  
 thin films

### Integrated Truss Structure P1

(added November 2002)

DEF A structural component of the International Space Station incorporating elements of the External Active Thermal Control Subsystem, the UHF-band communications subsystem, and portions of the rail system for the Mobile Servicing System.

GS space station structures  
 . **Integrated Truss Structure P1**  
 RT International Space Station  
 large space structures  
 trusses

### Integrated Truss Structure S1

(added October 2002)

DEF A structural component of the International Space Station incorporating elements of the External Active Thermal Control Subsystem, the S-band communications subsystem, and

portions of the rail system for the Mobile Servicing System.

GS space station structures  
 . **Integrated Truss Structure S1**  
 RT International Space Station  
 large space structures  
 trusses

### Integrated Truss Structure Z1

(added June 2000)

DEF An early exterior framework for the International Space Station to allow the first U.S. solar arrays to be temporarily installed on the Unity module for early power.

UF *Z1 truss structure*  
 GS space station structures  
 . **Integrated Truss Structure Z1**  
 RT International Space Station  
 trusses  
 Unity connecting module

### integration (real variables)

USE **measure and integration**

### integrators

DEF In digital computers, devices for accomplishing a numeric approximation of the mathematical process of integration. Devices whose output is proportional to the integral of an input signal.

GS **integrators**  
 . digital integrators  
 RT circuits  
 differentiators  
 solions

### integrity

GS **integrity**  
 . computer program integrity  
 RT completeness  
 privacy  
 security  
 vulnerability

### integro-differential equations

USE **differential equations**  
**integral equations**

### Intel 8080 microprocessor

GS computer components  
 . microprocessors  
 . . **Intel 8080 microprocessor**  
 data processing equipment  
 . microprocessors  
 . . **Intel 8080 microprocessor**  
 RT computers

### intellect

GS intelligence  
 . **intellect**  
 RT artificial intelligence  
 inspiration  
 mental performance  
 psychology

### intellectual property

(added October 1995)

GS **intellectual property**  
 . copyrights  
 . patents  
 RT computer programs  
 inventions  
 law (jurisprudence)  
 legal liability  
 licensing  
 open source licensing (computers)  
 patent policy  
 procurement policy

### intelligence

GS **intelligence**  
 . artificial intelligence  
 . extraterrestrial intelligence  
 . intellect  
 RT abilities  
 cognitive psychology  
 intelligence tests  
 mental health

## intelligence tests

mental performance

### intelligence tests

(added September 1992)

RT abilities  
human performance  
intelligence  
mental performance  
personality tests  
personnel selection  
psychological tests  
∞ tests

### intelligent materials

(added March 1998)

USE **smart materials**

### intelligent structures

USE **smart structures**

### intelligibility

GS **intelligibility**  
. speech recognition  
RT ambiguity  
∞ coherence  
∞ communication theory  
∞ interpretation  
messages  
orthography  
phonemics  
phonetics  
psycholinguistics  
scrambling (communication)

### Intelsat satellites

GS artificial satellites  
. communication satellites  
. . **Intelsat satellites**

### intensification

USE **amplification**

### intensifier tubes

USE **image intensifiers**

### intensifiers

GS **intensifiers**  
. image intensifiers  
. . image orthicons  
RT amplifiers

### ∞ intensity

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF In general, the degree or amount, usually expressed by the elemental time rate or spatial distribution of some condition or physical quantity, such as electric field, sound, magnetism, etc. With respect to electromagnetic radiation, a measure of the radiant flux per unit solid angle emanating from some source. Frequently, it is desirable to specify this as radiant intensity in order to distinguish it clearly from luminous intensity.

RT amplitudes  
brightness  
flux (rate)  
flux density  
level (quantity)  
loudness  
luminance  
luminous intensity  
magnitude  
noise intensity  
radiance  
stellar magnitude

### interacting galaxies

(added November 1988)

UF *galaxy interaction*  
GS celestial bodies  
. galaxies  
. . **interacting galaxies**  
RT galactic structure  
∞ interactions  
retrograde orbits  
ring galaxies  
shell galaxies

stellar systems

### interactional aerodynamics

GS mechanics (physics)  
. fluid mechanics  
. . fluid dynamics  
. . . gas dynamics  
. . . . **interactional aerodynamics**  
RT airfoils  
blade-vortex interaction  
computational fluid dynamics  
∞ flow  
laminar boundary layer  
rotor stator interactions  
shock wave interaction

### ∞ interactions

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air land interactions  
air sea ice interactions  
air water interactions  
atomic collisions  
atomic interactions  
beam interactions  
blade-vortex interaction  
configuration interaction  
electromagnetic interactions  
electron phonon interactions  
electroweak interactions (field theory)  
elementary particle interactions  
fluid-solid interactions  
gas-gas interactions  
gas-ion interactions  
gas-liquid interactions  
gas-metal interactions  
gas-solid interactions  
high energy interactions  
interacting galaxies  
ion atom interactions  
laser plasma interactions  
laser target interactions  
man environment interactions  
meson-meson interactions  
meson-nucleon interactions  
molecular collisions  
molecular interactions  
nuclear capture  
nuclear interactions  
nuclear reactions  
nucleon-nucleon interactions  
particle interactions  
particle theory  
photon-electron interaction  
plasma interaction experiment  
plasma interactions  
plasma-electromagnetic interaction  
plasma-particle interactions  
proton-proton reactions  
shock wave interaction  
solar terrestrial interactions  
sound-sound interactions  
spin-orbit interactions  
strong interactions (field theory)  
wave interaction  
weak energy interactions  
weak interactions (field theory)

### interactive control

DEF The sending of multiple commands that are selected on the basis of data received from an experiment in real time.

RT active control  
∞ control  
control theory  
numerical control

### interactive graphics

USE **computer graphics**

### interactive multimedia

USE **multimedia**

### interannual variations

(added September 2000)

USE **annual variations**

### interatomic forces

RT atomic force microscopy  
atomic structure

embedded atom method

lattice energy  
Van der Waals forces

### intercalation

DEF Production of layer type semiconducting as well as other conducting materials (also called synthetic metals).

GS stratification  
. **intercalation**  
RT ∞ chemical compounds  
graphite  
interlayers  
∞ layers

### intercalibration

(added January 1999)

DEF Calibration between two or more data sources, including (1) the comparison of data sets acquired by different types of measurement systems for the purpose of deducing the calibration values for one of the measurement systems; (2) the mutual calibration of data from different measurement systems through the comparison of the data with model calculations; and (3) the calibration of multiple detectors on a single instrument through the comparison of data from each detector.

GS calibrating  
. **intercalibration**  
RT comparison  
correction  
multisensor applications  
standardization

### interception

RT autonomous docking  
docking  
proportional navigation  
pursuit-evasion games  
rendezvous  
spacecraft docking

### Interceptor aircraft

USE **fighter aircraft**

### ∞ interceptors

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT fighter aircraft  
satellite interceptors  
YF-12 aircraft

### interconnection

USE **joining**

### intercontinental ballistic missiles

UF *ICBM (missiles)*  
GS missiles  
. ballistic missiles  
. . **intercontinental ballistic missiles**  
. . . Atlas ICBM  
. . . . Atlas D ICBM  
. . . . Atlas E ICBM  
. . . . Atlas F ICBM  
. . . Minuteman ICBM  
. . . MX missile  
. . . Titan ICBM  
. . . . Titan 1 ICBM  
. . . . Titan 2 ICBM  
. surface to surface missiles  
. . **intercontinental ballistic missiles**  
. . . Atlas ICBM  
. . . . Atlas D ICBM  
. . . . Atlas E ICBM  
. . . . Atlas F ICBM  
. . . Minuteman ICBM  
. . . MX missile  
. . . Titan ICBM  
. . . . Titan 1 ICBM  
. . . . Titan 2 ICBM  
RT fleet ballistic missiles  
intermediate range ballistic missiles  
Mark 1 reentry body  
Mark 2 reentry body  
Mark 3 reentry body  
Mark 4 reentry body  
Mark 5 reentry body  
Mark 6 reentry body  
Mark 11 reentry body

Mark 12 reentry body  
Mark 17 reentry body  
transoceanic systems

**Intercosmos satellites**

GS artificial satellites  
. geophysical satellites  
. . . Cosmos satellites  
. . . **Intercosmos satellites**  
. Soviet satellites  
. . . Cosmos satellites  
. . . **Intercosmos satellites**

**intercranial circulation**

GS circulation  
. blood circulation  
. . . **intercranial circulation**

RT cranium  
skull

**interdigital transducers**

GS transducers  
. **interdigital transducers**

RT digital transducers  
electroacoustic transducers  
piezoelectric transducers  
surface acoustic wave devices

**interface stability**

GS stability  
. **interface stability**

RT fluid boundaries  
gas-solid interfaces  
interfaces  
liquid sloshing  
liquid-liquid interfaces  
liquid-solid interfaces  
liquid-vapor interfaces  
Taylor instability  
ullage

**interfaces**

DEF A common boundary between two parts of a system, whether material or non material. Specifically, in a rocket vehicle or other mechanical assembly, a common boundary between two components. Specifically, in fluid dynamics, a surface separating two fluids across which there is a discontinuity of some fluid property such as density or velocity or of some derivative of these properties in a direction normal to the interface. The equations of motion do not apply at the interface but are replaced by the boundary conditions.

GS **interfaces**  
. fiber-matrix interfaces  
. fluid boundaries  
. . gas-solid interfaces  
. . jet boundaries  
. . liquid-liquid interfaces  
. . liquid-solid interfaces  
. . liquid-vapor interfaces  
. graphical user interface  
. . windows (computer programs)  
. human-computer interface  
. solid-solid interfaces

RT boundaries  
coordination  
data processing equipment  
free boundaries  
interface stability  
management planning  
project management  
surface properties  
surface reactions

∞ surfaces  
telecommunication

**interfacial energy**

RT adhesion  
antiphase boundaries  
electron energy

∞ energy  
fiber pullout  
fiber pushout  
fiber-matrix interfaces  
liquid-liquid interfaces  
shear strength  
stiction

surface energy

*interfacial strain*

USE **interfacial tension**

**interfacial tension**

DEF That property, due to molecular forces, that exists in the surface film of all liquids and tends to prevent the liquid from spreading. Used for interfacial strain and surface tension.

UF *interfacial strain*  
*surface tension*

GS surface properties  
. **interfacial tension**

RT Bond number  
capillary waves  
gas-liquid interactions  
Gibbs adsorption equation  
globules  
liquid bridges  
liquid surfaces  
liquid-liquid interfaces  
Marangoni convection  
mechanical properties  
ripples  
sliding  
spreading  
surface energy  
surface stability  
surface tension driven convection

∞ surfaces  
tensile stress

∞ tension  
thermocapillary migration  
tribology  
vapor pressure  
wetting

∞ **interference**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT aerodynamic interference  
coherence coefficient  
crosstalk  
disrupting  
electromagnetic compatibility  
electromagnetic interference  
hum  
incompatibility  
interference factor table  
interference grating  
intersymbolic interference  
jamming  
nonsynchronization  
radio frequency interference  
Ramsauer effect  
support interference  
wave diffraction  
wave front deformation

**interference drag**

GS aerodynamic characteristics  
. **interference drag**  
dynamic characteristics  
. drag  
. . pressure drag  
. . . wave drag  
. . . . **interference drag**

RT propeller slipstreams  
supersonic drag  
upwash

**interference factor table**

GS tables (data)  
. **interference factor table**

RT ∞ interference  
modulation  
multichannel communication

**interference fit**

DEF The condition where the diameter of the fastener is larger than the hole that it is to fit in.

GS joints (junctions)  
. **interference fit**

RT aircraft structures  
fasteners  
fatigue life  
fitting  
mechanical properties

stress analysis

**interference grating**

RT fringe multiplication  
∞ gratings  
∞ interference  
Moire effects  
Moire fringes  
radio filters  
radio frequency interference

**interference immunity**

RT electromagnetic interference  
noise reduction  
radio frequency interference  
signal processing  
signal to noise ratios  
space-time adaptive processing

**interference lift**

GS aerodynamic characteristics  
. lift  
. . **interference lift**  
aerodynamic forces  
. lift  
. . **interference lift**  
distribution (property)  
. **interference lift**  
dynamic characteristics  
. lift  
. . **interference lift**

RT upwash

*interference monochromatization*

USE **diffraction monochromatization**

*interferograms*

USE **interferometry**

**interferometers**

DEF Apparatus used to produce and measure interference from two or more coherent wave trains from the same source. Interferometers are used to measure wavelengths, to measure angular width of sources, to determine the angular position of sources (as in satellite tracking), and for many other purposes.

GS measuring instruments  
. **interferometers**  
. . etalons  
. . Fabry-Perot interferometers  
. . infrared interferometers  
. . Mach-Zehnder interferometers  
. . Michelson interferometers  
. . microwave interferometers  
. . phase switching interferometers  
. . radio interferometers

RT astronomical interferometry  
Bragg gratings  
diffractometers  
flatness  
goniometers  
optical equipment  
optical measurement  
optical measuring instruments  
photogoniometers  
Ronchi test  
Sagnac effect  
very long base interferometry

**interferometry**

UF *interferograms*

GS **interferometry**  
. astronomical interferometry  
. differential interferometry  
. holographic interferometry  
. laser interferometry  
. Moire interferometry  
. Ronchi test  
. shearography  
. speckle interferometry  
. very long base interferometry

RT diffraction patterns  
Fresnel diffraction  
Fresnel reflectors  
infrared interferometers  
isochromatics  
null zones  
plasma flux measurement



## interferon

Sagnac effect  
scatter plates (optics)

### interferon

DEF A protein (lymphokine) released by cells in response to virus infection. When taken up by other cells, interferon inhibits the replication of viruses within them.

RT acquired immunodeficiency syndrome  
bacteriophages  
biochemistry  
∞ biology  
human immunodeficiency virus  
physiological defenses  
viruses

### intergalactic media

UF *extragalactic media*  
GS media  
. **intergalactic media**  
RT cooling flows (astrophysics)  
cosmic dust  
cosmic gases  
cosmic plasma  
dark matter  
galactic halos  
mass distribution  
stellar winds  
Sunyaev-Zeldovich effect

### intergranular corrosion

DEF Corrosion that occurs preferentially at grain boundaries.

GS chemical attack  
. **intergranular corrosion**  
corrosion  
. **intergranular corrosion**  
RT grain boundaries  
stress corrosion  
transgranular corrosion

### interim stages (spacecraft)

GS **interim stages (spacecraft)**  
. Inertial Upper Stage  
RT multistage rocket vehicles  
recoverable spacecraft  
reusable spacecraft  
space shuttles  
stage separation

### interim upper stage (STS)

USE **Inertial Upper Stage**

### interior ballistics

DEF That branch of ballistics that deals with the propulsion of projectiles, i.e., the motion and behavior of projectiles in a gun barrel, the temperatures and pressures developed inside a gun barrel or rocket.

GS ballistics  
. **interior ballistics**  
RT propellant tests

### interlacing drainage

USE **drainage patterns**

### interlaminar stress

(added July 1992)

GS stresses  
. **interlaminar stress**  
RT composite materials  
delaminating  
interlayers  
laminates  
shear stress  
stress distribution  
stress-strain relationships

### interlayers

GS **interlayers**  
. multilayer insulation  
RT barrier layers  
fabrics  
insulation  
intercalation  
interlaminar stress  
laminates  
∞ layers  
ply orientation  
sandwich structures

∞ transition layers

### interleukins

(added August 2004)

DEF Soluble factors which stimulate growth-related activities of leukocytes as well as other cell types. They enhance cell proliferation and differentiation, DNA synthesis, secretion of other biologically active molecules and responses to immune and inflammatory stimuli.

RT cells (biology)  
differentiation (biology)  
immune systems  
immunology  
leukocytes

### interlocking

USE **locking**

### intermedia

USE **multimedia**

### intermediate frequencies

DEF The beat frequencies used in heterodyne receivers, usually the difference between the received radiofrequency signal and a locally generated signal.

GS frequencies  
. radio frequencies  
. . **intermediate frequencies**  
RT high frequencies  
low frequencies

### intermediate frequency amplifiers

GS amplifiers  
. **intermediate frequency amplifiers**  
RT beat frequencies  
crystal filters  
heterodyning  
logarithmic receivers  
preamplifiers  
radio receivers  
transistor amplifiers

### intermediate range ballistic missiles

UF *IRBM (missiles)*  
GS missiles  
. ballistic missiles  
. . **intermediate range ballistic missiles**  
. . . Blue Streak missile  
. . . Jupiter missile  
. . . polaris missiles  
. . . . Polaris A1 missile  
. . . . Polaris A2 missile  
. . . . Polaris A3 missile  
. surface to surface missiles  
. . **intermediate range ballistic missiles**  
. . . Blue Streak missile  
. . . Jupiter missile  
. . . polaris missiles  
. . . . Polaris A1 missile  
. . . . Polaris A2 missile  
. . . . Polaris A3 missile  
RT field army ballistic missiles  
fleet ballistic missiles  
intercontinental ballistic missiles  
Mark 1 reentry body  
Mark 2 reentry body  
Mark 3 reentry body  
short range ballistic missiles

### intermetallics

SN (COMPOUNDS CONSISTING OF ONLY METALLIC ELEMENTS)  
UF *electron compounds*  
GS **intermetallics**  
. heavy fermion systems  
. . heavy fermion superconductors  
RT alloying  
alloys  
aluminides  
amines  
antiphase boundaries  
arsenides  
borides  
cluster variation method  
indium gallium arsenides  
inorganic compounds

iron aluminides  
metalloids  
metals  
mischmetal  
nickel aluminides  
phase diagrams  
photoelectromagnetic effects  
semiconductors (materials)  
silicides  
tellurides  
titanium aluminides

### intermittency

RT cycles  
pulses  
random processes

### intermittency hypothesis

GS hypotheses  
. **intermittency hypothesis**  
RT photographic recording

### intermodulation

DEF The modulation of the components of a complex wave by each other in a nonlinear system.

GS modulation  
. **intermodulation**  
RT demodulation  
discriminators  
frequency analyzers  
frequency modulation  
remodulation  
sound-sound interactions  
wave interaction

### intermolecular forces

GS level (quantity)  
. energy levels  
. . molecular energy levels  
. . . **intermolecular forces**  
molecular properties  
. molecular energy levels  
. . **intermolecular forces**  
RT configuration interaction  
excimers  
Lennard-Jones potential  
molecular interactions  
molecular structure  
Van der Waals forces  
virial coefficients

### intermontane floors

USE **valleys**

### internal combustion engines

SN (EXCLUDES ROCKET ENGINES)  
GS engines  
. **internal combustion engines**  
. . diesel engines  
. . gas turbine engines  
. . . hydrogen engines  
. . . jet engines  
. . . T-58 engine  
. . . . ramjet engines  
. . . . . integral rocket ramjets  
. . . . . low volume ramjet engines  
. . . . . pulsejet engines  
. . . . . supersonic combustion ramjet engines  
. . . . . turbo ramjet engines  
. . . . . turbojet engines  
. . . . . Bristol-Siddeley Olympus 593 engine  
. . . . . Bristol-Siddeley Viper engine  
. . . . . ducted fan engines  
. . . . . J-33 engine  
. . . . . J-34 engine  
. . . . . J-47 engine  
. . . . . J-52 engine  
. . . . . J-57 engine  
. . . . . J-58 engine  
. . . . . J-65 engine  
. . . . . J-69-T-25 engine  
. . . . . J-71 engine  
. . . . . J-73 engine  
. . . . . J-75 engine  
. . . . . J-79 engine  
. . . . . J-85 engine  
. . . . . J-93 engine

- ..... RA-28 engine
- ..... turbofan engines
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- .. helicopter engines
- .. rotary engines
- .. Wankel engines

RT afterburning  
aircraft engines  
automobile engines  
automobile fuels

∞ bearing  
bearings  
booster rocket engines  
cams  
carburetors  
combustion  
combustion chambers  
diesel fuels  
distributors  
ducted rocket engines  
electric hybrid vehicles  
engine parts  
engine primers  
engine starters  
exhaust systems  
external combustion engines  
fuel consumption  
fuel injection  
fuel pumps  
fuel systems  
gas turbines  
hybrid propellant rocket engines  
ignition systems  
liquid propellant rocket engines  
lubrication systems  
piston engines  
pistons  
retrorocket engines  
rocket engines  
solid propellant rocket engines  
spark plugs  
superchargers  
sustainer rocket engines  
thermodynamic cycles  
thermodynamic efficiency  
torpedo engines  
Vernier engines

**internal compression inlets**

GS intake systems  
. **internal compression inlets**

RT air intakes  
compressing  
engine inlets  
inlet nozzles  
supersonic inlets

**internal conversion**

RT ∞ conversion  
nuclear reactions

**internal energy**

DEF A mathematically defined thermodynamic function of state, interpretable through statistical mechanics as a measure of the molecular activity of the system.

RT chemical energy

∞ energy  
free energy  
Gibbs-Helmholtz equations  
kinetic energy  
∞ level

molecular energy levels  
particle energy  
potential energy  
thermal energy  
thermodynamics

**internal flow**

(added January 1995)  
GS fluid flow  
. **internal flow**  
.. cavity flow  
.. channel flow  
... open channel flow  
.. ducted flow  
... Knudsen flow  
.. inlet flow  
.. nozzle flow  
.. pipe flow

RT Couette flow  
fluidics  
hydrodynamics  
pipes (tubes)

**internal friction**

GS friction  
. **internal friction**

RT anelasticity  
attenuation  
cohesion  
damping  
density (mass/volume)  
eddy viscosity  
hysteresis  
mechanical properties

∞ physical properties  
plastic flow  
viscosity

**internal pressure**

SN (LIMITED TO PRESSURE INSIDE A PORTION OF MATTER DUE TO ATTRACTION BETWEEN MOLECULES)

DEF The pressure inside a portion of matter due to the attraction between molecules.

GS pressure  
. **internal pressure**

RT adhesion  
cohesion  
gas pressure  
partial pressure  
pressure distribution  
spreading  
temperature inversions

*internal stress*

USE **residual stress**

**internal waves**

DEF In fluid mechanics, wave motions of stably stratified fluids in which the maximal vertical motions occur below the surface of the fluids.

GS **internal waves**  
.. planetary waves

RT evanescent waves  
surface waves

∞ waves

*International Cometary Explorer*

USE **International Sun Earth Explorer 3**

*International Computers Limited*

USE **ICL computers**

**international cooperation**

GS policies  
.. foreign policy  
... international relations  
... **international cooperation**  
... outer space treaty

RT A-300 aircraft  
A-310 aircraft  
A-320 aircraft  
A-330 aircraft  
A-340 aircraft  
A-380 aircraft  
Anik 1  
Anik 2  
Anik 3  
Anik satellites  
Apollo Soyuz test project

Arabsat  
Arcosnat  
Azur satellite  
Cassini mission  
Cluster Mission  
Committee on Space Research  
Communications Technology Satellite conventions  
∞ cooperation  
Cosmos 782 satellite  
Cosmos 936 satellite  
Cosmos 1129 satellite  
disarmament  
EISCAT radar system (Europe)  
Energiya launch vehicle  
ESA satellites  
European Airbus  
European Southern Observatory  
European Union  
federations  
French space program  
GLONASS  
Granat satellite  
information transfer  
INMARSAT satellites  
integrated global ocean station systems  
International Hydrological Decade  
International Satellite Geodesy Experiment  
International Space Station  
North Atlantic Treaty Organization (NATO)  
Orbiting Frog Otolith  
Palapa 2 satellite  
Palapa satellites  
peacetime  
politics  
Proton launch vehicle  
ROSAT mission  
Russian Space Program  
sea law  
SOHO Mission  
sovereignty  
Symphonie satellites  
U.S.S.R. space program  
United Nations  
user requirements  
Vega project  
World Meteorological Organization

**International Field Year for Great Lakes**

RT Canada  
Great Lakes (North America)  
United States

**International Geophysical Year**

DEF By international agreement, a period during which greatly increased observation of worldwide geophysical phenomena is undertaken through the cooperative effort of participating nations. July 1957 to December 1958 was the first such year; however, precedent was set by the International Polar Years of 1882 and 1932. Used for IGY (geophysical year).

UF *IGY (geophysical year)*

RT geophysics  
Vanguard satellites  
world data centers

**International Geosphere-Biosphere program**

GS programs  
. **International Geosphere-Biosphere program**

RT biogeochemistry  
biosphere  
Earth observations (from space)  
geophysics  
man environment interactions  
solar terrestrial interactions

**International Hydrological Decade**

DEF A ten-year program, 1965-74, patterned after the International Geophysical Year, aimed at training hydrologists and technicians, and at the establishment of networks for measuring hydrologic data. The idea originated in the United States, but the program was spon-

## international law

sored by UNESCO, and a large proportion of membership of the United Nations participated. Used for IHD (hydrological decade).

- UF *IHD (hydrological decade)*
- RT Canada
  - foreign policy
  - hydrology
  - international cooperation
  - international relations
  - precipitation (meteorology)
  - river basins
  - streams
  - United States
  - water resources
  - watersheds

### international law

- GS law (jurisprudence)
  - . **international law**
  - .. air law
  - .. sea law
  - .. space law
- RT conventions
  - European Union
  - legal liability
  - nations
  - outer space treaty
  - peacetime
  - politics
  - sovereignty
  - United Nations
  - warfare

### International Magnetospheric Explorer

- UF *IME satellite*
- GS artificial satellites
  - . scientific satellites
  - .. Explorer satellites
  - ... **International Magnetospheric Explorer**
- RT Delta launch vehicle
- Earth magnetosphere

### International Magnetospheric Study

DEF Joint US, ESA, Japanese, and Canadian effort (1976-1979) for observation and measurement of magnetospheric and ionospheric phenomena and involving spacecraft, aircraft, balloons, and rockets, as well as ground based equipment. Used for IMS.

- UF *IMS*
- GS investigation
  - . **International Magnetospheric Study**
- RT atmospheric physics
- Earth magnetosphere
- European space programs
- geomagnetism
- interplanetary magnetic fields

### international practical temperature

USE **temperature scales**

### International Quiet Sun Year

DEF An international cooperative program during 1964-65 of studying solar-terrestrial phenomena during a quiet sun, i.e., sunspot minimum, period. It is related to the International Geophysical Year and to the International Active Sun Years. Used for IQSY (international year)

- UF *IQSY (international year)*
- RT solar activity
- solar cycles
- solar physics

### international relations

- GS policies
  - . foreign policy
  - .. **international relations**
  - ... international cooperation
  - ... outer space treaty
- RT Apollo Soyuz test project
- International Hydrological Decade
- International Space Year

U.S.S.R. space program

### International Satellite Cloud Climatology

USE **ISCCP Project**

### International Satellite Geodesy Experiment

- UF *ISAGEX*
- RT celestial geodesy
- European space programs
- geodetic coordinates
- international cooperation
- satellite tracking
- U.S.S.R. space program

### International Sats for Ionospheric Study

USE **ISIS satellites**

### International Solar Polar Mission

USE **Ulysses mission**

### International Space Station

(added December 1994)

UF *ISS (space station)*

- GS artificial satellites
  - . space stations
  - .. **International Space Station** stations
  - . space stations
  - .. **International Space Station**
- RT Alpha Magnetic Spectrometer
- Assured Crew Return Vehicle
- Columbus module
- Columbus space station
- Crew Equipment Translation Aid (ISS)
- Cupola Module
- Destiny Laboratory Module
- Integrated Truss Structure P1
- Integrated Truss Structure S1
- Integrated Truss Structure Z1
- international cooperation
- Kibo Japanese Experiment Module
- large space structures
- manned orbital laboratories
- Mir space station
- Multi-Purpose Logistics Modules
- Service Module (ISS)
- space shuttles
- Space Station Freedom
- Space Station Mobile Servicing System
- space station modules
- spaceborne experiments
- Unity connecting module
- Zarya control module

### International Space Year

(added April 1993)

UF *ISY*

- RT ∞ aerospace sciences
- international relations
- NASA space programs
- space exploration
- space programs

### International Sun Earth Explorer 1

DEF First joint NASA-ESA satellite launched to investigate sun-Earth relationships and solar phenomena.

- GS artificial satellites
  - . scientific satellites
  - .. Explorer satellites
  - ... International Sun Earth Explorers
  - ... **International Sun Earth Explorer 1**

### International Sun Earth Explorer 2

DEF Second joint NASA-ESA satellite launched to investigate sun-Earth relationships and solar phenomena.

- GS artificial satellites
  - . scientific satellites
  - .. Explorer satellites
  - ... International Sun Earth Explorers
  - ... **International Sun Earth Explorer 2**

### International Sun Earth Explorer 3

DEF The last in a series of three spacecraft developed by NASA and ESA for the study of the magnetosphere. ISEE C was launched into a

heliocentric orbit and will make observations in the solar wind up stream of the Earth. Used for International Cometary Explorer.

- UF *International Cometary Explorer*
- GS artificial satellites
  - . scientific satellites
  - .. Explorer satellites
  - ... International Sun Earth Explorers
  - ... **International Sun Earth Explorer 3**

### International Sun Earth Explorers

- UF *ISEE*
- GS artificial satellites
  - . scientific satellites
  - .. Explorer satellites
  - ... **International Sun Earth Explorers**
  - ... International Sun Earth Explorer 1
  - ... International Sun Earth Explorer 2
  - ... International Sun Earth Explorer 3

### International System of Units

DEF The metric system of units based on the meter, kilogram, second, ampere, kelvin degree, and candela. Other SI units are hertz, radian, newton, joule, watt, coulomb, volt, ohm, farad, weber and tesla. Used for metric system and SI.

- UF *metric system*
- SI
- GS units of measurement
  - . **International System of Units**
- RT conversion tables
- ∞ measurement
- measuring instruments
- metrication
- metrology
- ∞ systems

### international trade

- UF *exports*
- foreign trade*
- RT economics
- revenue

### International Ultraviolet Explorer

USE **IUE**

### Internet resources

(added January 1997)

- SN (USE FOR SOURCES OF INFORMATION, DATA, OR COMPUTER SOFTWARE ACCESSIBLE VIA THE INTERNET; FOR DESIGN OR FUNCTIONAL ASPECTS OF COMPUTER INTERNETWORKS USE "INTERNETS")
- DEF Sources of information, data, or computer software accessible via the Internet.
- GS resources
  - . **Internet resources**
  - .. websites
- RT electronic bulletin boards
- electronic commerce
- electronic mail
- information dissemination
- information resources management
- information systems
- internets
- news media
- services

### internets

(added January 1994)

- SN (REFERS TO ANY INTERLINKED SYSTEM OF SEPARATE COMPUTER NETWORKS)
- GS networks
  - . communication networks
  - .. **internets**
  - ... ARPA computer network
  - ... World Wide Web
  - .. computer networks
  - .. **internets**
  - ... ARPA computer network
  - ... World Wide Web
- RT client server systems
- computer security
- electronic bulletin boards
- electronic mail

Internet resources  
Java (programming language)  
web services  
websites

**internuclear properties**

RT molecular interactions  
∞ molecular physics

**interoperability**

(added July 2001)

DEF The ability of different systems, devices, or software to exchange information or otherwise operate effectively together.

RT commonality  
data transfer (computers)  
information transfer  
protocol (computers)  
standards  
systems compatibility  
systems integration

**interorbital trajectories**

GS trajectories  
. **interorbital trajectories**  
RT interplanetary trajectories  
round trip trajectories  
spacecraft trajectories

*interpersonal relations*

USE **human relations**

**interphones**

GS communication equipment  
. **interphones**  
RT earphones  
microphones  
telecommunication

**interplanetary communication**

GS telecommunication  
. space communication  
. . **interplanetary communication**  
RT circumlunar communication  
extraterrestrial communication  
facsimile communication  
lasers  
lunar communication  
Mars Reconnaissance Orbiter  
optical communication  
radio communication  
satellite communication  
spacecraft communication

**interplanetary dust**

GS extraterrestrial matter  
. interstellar matter  
. . cosmic dust  
. . . **interplanetary dust**  
. . . . meteoroid dust clouds  
. . . . . zodiacal dust  
media  
. interplanetary medium  
. . **interplanetary dust**  
. . . meteoroid dust clouds  
. . . . zodiacal dust  
particles  
. dust  
. . cosmic dust  
. . . **interplanetary dust**  
. . . . meteoroid dust clouds  
. . . . . zodiacal dust  
RT meteoroids  
micrometeoroids

*Interplanetary Explorer*

USE **Explorer 18 satellite**

**interplanetary flight**

UF *planetary space flight*  
space flight  
GS . **interplanetary flight**  
RT asteroid missions  
astrodynamics  
Earth-Venus trajectories  
flyby missions  
interstellar spacecraft  
long duration space flight  
magnetic sails  
manned Mars missions

manned space flight  
Mariner Jupiter-Saturn flyby  
Mariner Jupiter-Uranus flyby  
Mariner Mark 2 Spacecraft  
Mars exploration  
matter-antimatter propulsion  
negative matter propulsion  
orbits  
outer planets explorers  
planetary landing  
return to Earth space flight  
round trip trajectories  
space exploration  
space navigation  
spacecraft guidance  
TOPS (spacecraft)

**interplanetary gas**

GS extraterrestrial matter  
. cosmic gases  
. . **interplanetary gas**  
gases  
. rarefied gases  
. . cosmic gases  
. . . **interplanetary gas**  
media  
. interplanetary medium  
. . **interplanetary gas**  
RT cosmic plasma  
interstellar gas  
neutral gases  
solar wind

**interplanetary magnetic fields**

GS magnetic fields  
. **interplanetary magnetic fields**  
RT Chapman-Ferraro problem  
flux transfer events  
International Magnetospheric Study  
magnetic clouds  
magnetic field reconnection  
solar magnetic field  
Wind/GGS spacecraft

**interplanetary medium**

GS media  
. **interplanetary medium**  
. . interplanetary dust  
. . . meteoroid dust clouds  
. . . . zodiacal dust  
. . . . . interplanetary gas  
RT Advanced Composition Explorer  
interplanetary shock waves  
magnetic clouds  
mass distribution  
meteoroids  
plasma clouds  
solar wind

*Interplanetary Monitoring Platform*

USE **IMP**

**interplanetary navigation**

GS navigation  
. space navigation  
. . **interplanetary navigation**  
RT astronavigation  
celestial navigation  
celestial reference systems  
radar navigation  
radio navigation

*interplanetary propulsion*

USE **interplanetary spacecraft rocket engines**

**interplanetary shock waves**

(added April 2007)

DEF Shock waves in the solar corona and interplanetary space caused by the interaction of fast coronal mass ejections, the solar wind, and the interplanetary magnetic field. Interplanetary shock waves occur when the speed of the coronal mass ejection is faster than the local fast magnetosonic speed.

UF *interplanetary shocks*  
GS elastic waves  
. shock waves  
. . **interplanetary shock waves**  
RT coronal mass ejection

interplanetary medium  
shock wave interaction  
shock wave propagation  
solar activity  
solar activity effects  
solar corona  
solar flares  
solar radio bursts  
solar wind  
space weather

*interplanetary shocks*

(added April 2007)

USE **interplanetary shock waves**

**interplanetary space**

UF *translunar space*  
GS environments  
. aerospace environments  
. . deep space  
. . . **interplanetary space**  
. . . extraterrestrial environments  
. . . . deep space  
. . . . . **interplanetary space**  
RT cislunar space  
heliosphere  
interstellar space  
polar cusps

**interplanetary spacecraft**

UF *interplanetary propulsion planetary spacecraft*  
GS **interplanetary spacecraft**  
. Explorer 18 satellite  
. Jupiter probes  
. . Galileo probe  
. . Galileo spacecraft  
. . Mariner space probes  
. . . Mariner 1 space probe  
. . . Mariner 2 space probe  
. . . Mariner 3 space probe  
. . . Mariner 4 space probe  
. . . Mariner 5 space probe  
. . . Mariner 6 space probe  
. . . Mariner 7 space probe  
. . . Mariner 8 space probe  
. . . Mariner 9 space probe  
. . . Mariner 10 space probe  
. . . Mariner 11 space probe  
. . . Mariner R 2 space probe  
. . Mariner spacecraft  
. . . Mariner C spacecraft  
. . . Mariner Venus 67 spacecraft  
. . Mars probes  
. . . Advanced Recon Electric Spacecraft  
. . . Mariner 3 space probe  
. . . Mariner 4 space probe  
. . . Mariner 6 space probe  
. . . Mariner 7 space probe  
. . . Mariner 8 space probe  
. . . Mariner 9 space probe  
. . Mars 1 spacecraft  
. . Mars 2 spacecraft  
. . Mars 3 spacecraft  
. . Mars 4 Spacecraft  
. . Mars 5 spacecraft  
. . Mars 6 spacecraft  
. . Mars 7 spacecraft  
. . Mars Observer  
. . Mars Pathfinder  
. . Viking 1975 entry vehicle  
. . Viking spacecraft  
. . . Viking 1 spacecraft  
. . . . Viking lander 1  
. . . . . Viking orbiter 1  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 2  
. . . . . Viking orbiter 1975  
. . Mars Climate Orbiter  
. . Mars Express  
. . Mars Global Surveyor  
. . Mars Polar Lander

## interplanetary trajectories

- . . Mars Reconnaissance Orbiter
- . . Nozomi Mars Orbiter
- . . Phobos spacecraft
- . . Phoenix Mars Lander
- . . Zond 2 space probe
- . Pioneer space probes
  - . . Pioneer 1 space probe
  - . . Pioneer 2 space probe
  - . . Pioneer 3 space probe
  - . . Pioneer 4 space probe
  - . . Pioneer 5 space probe
  - . . Pioneer 6 space probe
  - . . Pioneer 7 space probe
  - . . Pioneer 8 space probe
  - . . Pioneer 9 space probe
  - . . Pioneer 10 space probe
  - . . Pioneer 11 space probe
  - . . Pioneer Venus 2 entry probes
    - . . . Pioneer Venus 2 night probe
    - . . . Pioneer Venus 2 sounder probe
  - . . Pioneer Venus spacecraft
    - . . Pioneer Venus 1 spacecraft
    - . . Pioneer Venus 2 spacecraft
      - . . . Pioneer Venus 2 entry probes
      - . . . Pioneer Venus 2 night probe
      - . . . Pioneer Venus 2 sounder probe
      - . . . Pioneer Venus 2 transporter bus
  - . TOPS (spacecraft)
  - . Venus probes
    - . . Magellan spacecraft (NASA)
    - . . Mariner 1 space probe
    - . . Mariner 2 space probe
    - . . Mariner 5 space probe
    - . . Mariner 10 space probe
    - . . Pioneer Venus 2 spacecraft
      - . . . Pioneer Venus 2 entry probes
      - . . . Pioneer Venus 2 night probe
      - . . . Pioneer Venus 2 sounder probe
      - . . . Pioneer Venus 2 transporter bus
    - . Venera satellites
      - . . Venera 2 satellite
      - . . Venera 3 satellite
      - . . Venera 4 satellite
      - . . Venera 5 satellite
      - . . Venera 6 satellite
      - . . Venera 7 satellite
      - . . Venera 8 satellite
      - . . Venera 9 satellite
      - . . Venera 10 satellite
      - . . Venera 11 satellite
      - . . Venera 12 satellite
    - . Zond 1 space probe
    - . Zond 3 space probe
    - . Zond 4 space probe
    - . Zond 5 space probe
    - . Zond 6 space probe
    - . Zond 7 space probe
    - . Zond 8 space probe
- RT artificial satellites
  - . Deep Space 1 Mission
  - . interstellar spacecraft
  - . landing modules
  - . maneuverable spacecraft
  - . manned Mars missions
  - . manned spacecraft
  - . matter-antimatter propulsion
  - . rendezvous spacecraft
  - . reusable spacecraft
  - . space capsules
  - . space exploration
  - . space probes
    - ∞ spacecraft
    - ∞ unmanned spacecraft
    - . Voyager 1977 mission

- . spacecraft trajectories
  - . . **interplanetary trajectories**
    - . . . Earth-Mars trajectories
    - . . . Earth-Mercury trajectories
    - . . . Earth-Venus trajectories
  - RT Earth-Moon trajectories
    - . Goddard Trajectory Determination System
    - . interorbital trajectories
    - . orbital launching
    - . orbital mechanics
    - . parking orbits
    - . planetary orbits
    - . rendezvous trajectories
    - . round trip trajectories
    - . solar orbits
    - . space navigation
    - . spacecraft guidance
    - . transfer orbits
      - . Viking 1 spacecraft
      - . Viking 2 spacecraft
      - . Viking lander 1
      - . Viking lander 2
      - . Viking lander spacecraft
      - . Viking orbiter 1
      - . Viking orbiter 2
      - . Viking orbiter spacecraft

### interplanetary transfer orbits

- GS orbits
  - . elliptical orbits
  - . . transfer orbits
    - . . . **interplanetary transfer orbits**
      - . spacecraft orbits
      - . . transfer orbits
        - . . . **interplanetary transfer orbits**
          - RT aeroassist
          - aerobraking
          - aerocapture
          - aeromaneuvering
          - low Earth orbits
          - orbital mechanics
          - swingby technique

### interpolation

- GS analysis (mathematics)
  - . numerical analysis
    - . . **interpolation**
      - RT commutation
      - computation
      - extrapolation
      - finite difference theory
      - statistical analysis

### interpolators

USE **repeaters**

### ∞ interpretation

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT decoding
- intelligibility
- perception
- photointerpretation
- reading
- recognition
- syntax
- translating

### interprocessor communication

- DEF Communication between two or more processors in a computer system.
- RT computer networks
  - . computer systems design
  - . Connection Machine
  - . Dining Philosophers Problem
  - . distributed memory
  - . free-space optical interconnects
  - . hypercube multiprocessors
  - . local area networks
  - . MIMD (computers)
  - . multiprocessing (computers)
  - . parallel processing (computers)
  - . SIMD (computers)
  - . transmission rate (communications)
  - . transputers

VSAT (network)

### interrelationships

USE **relationships**

### interrogation

- RT data processing
- IFF systems (identification)
- secondary radar
- transmitter receivers
- transponders

### interruption

- RT electric relays
- packet switching
- sequencing
- switches
- switching

### intersections

- SN (EXCLUDES BOOLEAN LOGICAL PRODUCTS)
- DEF In Boolean algebra, the operation in which concepts are described by stating that they have all the characteristics of the classes involved. Intersection is expressed as AND.
- RT crossings
  - . crossovers
  - . highways
  - ∞ junctions
  - . ramps (structures)
  - . roads
  - . streets
  - . transportation networks

### interservice data exchange program

- UF *IDEF (data exchange)*
- RT ∞ data
  - . data retrieval
  - . data storage
  - . information retrieval
  - . libraries
  - . military technology
  - . research

### interstellar chemistry

- DEF Molecular formation/dissociation in interstellar space due to radiation, collision, and other forces.
- RT association reactions
  - . chemical reactions
  - ∞ chemistry
    - . cosmochemistry
    - . diffuse interstellar bands
    - . formyl ions
    - . interstellar matter
    - . isotope ratios
    - . laboratory astrophysics
    - . molecular clouds
    - . molecular interactions
    - . reaction kinetics
    - . Submillimeter Wave Astronomy Satellite

### interstellar communication

- GS communicating
  - . **interstellar communication**
    - RT extraterrestrial intelligence
    - radio communication
    - space communication

### interstellar extinction

- UF *interstellar reddening*
- GS extinction
  - . **interstellar extinction**
    - RT astrophysics
    - diffuse interstellar bands
    - evolution (development)
    - interstellar gas
    - radiation absorption
    - stellar evolution
    - stellar radiation

### interstellar gas

- GS extraterrestrial matter
  - . cosmic gases
    - . . **interstellar gas**
      - . interstellar matter
        - . . **interstellar gas**
          - . gases
          - . rarefied gases

## interplanetary trajectories

GS trajectories

- . . cosmic gases
- . . . **interstellar gas**
- RT cooling flows (astrophysics)
- galactic halos
- H I regions
- H II regions
- heliosphere
- interplanetary gas
- interstellar extinction
- magnetic clouds
- methylidyne
- molecular clouds
- neutral gases
- Ophiuchi clouds
- Orion nebula
- spin temperature
- star formation
- stellar mass accretion
- stellar winds
- interstellar magnetic fields**
- UF *galactic magnetic fields*
- GS magnetic fields
- . **interstellar magnetic fields**
- RT magnetic clouds
- stellar magnetic fields
- interstellar masers**
- GS stimulated emission devices
- . masers
- . . **interstellar masers**
- RT coherent electromagnetic radiation
- gas masers
- lasers
- microwave amplifiers
- molecular clouds
- radiation sources
- stimulated emission
- water masers
- interstellar matter**
- GS extraterrestrial matter
- . **interstellar matter**
- . . cosmic dust
- . . . interplanetary dust
- . . . . meteoroid dust clouds
- . . . . zodiacal dust
- . . dark matter
- . . interstellar gas
- RT Alpha Magnetic Spectrometer
- celestial bodies
- diffuse interstellar bands
- formyl ions
- gravitational instability
- H I regions
- H II regions
- infrared cirrus (astronomy)
- interstellar chemistry
- laboratory astrophysics
- mass distribution
- metallicity
- methylidyne
- molecular clouds
- nebulae
- Ophiuchi clouds
- Orion nebula
- polycyclic aromatic hydrocarbons
- Population I stars
- reflection nebulae
- spin temperature
- star formation
- Stardust Mission
- stellar envelopes
- stellar mass accretion
- Submillimeter Wave Astronomy Satellite
- interstellar microwave spectra*
- USE **interstellar radiation microwave spectra**
- interstellar radiation**
- UF *interstellar microwave spectra*
- GS extraterrestrial radiation
- . **interstellar radiation**
- RT corpuscular radiation
- cosmic noise
- cosmic rays
- electromagnetic radiation
- galactic radiation
- gamma ray bursts
- $\infty$  radiation
- radiative transfer
- stellar radiation
- interstellar reddening*
- USE **interstellar extinction**
- interstellar space**
- GS environments
- . aerospace environments
- . . deep space
- . . . **interstellar space**
- . extraterrestrial environments
- . . deep space
- . . . **interstellar space**
- RT interplanetary space
- interstellar spacecraft**
- RT interplanetary flight
- interplanetary spacecraft
- interstellar travel
- space exploration
- interstellar travel**
- GS space flight
- . **interstellar travel**
- RT astronavigation
- celestial reference systems
- extraterrestrial intelligence
- interstellar spacecraft
- long duration space flight
- magnetic sails
- manned space flight
- matter-antimatter propulsion
- negative matter propulsion
- interstices**
- RT cavities
- cracks
- grain boundaries
- percolation
- permeability
- pinholes
- porosity
- porous materials
- voids
- interstitials**
- RT additives
- antisite defects
- crystal defects
- crystal structure
- grain boundaries
- Laves phases
- intersymbolic interference**
- RT cochannel interference
- data transmission
- $\infty$  interference
- signal distortion
- transmission efficiency
- intertropical convergent zones**
- GS regions
- . tropical regions
- . . **intertropical convergent zones**
- RT atmospheric circulation
- fronts (meteorology)
- GARP Atlantic Tropical Experiment
- tropical meteorology
- zonal flow (meteorology)
- intervals**
- RT alternations
- consecutive events
- spacing
- step functions
- time
- topology
- intervehicle spacecrew transfer*
- USE **spacecrew transfer**
- intervertebral disks**
- GS disks (shapes)
- . **intervertebral disks**
- RT  $\infty$  disks
- musculoskeletal system
- vertebrae
- intestines**
- GS anatomy
- . digestive system
- . . gastrointestinal system
- . . . **intestines**
- . . . . rectum
- RT abdomen
- appendix (anatomy)
- colic
- intoxication**
- RT  $\infty$  poisoning
- toxicity and safety hazard
- toxicology
- intracloud discharges**
- (added August 1999)
- GS electric current
- . electric discharges
- . . lightning
- . . . **intracloud discharges**
- intracranial cavity**
- GS anatomy
- . head (anatomy)
- . . skull
- . . . cranium
- . . . . **intracranial cavity**
- . musculoskeletal system
- . . bones
- . . . skull
- . . . . cranium
- . . . . . **intracranial cavity**
- intracranial pressure**
- GS pressure
- . **intracranial pressure**
- RT brain
- intramolecular structures**
- RT molecular structure
- $\infty$  structures
- intraocular pressure**
- UF *tonometry*
- GS pressure
- . **intraocular pressure**
- RT glaucoma
- intraorbit transfer vehicles**
- DEF Small scooter type tugs that would move men and materials within an orbit.
- RT Columbus space station
- large space structures
- space platforms
- space shuttles
- $\infty$  vehicles
- intraseasonal oscillations*
- (added September 2000)
- USE **intraseasonal variations**
- intraseasonal variations**
- (added September 2000)
- UF *intraseasonal oscillations*
- GS variations
- . periodic variations
- . . **intraseasonal variations**
- . . . Madden-Julian Oscillation
- RT annual variations
- atmospheric circulation
- atmospheric models
- climatology
- tropical meteorology
- intravascular system**
- RT blood circulation
- $\infty$  systems
- intravehicular activity**
- RT  $\infty$  activity
- astronaut locomotion
- astronaut maneuvering equipment
- astronaut performance
- extravehicular activity
- human performance
- manned space flight
- pilot performance
- spacecraft environments

## intravenous procedures

weightlessness

### intravenous procedures

- RT bioavailability
- catheterization
- in vivo methods and tests
- medical services

### introversion

- RT ∞ depression
- detachment
- human behavior
- ∞ inhibition
- psychology

### Intruder aircraft

USE **A-6 aircraft**

### intrusion

- RT contamination
- extruding
- leakage
- seepage

### intrusion detection (computers)

(added January 2003)

DEF Manual or software-based detection of unauthorized entries or attempted break-ins into a computer system or network. The detection analysis is typically conducted using logs or other internal system information.

- GS security
  - . computer security
  - . . **intrusion detection (computers)**
- RT access control
- computer networks
- computer viruses
- firewalls (computers)

### Invader aircraft

USE **B-26 aircraft**

### invalidity

USE **errors**

### invariance

- GS **invariance**
  - . gauge invariance
- RT ∞ constant
- Lorentz transformations

### invariant imbeddings

- GS geometry
  - . topology
  - . . imbeddings (mathematics)
  - . . . **invariant imbeddings**
- RT anisotropic fluids
- calculus of variations
- conformal mapping
- coordinate transformations
- differential geometry
- ∞ imbeddings
- isotropic turbulence

### inventions

- RT intellectual property
- patent applications
- patent policy
- patents
- product development

### inventories

- GS **inventories**
  - . crop inventories
  - . timber inventory
- RT Large Area Crop Inventory
- Experiment
- reserves
- ∞ storage

### inventory controls

- GS management
  - . industrial management
  - . . inventory management
  - . . . **inventory controls**
  - . logistics management
  - . . inventory management
  - . . . **inventory controls**
- RT ∞ control
- distributing
- mathematical models

optimal control

reserves

risk

∞ storage

time lag

### inventory management

- GS management
  - . industrial management
  - . . **inventory management**
  - . . . inventory controls
  - . logistics management
  - . . **inventory management**
  - . . . inventory controls
- RT downtime
- logistics
- procurement management
- resources
- retirement for cause
- services
- spare parts
- stockpiling
- ∞ storage

### inverse kinematics

(added December 1990)

- GS kinematics
  - . **inverse kinematics**
- RT dynamic control
- feedback control
- manipulators
- robot control
- robot dynamics
- robotics

### inverse scattering

DEF Method for analyzing some classic

wave scattering.

- GS scattering
  - . **inverse scattering**
- RT forward scattering
- resonance scattering

### inversions

- GS **inversions**
  - . magnetic field inversions
  - . population inversion
  - . temperature inversions

### invertebrates

- GS animals
  - . **invertebrates**
  - . . arthropods
    - . . . artemia
    - . . . crabs
    - . . . insects
      - . . . . bees
      - . . . . bollworms
      - . . . . chironomus flies
      - . . . . cockroaches
      - . . . . Coleoptera
        - . . . . . beetles
        - . . . . . tribolia
        - . . . . . boll weevils
        - . . . . . crickets
        - . . . . . Drosophila
        - . . . . . fireflies
        - . . . . . grasshoppers
        - . . . . . locusts
        - . . . . . moths
        - . . . . . silkworms
      - . . . . . spiders
      - . . . . . mollusks
      - . . . . . cephalopods
        - . . . . . octopuses
        - . . . . . snails
        - . . . . . Rotifera
        - . . . . . sea urchins
        - . . . . . worms
        - . . . . . flatworms
  - . . . bacteria
  - . . . hemocytes
  - . . . larvae
  - . . . microorganisms
  - . . . poikilothermia

### inverted converters (DC to AC)

- RT alternating current
- ∞ converters
- current converters (AC to DC)

direct current

electric current

### inverters

- SN (EXCLUDES AC TO DC INVERTERS)
- GS **inverters**
  - . static inverters
- RT attenuators
- oscillators

### investigation

- UF *studies*
- GS **investigation**
  - . accident investigation
  - . . aircraft accident investigation
  - . International Magnetospheric Study
- RT examination
- experimentation
- exploration
- geophysical fluid flow cells
- OSS-1 payload
- programs
- research
- research and development
- sampling
- university program

### ∞ investment

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT commerce
- investment casting
- investments

### investment casting

- UF *lost wax process*
- GS forming techniques
  - . casting
  - . . **investment casting**
- RT centrifugal casting
- ∞ investment

### investments

- RT depreciation
- economic impact
- economics
- finance
- ∞ investment

### inviscid flow

- UF *nonviscous flow*
- GS fluid flow
  - . **inviscid flow**
  - . . stagnation flow
- RT aerodynamics
- Crocco method
- Crocco-Lee theory
- ∞ flow
- flow characteristics
- gas flow
- laminar flow
- potential flow
- Prandtl number
- Reynolds number
- stagnation temperature
- turbulent flow
- viscous flow

### invisibility

USE **visibility**

### involutariness

USE **involuntary actions**

### involuntary actions

- UF *involutariness*
- RT autonomic nervous system
- sneezing
- spasms
- twitching

### involuntary muscle

(added December 2004)

USE **smooth muscle**

### Io

- DEF A satellite of Jupiter orbiting at a mean distance of 421,800 kilometers. Also called Jupiter I.
- GS celestial bodies

- . natural satellites
- . . . Jupiter satellites
- . . . . Galilean satellites
- . . . . . **Io**
- RT Callisto
- Charon
- Ganymede
- Jupiter (planet)
- iodates**
- GS halogen compounds
- . iodine compounds
- . . **iodates**
- . . . lithium iodates
- iodides**
- GS halogen compounds
- . iodine compounds
- . . **iodides**
- . . . cesium iodides
- . . . gallamine triethiodide
- . . . hafnium iodides
- . . . niobium iodides
- . . . potassium iodides
- . . . silver iodides
- . . . sodium iodides
- . . . zirconium iodides
- iodimetry**
- GS chemical tests
- . chemical analysis
- . . **iodimetry**
- RT quantitative analysis
- ∞ reduction
- titration
- iodine**
- GS chemical elements
- . halogens
- . . **iodine**
- . . . iodine isotopes
- . . . . iodine 125
- . . . . iodine 131
- . . . . iodine 132
- iodine 125**
- GS chemical elements
- . halogens
- . . iodine
- . . . iodine isotopes
- . . . . **iodine 125**
- . . . . nuclides
- . . . . isotopes
- . . . . iodine isotopes
- . . . . . **iodine 125**
- . . . . radioactive isotopes
- . . . . . **iodine 125**
- iodine 131**
- GS chemical elements
- . halogens
- . . iodine
- . . . iodine isotopes
- . . . . **iodine 131**
- . . . . nuclides
- . . . . isotopes
- . . . . iodine isotopes
- . . . . . **iodine 131**
- . . . . radioactive isotopes
- . . . . . **iodine 131**
- iodine 132**
- GS chemical elements
- . halogens
- . . iodine
- . . . iodine isotopes
- . . . . **iodine 132**
- . . . . nuclides
- . . . . isotopes
- . . . . iodine isotopes
- . . . . . **iodine 132**
- . . . . radioactive isotopes
- . . . . . **iodine 132**
- iodine compounds**
- GS halogen compounds
- . **iodine compounds**
- . . iodates
- . . . lithium iodates
- . . iodides
- . . . cesium iodides
- . . . gallamine triethiodide
- . . . hafnium iodides
- . . . niobium iodides
- . . . potassium iodides
- . . . silver iodides
- . . . sodium iodides
- . . . zirconium iodides
- iodine isotopes**
- GS chemical elements
- . halogens
- . . iodine
- . . . **iodine isotopes**
- . . . . iodine 125
- . . . . iodine 131
- . . . . iodine 132
- . . . . nuclides
- . . . . isotopes
- . . . . **iodine isotopes**
- . . . . . iodine 125
- . . . . . iodine 131
- . . . . . iodine 132
- iodine lasers**
- GS stimulated emission devices
- . lasers
- . . **iodine lasers**
- . . . chemical oxygen-iodine lasers
- iodoacetic acid**
- GS acids
- . carboxylic acids
- . . fatty acids
- . . . acetic acid
- . . . . **iodoacetic acid**
- halogen compounds
- . iodine compounds
- . . **iodoacetic acid**
- organic compounds
- . carboxylic acids
- . . fatty acids
- . . . acetic acid
- . . . . **iodoacetic acid**
- ion accelerators**
- GS particle accelerators
- . **ion accelerators**
- RT ∞ accelerators
- synchrotrons
- ion acoustic waves**
- GS elastic waves
- . sound waves
- . . **ion acoustic waves**
- RT plasma oscillations
- plasma waves
- wave propagation
- ion atom interactions**
- GS particle interactions
- . **ion atom interactions**
- RT atomic interactions
- charge exchange
- elementary particle interactions
- ∞ interactions
- ion beams**
- DEF Directed fluxes of charged atoms or molecules.
- GS beams (radiation)
- . particle beams
- . . **ion beams**
- ion currents
- . **ion beams**
- RT atomic beams
- beam injection
- beam neutralization
- inertial fusion (reactor)
- ion optics
- molecular beams
- ion chambers*
- USE **ionization chambers**
- ion channels (biology)**
- (added August 2002)
- DEF Glycoprotein components of biomembranes that control the passage of hydrophilic solutes such as inorganic ions.
- UF *potassium channels (biology)*
- sodium channels (biology)*
- RT bioelectric potential
- bioelectricity
- cell membranes (biology)
- electrophysiology
- neurophysiology
- ion charge**
- GS electric charge
- . **ion charge**
- RT charge exchange
- charged particles
- ionization
- valence
- ion concentration**
- RT acidity
- ∞ bases
- Earth ionosphere
- pH factor
- titration
- ion currents**
- UF *ionic conductivity*
- GS **ion currents**
- . ion beams
- . Pedersen currents
- RT solions
- ion cyclotron radiation**
- GS electromagnetic radiation
- . nonthermal radiation
- . . cyclotron radiation
- . . . **ion cyclotron radiation**
- RT cyclotron resonance
- ionic waves
- magnetic pumping
- plasma radiation
- plasma waves
- ∞ radiation
- ion density (concentration)**
- DEF In atmospheric electricity, the number of ions per unit volume of a given sample of air; more particularly, the number of ions of a given type (positive small ion, negative small ion, positive large ion, or negative large ion) per unit volume of air.
- GS density (number/volume)
- . particle density (concentration)
- . . **ion density (concentration)**
- . . . ionospheric ion density
- . . . magnetospheric ion density
- . . . . magnetospheric proton density
- . . . . proton density (concentration)
- . . . . magnetospheric proton density
- RT atmospheric density
- atom concentration
- cosmic rays
- Earth ionosphere
- electron density (concentration)
- Gerden condensers
- ionization
- ionograms
- plasma density
- positive ions
- Saha equations
- space density
- ion distribution**
- GS distribution (property)
- . **ion distribution**
- RT charge distribution
- current distribution
- electrohydrodynamics
- ionic mobility
- spatial distribution
- vertical distribution
- ion emission**
- GS emission
- . particle emission
- . . **ion emission**
- RT ionization
- thermionic emission



## ion engines

thermionics

### ion engines

DEF Reaction engines in which ions, accelerated in an electrostatic field, are used as propellants. Used for ionic propellants and thermionic reactors. Also called electrostatic engines. Used for ionic propellants and thermionic reactors.

UF *ionic propellants*  
*thermionic reactors*

GS engines  
. rocket engines  
. . electric rocket engines  
. . . electrostatic engines

. . . . **ion engines**  
. . . . . cesium engines  
. . . . . Hall thrusters  
. . . . . mercury ion engines  
. . . . . RIT engines

RT beam switching  
electrothermal engines  
ion optics  
ionizers  
nuclear rocket engines  
plasma engines  
restartable rocket engines  
space station propulsion  
sustainer rocket engines  
∞ thrusters

### ion exchange membrane electrolytes

GS conductors  
. electrolytes  
. . **ion exchange membrane electrolytes**  
membranes  
. **ion exchange membrane electrolytes**

RT fuel cells  
separators

### ion exchange resins

GS resins  
. **ion exchange resins**

RT plastics  
zeolites

### ion exchanging

GS exchanging  
. **ion exchanging**

RT beds (process engineering)  
charge transfer  
demineralizing  
glass electrodes  
hydrometallurgy  
isotope separation  
kaolinite  
metathesis  
∞ separation  
softening  
water treatment

### ion extraction

GS extraction  
. **ion extraction**

RT isotope separation  
∞ separation  
solvent extraction

### ion gages

USE **ionization gages**

### ion impact

GS impact  
. **ion impact**

RT electron impact  
point impact  
recoil ions  
toroids  
Townsend avalanche  
Townsend discharge

### ion implantation

GS implantation  
. **ion implantation**

RT avalanche diodes  
carrier mobility  
diodes  
doping (materials)

field effect transistors  
integrated circuits  
ions  
ITO (semiconductors)  
junction transistors  
metal ions  
metal oxide semiconductors  
microelectronics  
MODFETS  
modulation doping  
MOM (semiconductors)  
photodiodes  
semiconductor devices  
transistors

### ion injection

GS injection  
. **ion injection**

RT carrier injection  
ionic mobility  
plasma accelerators  
plasma generators  
plasma jets

### ion irradiation

GS irradiation  
. **ion irradiation**  
. . deuteron irradiation  
. . proton irradiation

RT auroral irradiation  
electron irradiation  
ionic collisions  
neutron irradiation

### ion microscopes

GS microscopes  
. **ion microscopes**

RT electron microscopes  
electron microscopy  
scanning electron microscopy  
transmission electron microscopy

### ion mobility spectroscopy

(added September 1995)  
UF *plasma chromatography*

GS spectroscopy  
. **ion mobility spectroscopy**

RT airport security  
explosives detection  
mass spectrometers

### ion motion

RT ionic waves  
∞ motion  
Penning discharge  
plasma composition  
plasma diffusion

### ion optics

(added June 1998)  
RT atom optics  
beam waveguides  
beamforming  
electron optics  
ion beams  
ion engines  
ion propulsion  
mass spectrometers  
∞ optics

### ion oscillation

USE **plasma oscillations**

### ion plating

GS plating  
. **ion plating**

RT ions  
metal coatings  
metal ions  
sputtering  
thin films  
vacuum deposition

### ion probes

GS measuring instruments  
. **ion probes**

RT ionosondes

radio frequency impedance probes

### ion production rates

GS ionization  
. **ion production rates**  
rates (per time)  
. **ion production rates**

RT avalanches  
charge exchange  
recoil ions  
thermionic converters

### ion propulsion

GS propulsion  
. electric propulsion  
. . electrostatic propulsion  
. . . **ion propulsion**  
. low thrust propulsion  
. . electrostatic propulsion  
. . . **ion propulsion**  
. spacecraft propulsion  
. . electrostatic propulsion  
. . . **ion propulsion**

RT Deep Space 1 Mission  
duoplasmatrons  
electromagnetic propulsion  
high temperature propellants  
ion optics  
magnetic sails  
nuclear electric propulsion  
plasma propulsion

### ion pumps

GS pumps  
. vacuum pumps  
. . **ion pumps**  
vacuum apparatus  
. vacuum pumps  
. . **ion pumps**

RT getters

### ion recombination

GS chemical reactions  
. **ion recombination**  
recombination reactions  
. **ion recombination**

RT atomic recombination  
deionization  
electron recombination  
electron-ion recombination  
recombination coefficient

### ion scattering

GS scattering  
. **ion scattering**

RT electron scattering  
ionic collisions  
ionic diffusion  
(proton scattering  
recoil ions

### ion selective electrodes

GS electrodes  
. **ion selective electrodes**

RT chemical analysis

### ion sheaths

GS sheaths  
. **ion sheaths**

RT plasma clouds  
plasma probes  
plasma sheaths

### ion sources

GS **ion sources**  
. plasmatrons  
. . duoplasmatrons

RT electron sources  
ionization  
ionizing radiation  
linear accelerators  
particle accelerators  
plasma generators  
radiation sources  
∞ sources

- sputtering
- ion spectrometers*  
USE **mass spectrometers**
- ion storage**  
DEF Ions within an electromagnetic trap and cooled to sub-Kelvin temperatures with lasers. Potential uses are for frequency standards.  
RT frequency standards  
∞ storage trapping
- ion stripping**  
DEF A procedure following the focusing of ion beams in the target chamber of a reactor to be used for particle beam pellet fusion.  
RT heavy ions  
particle beams  
particle density (concentration)  
particles  
∞ separation  
∞ stripping
- ion temperature**  
GS temperature  
. **ion temperature**  
RT auroral temperature  
ionospheric temperature  
plasma temperature  
space temperature  
specific heat
- ion traps (instrumentation)**  
GS measuring instruments  
. **ion traps (instrumentation)** traps  
. **ion traps (instrumentation)**  
RT radiation counters  
vapor traps
- ion-gas interactions*  
USE **gas-ion interactions**
- ionic collisions**  
UF *heavy ion collisions*  
GS collisions  
. **ionic collisions**  
RT atomic collisions  
ion irradiation  
ion scattering  
particle collisions  
recoil ions
- ionic conductivity*  
USE **ion currents**
- ionic crystals**  
GS crystals  
. **ionic crystals**  
RT chemical bonds  
crystal lattices  
excitons  
lattice energy  
polarons
- ionic diffusion**  
GS diffusion  
. particle diffusion  
. **ionic diffusion**  
RT ambipolar diffusion  
diffusion waves  
electron diffusion  
ion scattering  
plasma diffusion  
self diffusion (solid state)
- ionic mobility**  
DEF In gaseous electric conduction, the average velocity with which a given ion drifts through a specified gas under the influence of an electric field of unit strength. Mobilities are commonly expressed in units of centimeters per second per volt per centimeter.  
GS mobility  
. **ionic mobility** transport properties  
. **ionic mobility**  
RT ambipolar diffusion  
anions
- atomic mobilities  
cations  
electrohydrodynamics  
electrolysis  
electrolytic cells  
electromigration  
ion distribution  
ion injection  
ions  
∞ motion  
NDM semiconductor devices  
negative ions  
positive ions
- ionic propellants*  
USE **ion engines**
- ionic reactions**  
RT charge transfer  
molecular interactions
- ionic waves**  
GS elastic waves  
. **ionic waves**  
RT collisionless plasmas  
electrostatic waves  
ion cyclotron radiation  
ion motion  
ionospheric conductivity  
ionospheric propagation  
plasma waves  
∞ waves
- ionization**  
DEF The process by which electrons are lost from or transferred to neutral molecules or atoms to form positively or negatively charged particles. Used for electron ionization.  
UF *electron ionization*  
GS **ionization**  
. autoionization  
. gas ionization  
. atmospheric ionization  
. auroral ionization  
. flame ionization  
. ion production rates  
. nonequilibrium ionization  
. photoionization  
. surface ionization  
RT atomic collisions  
atomic excitations  
coronas  
disintegration  
dissociation  
electric arcs  
electric corona  
electric discharges  
electric sparks  
electron attachment  
excitation  
ion charge  
ion density (concentration)  
ion emission  
ion sources  
ionospheric composition  
magnetohydrodynamics  
molecular excitation  
oxygen recombination  
Schwarzschild metric  
single event upsets  
stellar coronas  
thermal dissociation
- ionization chambers**  
DEF Apparatus used to study the production of small ions in the atmosphere by cosmic rays and radioactive bombardment of air molecules.  
UF *ion chambers*  
GS **ionization chambers**  
. bubble chambers  
. cloud chambers  
. Geiger counters  
. proportional counters  
. spark chambers  
RT ∞ chambers  
counters  
dosimeters  
electron counters  
ionizers
- neutron counters  
radiation counters  
radiation measuring instruments  
threshold detectors (dosimeters)
- ionization coefficients**  
GS coefficients  
. **ionization coefficients**
- ionization counters*  
USE **radiation counters**
- ionization cross sections**  
RT absorption cross sections  
∞ cross sections  
nonadiabatic theory  
scattering cross sections
- ionization frequencies**  
GS frequencies  
. **ionization frequencies**
- ionization gages**  
DEF Vacuum gages with a means of ionizing the gas molecules and a means of correlating the number and type of ions produced with the pressure of the gas. Various types of ionization gages are distinguished according to the method of producing the ionization. Used for ion gages.  
UF *ion gages*  
GS measuring instruments  
. pressure gages  
. vacuum gages  
. . . **ionization gages**  
. . . . alphas  
. . . . Bayard-Alpert ionization gages  
. . . . Penning gages  
. . . . Philips ionization gages  
vacuum apparatus  
. vacuum gages  
. **ionization gages**  
. . . alphas  
. . . Bayard-Alpert ionization gages  
. . . Penning gages  
. . . Philips ionization gages  
RT hot cathodes  
Knudsen gages  
McLeod gages  
orbitrons  
Pirani gages  
pressure measurement
- ionization potentials**  
DEF The energy required to ionize an atom or molecule. The energy is usually given in terms of electron volts.  
GS potential energy  
. **ionization potentials**  
RT activation  
electric potential  
nuclear binding energy  
∞ potential  
Saha equations  
work functions
- ionized gases**  
SN (LIMITED TO PARTIALLY IONIZED GASES; SEE PLASMAS (PHYSICS) FOR COMPLETELY IONIZED MATTER)  
GS gases  
. **ionized gases**  
. . Lorentz gas particles  
. charged particles  
. **ionized gases**  
. . . Lorentz gas  
RT cosmic gases  
electron gas  
Fokker-Planck equation  
gas ionization  
gas temperature  
H II regions  
high temperature gases  
neutral gases  
. . . plasmas (physics)

## ionizers

recombination coefficient

### ionized plasmas

USE **plasmas (physics)**

### ionizers

DEF Filaments, grids, or porous bodies in ion engines or other devices which strip electrons from the outer shells of neutral atoms to form positively charged ions.

RT ∞ filaments  
gas ionization  
∞ grids  
ion engines  
ionization chambers  
surface ionization  
tube grids

### ionizing radiation

DEF Any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, in its passage through matter.

GS **ionizing radiation**  
. alpha particles  
. beta particles  
. cosmic rays  
. . cosmic ray showers  
. . galactic cosmic rays  
. . gamma ray bursts  
. . primary cosmic rays  
. . . solar cosmic rays  
. . secondary cosmic rays  
. gamma ray beams  
. gamma rays  
. . gamma ray bursts  
. x rays  
. . cosmic x rays  
. . solar x-rays

RT absorption spectra  
avalanches  
beams (radiation)  
coherent electromagnetic radiation  
corpuscular radiation  
electromagnetic radiation  
electron beams  
elementary particles  
emission  
extreme ultraviolet radiation  
fluence  
gamma ray absorption  
gamma ray spectra  
ion sources  
irradiation  
linear energy transfer (LET)  
monochromatic radiation  
nuclear radiation  
particle trajectories  
∞ radiation  
radiation belts  
radiation counters  
radiation damage  
radiation hazards  
radioactive materials  
radioactivity  
radiochemistry  
relativistic electron beams  
solar radiation  
sterilization  
system generated electromagnetic pulses

### ionograms

RT ion density (concentration)  
ionosondes  
riometers

### ionopause

SN (EXCLUDES PLASMAPAUSE)  
DEF The upper boundary of the ionosphere of certain planets (excluding the Earth) and comets where electrons decline sharply. The Earth's ionopause is referred to as the plasmopause. (Excludes plasmopause.)

RT cometary atmospheres  
planetary atmospheres  
plasmopause  
space plasmas

Venus atmosphere

### ionosondes

DEF An HF radar that sweeps or steps through all or part of the frequency range from 0.3 to 30 MHz (medium and high frequency band). Transmitting pulse modulated or continuous frequency variation signals with a vertical looking antenna, it measures the delay time of echos from the ionosphere as a function of frequency. Modern digital pulse ionosondes measure not only the amplitude, but also phase or Doppler frequency, polarization, and arrival angle of the echos.

GS measuring instruments  
. meteorological instruments  
. . radiosondes  
. . . **ionosondes**  
. sondes  
. . radiosondes  
. . . **ionosondes**  
radio equipment  
. radio transmitters  
. . radiosondes  
. . . **ionosondes**  
transmitters  
. radio transmitters  
. . radiosondes  
. . . **ionosondes**  
RT ion probes  
ionograms  
ionospheric sounding  
riometers  
satellite sounding  
sounding rockets

### Ionosphere Explorer A

USE **Explorer 20 satellite**

### ionosphere-magnetosphere coupling

USE **magnetosphere-ionosphere coupling**

### ∞ ionospheres

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED-CONSULT THE TERMS LISTED BELOW)  
RT Earth ionosphere  
magnetosphere-ionosphere coupling  
planetary ionospheres

### ionospheric absorption

USE **electromagnetic absorption ionospheric propagation**

### ionospheric blackout

USE **blackout (propagation)**

### ionospheric composition

GS composition (property)  
. atmospheric composition  
. . **ionospheric composition**  
RT atom concentration  
chemical composition  
gas composition  
ionization  
particle density (concentration)  
plasma composition  
satellite atmospheres

### ionospheric conductivity

GS electrical properties  
. electrical resistivity  
. . **ionospheric conductivity**  
transport properties  
. atmospheric conductivity  
. . **ionospheric conductivity**  
. electrical resistivity  
. . **ionospheric conductivity**

RT ∞ conductivity

electrojets  
ionic waves  
plasma conductivity

### ionospheric cross modulation

GS electromagnetic interference  
. crosstalk  
. . **ionospheric cross modulation**  
. radio frequency interference  
. . **ionospheric cross modulation**  
modulation

. **ionospheric cross modulation**

RT Luxembourg effect

### ionospheric currents

GS electric current  
. **ionospheric currents**  
. . Birkeland currents  
. . electrojets  
. . . auroral electrojets  
. . . equatorial electrojet  
. . Pedersen currents  
electricity  
. atmospheric electricity  
. . **ionospheric currents**  
. . . Birkeland currents  
. . . electrojets  
. . . . auroral electrojets  
. . . . equatorial electrojet  
. . . Pedersen currents  
RT field aligned currents  
plasma currents  
traveling ionospheric disturbances

### ionospheric disturbances

GS **ionospheric disturbances**  
. ionospheric storms  
. . sudden ionospheric disturbances  
. . traveling ionospheric disturbances  
RT Birkeland currents  
blackout (propagation)  
∞ disturbances  
ionospheric noise  
magnetic variations  
space weather

### ionospheric drift

RT ∞ drift  
drift rate  
electrojets  
magnetic rigidity  
polarization (charge separation)  
radiation belts

### ionospheric electron density

GS density (number/volume)  
. particle density (concentration)  
. . electron density (concentration)  
. . . **ionospheric electron density**  
RT Ariel 4 satellite  
magnetospheric electron density

### ionospheric F-scatter propagation

GS scattering  
. wave scattering  
. . electromagnetic scattering  
. . . **ionospheric F-scatter propagation**  
transmission  
. electromagnetic wave transmission  
. . radio transmission  
. . . ionospheric propagation  
. . . . **ionospheric F-scatter propagation**  
. . scatter propagation  
. . . **ionospheric F-scatter propagation**  
. signal transmission  
. . radio transmission  
. . . ionospheric propagation  
. . . . **ionospheric F-scatter propagation**  
. wave propagation  
. . ionospheric propagation  
. . . **ionospheric F-scatter propagation**  
. scatter propagation  
. . . **ionospheric F-scatter propagation**

### ionospheric heating

GS heating  
. **ionospheric heating**  
RT atmospheric radiation  
plasma heating

### ionospheric ion density

GS density (number/volume)  
. particle density (concentration)  
. . ion density (concentration)  
. . . **ionospheric ion density**

RT magnetospheric ion density  
positive ions

**ionospheric noise**  
GS atmospheric radiation  
. **ionospheric noise**  
. . whistlers  
electromagnetic interference  
. radio frequency interference  
. . electromagnetic noise  
. . . **ionospheric noise**  
. . . . whistlers  
RT background noise  
background radiation  
ionospheric disturbances  
riometers  
sky waves

**ionospheric propagation**  
UF *ionospheric absorption*  
*ionospheric reflection*  
GS transmission  
. electromagnetic wave transmission  
. . radio transmission  
. . . **ionospheric propagation**  
. . . . ionospheric F-scatter  
propagation  
. signal transmission  
. . radio transmission  
. . . **ionospheric propagation**  
. . . . ionospheric F-scatter  
propagation  
. wave propagation  
. . **ionospheric propagation**  
. . . ionospheric F-scatter propagation  
RT antipodes  
Earth ionosphere  
Earth-ionosphere waveguide  
EISCAT radar system (Europe)  
ionic waves  
lossy media  
Luxembourg effect  
magnetotronics  
ORBIS  
ORBIS CAL satellite  
polar radio blackout  
riometers  
scatter propagation  
signal measurement  
traveling ionospheric disturbances

*ionospheric reflection*  
USE **ionospheric propagation**

**ionospheric sounding**  
GS sounding  
. **ionospheric sounding**  
RT Alouette 1 satellite  
Alouette 2 satellite  
Alouette project  
Ariel 4 satellite  
atmospheric sounding  
ionosondes  
ORBIS  
ORBIS CAL satellite  
rocket sounding  
satellite sounding

**ionospheric storms**  
DEF Disturbances of the ionosphere, resulting in anomalous variations in its characteristics and effects on radio communication.  
GS ionospheric disturbances  
. **ionospheric storms**  
. . sudden ionospheric disturbances storms  
. **ionospheric storms**  
. . sudden ionospheric disturbances  
RT ∞ disturbances  
Earth ionosphere  
ionospheric  
noise storms  
solar storms  
spread F  
traveling ionospheric disturbances

**ionospheric temperature**  
GS temperature  
. atmospheric temperature  
. . **ionospheric temperature**

RT auroral temperature  
electron energy  
ion temperature

**ionospheric tilts**  
DEF Ionospheric conditions where the variability of the number of the electrons as a function of altitude is present. Ionospheric tilts are sometimes created by traveling ionospheric disturbances (TID's) and ionospheric tilts deflect radio waves in unexpected directions adversely affecting radio reception.  
RT traveling ionospheric disturbances

**ionospherics**  
GS electromagnetic interference  
. radio frequency interference  
. . electromagnetic noise  
. . . atmospherics  
. . . . **ionospherics**  
. . . . . dawn chorus  
. . . . . hiss  
RT ionospheric storms  
radio auroras

**ions**  
DEF Charged atoms or molecularly bound groups of atoms; sometimes also free electrons or other charged subatomic particles. In atmospheric electricity, any of several types of electrically charged submicroscopic particles normally found in the atmosphere. Atmospheric ions are of two principal types, small ions and large ions, although a class of intermediate ions has occasionally been reported. In chemistry, atoms or specific groupings of atoms which have gained or lost one or more electrons, as the chloride ion or ammonium ion. Such ions exist in aqueous solutions and in certain crystal structures.  
UF *multicharged ions*  
GS **ions**  
. cesium ions  
. deuterons  
. heavy ions  
. helium ions  
. hydrogen ions  
. light ions  
. metal ions  
. . ferric ions  
. . manganese ions  
. molecular ions  
. . formyl ions  
. . hydronium ions  
. . vanadyl radical  
. negative ions  
. . anions  
. nitrogen ions  
. oxygen ions  
. positive ions  
. . cations  
. . . formyl ions  
. . . vanadyl radical  
. . hydronium ions  
. recoil ions  
. tritons  
. trivalent ions  
RT alpha particles  
atoms  
chemical elements  
corpuscular radiation  
electrolytes  
free radicals  
hydroxyl radicals  
ion implantation  
ion plating  
ionic mobility  
molecules  
monatomic molecules  
nuclei (nuclear physics)  
particles  
plasmas (physics)  
polyatomic molecules  
protons  
valence

**Iowa**  
GS nations  
. United States  
. . **Iowa**

RT Cedar Rapids (IA)  
Missouri River (US)

*IP (impact prediction)*  
USE **computerized simulation**

**IPAD**  
SN (INTEGRATED PROGRAM FOR AEROSPACE VEHICLE DESIGN)  
UF *Integ Program for Aerospace Veh Design*  
GS computer techniques  
. computer aided design  
. . **IPAD**  
spacecraft design  
. **IPAD**  
RT ∞ design

*IPG (NASA Information Power Grid)*  
(added December 2003)  
USE **grid computing (computer networks)**

*IQSY (international year)*  
USE **International Quiet Sun Year**

*IR lasers*  
USE **infrared lasers**

**Iran**  
GS nations  
. **Iran**  
RT Asia

**Iraq**  
GS nations  
. **Iraq**  
RT Asia

*IRAS*  
USE **Infrared Astronomy Satellite**

**IRAS-Araki-Alcock comet**  
DEF The closest known approaching comet to the Earth since 1770, it was the fourth comet discovered in 1983 and is named after its first three discoverers: The infrared astronomy satellite, Genichi Araki (a Japanese school teacher) and George Alcock (a veteran English amateur observer).  
GS celestial bodies  
. comets  
. . **IRAS-Araki-Alcock comet**  
RT Infrared Astronomy Satellite  
solar system

*irasers*  
USE **infrared lasers**

*IRBM (missiles)*  
USE **intermediate range ballistic missiles**

**Ireland**  
GS landforms  
. islands  
. . **Ireland**  
nations  
. **Ireland**

**iridescence**  
GS electromagnetic properties  
. optical properties  
. . color  
. . . **iridescence**  
RT opalescence

**iridium**  
GS chemical elements  
. **iridium**  
. . iridium isotopes  
metals  
. refractory metals  
. . **iridium**  
. . . iridium isotopes  
. transition metals  
. . **iridium**  
. . . iridium isotopes  
refractory materials  
. refractory metals  
. . **iridium**



... Sikhote-Alin meteorite  
 RT achondrites  
 Harleton meteorite  
 kamacite  
 meteoritic composition  
 meteoritic microstructures  
 Okhansk meteorite  
 schreibersite  
 stony meteorites  
 stony-iron meteorites  
 troilite  
 Widmanstätten structure

**iron ores**  
 GS minerals  
 . iron ores  
 . . hematite

**iron oxides**  
 GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . iron oxides  
 . . . . hematite  
 . . . . ilmenite  
 . . . . magnetite  
 iron compounds  
 . iron oxides  
 . . hematite  
 . . ilmenite  
 . . magnetite

*Iroquois helicopter*  
 USE **UH-1 helicopter**

**irradiance**  
 SN (LIMITED TO DETECTION RATE PER UNIT AREA OF RADIATION)  
 DEF The detection rate per unit area of radiation.  
 GS rates (per time)  
 . flux density  
 . . radiant flux density  
 . . . irradiance  
 . . . . illuminance  
 . . . . solar constant  
 RT electron flux density  
 luminance  
 luminous intensity  
 neutron flux density  
 photosynthetically active radiation  
 proton flux density  
 radiance  
 Solar Backscatter UV Spectrometer  
 solar flux density

**irradiation**  
 GS **irradiation**  
 . auroral irradiation  
 . electron irradiation  
 . ion irradiation  
 . . deuteron irradiation  
 . . proton irradiation  
 . neutron irradiation  
 . x ray irradiation  
 RT activation  
 beams (radiation)  
 ∞ bombardment  
 dosimeters  
 electromagnetic absorption  
 electron probes  
 emission  
 excitation  
 exposure  
 flux density  
 ionizing radiation  
 laser induced fluorescence  
 nuclear capture  
 nuclear fusion  
 nuclear radiation  
 preserving  
 ∞ radiation  
 radiation dosage  
 radiation effects  
 radiation measurement  
 radiation tolerance  
 radiobiology  
 radiography

targets

**irrationality**  
 RT disorientation  
 dithers  
 mental performance  
 prejudices  
 psychoses  
 schizophrenia

**irregular galaxies**  
 DEF Galaxies with amorphous structure and with relatively low mass (10 to the 8th to 10 to the 10th solar masses). Fewer than 10 percent of all galaxies are classified as irregular.  
 GS celestial bodies  
 . galaxies  
 . . **irregular galaxies**  
 RT BL Lacertae objects  
 galactic radiation  
 galactic rotation  
 galactic structure  
 Gum nebula  
 Hubble constant  
 Hubble diagram  
 nebulae  
 Orion nebula  
 Population I stars  
 quasars  
 radio sources (astronomy)  
 red shift  
 star clusters  
 stars

**irregular variable stars**  
 GS celestial bodies  
 . stars  
 . . variable stars  
 . . . **irregular variable stars**  
 . . . . R Coronae Borealis stars  
 RT carbon stars  
 semiregular variable stars

**irregularities**  
 RT abnormalities  
 defects  
 deviation  
 nonuniformity  
 regularity

**irreversible processes**  
 RT nonequilibrium thermodynamics  
 Onsager relationship  
 reaction kinetics  
 thermodynamics  
 thermoviscoelasticity  
 variational principles

**irrigation**  
 RT agriculture  
 alfalfa  
 barley  
 canals  
 citrus trees  
 corn  
 crop vigor  
 ditches  
 drainage  
 drainage patterns  
 farm crops  
 farmlands  
 oats  
 orchards  
 ponds  
 seepage  
 sugar beets  
 sugar cane  
 troughs  
 vegetation growth  
 vineyards  
 water consumption

**irritation**  
 GS **irritation**  
 . toxicity and safety hazard

RT ∞ reaction

*irrotational flow*  
 USE **potential flow**

*IRS (Indian spacecraft)*  
 USE **Indian spacecraft**

*ISAGEX*  
 USE **International Satellite Geodesy Experiment**

**ISCCP Project**  
 (added August 1991)  
 UF *International Satellite Cloud Climatology*  
 GS programs  
 . projects  
 . . **ISCCP Project**  
 RT climatology  
 cloud cover  
 clouds (meteorology)  
 GOES satellites  
 METEOSAT satellite  
 remote sensing  
 satellite observation

**ischemia**  
 RT anemias  
 blood circulation  
 congestion  
 vasoconstriction

*ISEE*  
 USE **International Sun Earth Explorers**

**isentrope**  
 DEF A line of equal or constant pressure, with respect to either space or time.  
 RT adiabatic conditions  
 isentropic processes  
 Mollier diagram  
 Poisson equation

**isentropic processes**  
 GS **isentropic processes**  
 . nonisentropicity  
 RT Bernoulli theorem  
 isentrope  
 isoenergetic processes  
 isopycnic processes  
 ∞ processes  
 thermodynamic equilibrium

**Ising model**  
 RT antiferromagnetism  
 cluster variation method  
 crystal lattices  
 ferromagnetism  
 particle spin  
 phase transformations  
 statistical mechanics

**ISIS satellites**  
 SN (INTERNATIONAL SATELLITES FOR IONOSPHERIC STUDY)  
 UF *International Sats for Ionospheric Study*  
 GS artificial satellites  
 . **ISIS satellites**  
 . . Alouette 2 satellite  
 . . ISIS-A  
 . . ISIS-B  
 . . ISIS-X  
 RT Alouette satellites

**ISIS-A**  
 GS artificial satellites  
 . ISIS satellites  
 . . **ISIS-A**  
 RT Alouette project

**ISIS-B**  
 GS artificial satellites  
 . ISIS satellites  
 . . **ISIS-B**

**ISIS-X**  
 GS artificial satellites  
 . ISIS satellites  
 . . **ISIS-X**

## island arcs

RT Alouette B satellite

*Iskra aircraft*

USE **TS-11 aircraft**

### island arcs

GS landforms

. island arcs

RT Aleutian Islands (US)

∞ arcs

barriers (landforms)

islands

keys (islands)

lagoons

reefs

### islands

DEF Tracts of land smaller than a continent, surrounded by the water of oceans, seas, lakes, or streams. The term has been loosely applied to land-tied and submerged areas, and to land cut off on two or more sides by water, such as peninsulas.

GS landforms

. islands

.. Aleutian Islands (US)

.. Assateague Island (MD-VA)

.. atolls

.. Azores

.. Bahrain

.. Bermuda

.. Canary Islands

.. Cyprus

.. Greenland

.. Hawaii

.. Iceland

.. Indonesia

.. Ireland

.. keys (islands)

.. Long Island (NY)

.. Madagascar

.. Maldiv Islands

.. Malta

.. Mauritius

.. Merritt Island (FL)

.. Newfoundland

.. nunataks

.. Pacific islands

.. . Guam

.. . Japan

.. . Johnston Island

.. . Kurile Islands

.. . New Guinea (island)

.. . New Zealand

.. . Philippines

.. . Samoa

.. . Prince Edward Island

.. Seychelles

.. Sicily

.. Tasmania

.. Wallops Island

.. West Indies

.. . Antigua and Barbuda

.. . Bahamas

.. . Barbados

.. . Cuba

.. . Dominica

.. . Grenada

.. . Guadeloupe

.. . Haiti

.. . Jamaica

.. . Lesser Antilles

.. . Martinique

.. . Puerto Rico

.. . Trinidad and Tobago

.. . Virgin Islands

RT archipelagoes

Cape Verde

coral reefs

island arcs

lagoons

Outer Banks (NC)

reefs

seamounts

*ISMU (resource utilization)*

(added August 2001)

USE **in situ resource utilization**

∞ **isobars**

SN (USE OF A MORE SPECIFIC TERM IS

RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT baroclinity

barotropism

isobars (pressure)

nuclear isobars

polytropic processes

### isobars (pressure)

DEF Lines of equal or constant pressure, specifically, such lines on a weather map.

RT atmospheric pressure

geostrophic wind

gradients

∞ isobars

isochoric processes

isopycnic processes

isothermal processes

meteorological charts

pressure

pressure distribution

pressure gradients

*isobutane*

(added March 1996)

USE **butanes**

*isobutylene*

USE **butenes**

### isochoric processes

RT isobars (pressure)

isopycnic processes

thermodynamic equilibrium

volume

### isochromatics

RT color

dichroism

diffraction

interferometry

refraction

speckle interferometry

### isocyanates

GS esters

. **isocyanates**

.. diisocyanates

.. fulminates

nitrogen compounds

. cyano compounds

.. **isocyanates**

... diisocyanates

... fulminates

### isoelectronic sequence

RT atomic structure

spectra

spectroscopy

### isoenergetic processes

RT adiabatic conditions

isentropic processes

thermodynamic equilibrium

### isolation

GS **isolation**

. social isolation

RT confinement

confining

deprivation

disposal

exclusion

gnotobiotics

insulation

isolators

∞ separation

spacing

### isolators

GS **isolators**

. vibration isolators

RT attenuators

insulation

isolation

noise reduction

shock absorbers

spacers

suppressors

vibration

### isomerization

DEF Process for converting hydrocarbon or other organic compound to an isomer.

GS **isomerization**

. ortho para conversion

RT ∞ conversion

refining

### isomers

DEF Nuclides having the same mass number A and atomic number Z, but existing for measurable times in different quantum states with different energies and radioactive properties. Molecules having the same atomic composition and molecular weight, but differing in geometrical configuration.

GS **isomers**

. enantiomers

RT atoms

congeners

isopropyl alcohol

nuclear chemistry

phenanthrene

stereochemistry

tautomers

### isomorphism

UF *morphotropism*

GS morphology

. **isomorphism**

RT

crystal lattices

crystal structure

duality theorem

enantiomers

homomorphisms

### isoparametric finite elements

DEF The basis for the calculation of physical properties of structural shapes including stress analyses.

RT conformal mapping

coordinate transformations

∞ elements

finite element method

fracture mechanics

numerical analysis

stress analysis

### isoperimetric problem

RT analytic functions

continuity (mathematics)

Lagrange multipliers

matrices (mathematics)

∞ problems

topology

### isophotes

RT ∞ illumination

*isopleths*

USE **nomographs**

### isopropyl alcohol

GS hydroxyl compounds

. alcohols

.. **isopropyl alcohol**

isopropyl compounds

. **isopropyl alcohol**

RT isomers

### isopropyl compounds

GS **isopropyl compounds**

. isopropyl alcohol

RT ∞ chemical compounds

### isopropyl nitrate

GS alkyl compounds

. **isopropyl nitrate**

esters

. nitrate esters

.. **isopropyl nitrate**

nitrogen compounds

. nitrate esters

.. **isopropyl nitrate**

### isopycnic processes

UF *isosteric processes*

RT density (mass/volume)

isentropic processes

isobars (pressure)  
isochoric processes

**isostasy**

DEF A supposed equality existing in vertical sections of the Earth, whereby the weight of any column from the surface of the Earth to a constant depth is approximately the same as that of any other column of equal area, the equilibrium being maintained by plastic flow from one part of the Earth to another.

RT  $\infty$  equilibrium  
geomorphology  
geophysics  
glaciology  
gravitation  
hydrostatics  
orography  
seismology  
subsidence

**isostatic pressure**

GS pressure  
. **isostatic pressure**  
RT atmospheric pressure  
hot isostatic pressing  
hydrostatic pressure  
static pressure

*isosteric processes*

USE **isopycnic processes**

**isotensoid structures**

DEF Filamentary structures in which the filaments are uniformly stressed throughout for the design loading conditions.

RT composite wrapping  
filament winding  
pressure vessels  
prestressing  
shells (structural forms)  
spiral wrapping  
 $\infty$  structures  
tensegrity structures

**isothermal flow**

GS fluid flow  
. **isothermal flow**  
RT flow distribution  
isotherms  
temperature distribution

**isothermal layers**

RT isotherms  
laminar boundary layer  
stratosphere  
stratospheric warming  
temperature distribution  
temperature gradients  
thermal mapping  
tropopause

**isothermal processes**

DEF Thermodynamic changes of state of a system that take place at constant temperature.

RT adiabatic conditions  
isobars (pressure)  
isotherms  
thermodynamic equilibrium

**isotherms**

DEF Lines connecting points of equal temperature.

RT Atmospheric & Oceanographic Inform  
Sys  
atmospheric temperature  
gradients  
isothermal flow  
isothermal layers  
isothermal processes  
meteorological parameters  
meteorology  
temperature  
temperature distribution  
temperature gradients  
thermal mapping  
thermodynamics

**isotonicity**

RT body fluids

osmosis

*isotope abundance ratios*

USE **isotope ratios**

**isotope effect**

UF *isotope shift*  
RT  $\infty$  effects  
isotopes  
radioactive isotopes

**isotope ratios**

(added March 1995)

UF *isotope abundance ratios*  
*isotopic analysis (quantitative)*

GS composition (property)

. **isotope ratios**

ratios

. **isotope ratios**

RT atmospheric composition  
cosmochemistry  
geochemistry  
geochronology  
interstellar chemistry  
meteoritic composition  
stellar composition

**isotope separation**

RT atoms  
heavy ions  
ion exchanging  
ion extraction  
isotopes  
jet membrane process

*isotope shift*

USE **isotope effect**

**isotopes**

DEF Different forms of the same chemical element that differ only by the number of neutrons in their nucleus. Most elements have more than one naturally occurring isotope.

GS chemical elements

. nuclides

. . **isotopes**

. . . aluminum isotopes  
. . . . aluminum 26  
. . . . aluminum 27  
. . . antimony isotopes  
. . . argon isotopes  
. . . arsenic isotopes  
. . . barium isotopes  
. . . beryllium isotopes  
. . . . beryllium 7  
. . . . beryllium 9  
. . . . beryllium 10  
. . . bismuth isotopes  
. . . boron isotopes  
. . . . boron 10  
. . . bromine isotopes  
. . . cadmium isotopes  
. . . calcium isotopes  
. . . carbon isotopes  
. . . . carbon 12  
. . . . carbon 13  
. . . . carbon 14  
. . . cerium isotopes  
. . . . cerium 137  
. . . . cerium 144  
. . . cesium isotopes  
. . . . cesium 133  
. . . . cesium 134  
. . . . cesium 137  
. . . . cesium 144  
. . . cesium vapor  
. . . chromium isotopes  
. . . cobalt isotopes  
. . . . cobalt 58  
. . . . cobalt 60  
. . . dysprosium isotopes  
. . . erbium isotopes  
. . . europium isotopes  
. . . fluorine isotopes  
. . . gadolinium isotopes  
. . . gallium isotopes  
. . . germanium isotopes  
. . . gold isotopes  
. . . . gold 198  
. . . hafnium isotopes

. . . helium isotopes  
. . . holmium isotopes  
. . . hydrogen isotopes  
. . . . deuterium  
. . . . hydrogen 4  
. . . . metallic hydrogen  
. . . . tritium  
. . . iodine isotopes  
. . . . iodine 125  
. . . . iodine 131  
. . . . iodine 132  
. . . iridium isotopes  
. . . iron isotopes  
. . . . iron 57  
. . . . iron 58  
. . . . iron 59  
. . . krypton isotopes  
. . . . krypton 85  
. . . lanthanum isotopes  
. . . lead isotopes  
. . . lithium isotopes  
. . . lutetium  
. . . . lutetium isotopes  
. . . magnesium isotopes  
. . . manganese isotopes  
. . . mercury isotopes  
. . . molybdenum isotopes  
. . . neodymium isotopes  
. . . neon isotopes  
. . . nickel isotopes  
. . . niobium isotopes  
. . . . niobium 95  
. . . nitrogen isotopes  
. . . . nitrogen 15  
. . . . nitrogen 16  
. . . nobelium isotopes  
. . . osmium isotopes  
. . . oxygen isotopes  
. . . . oxygen 17  
. . . . oxygen 18  
. . . palladium isotopes  
. . . phosphorus isotopes  
. . . . phosphorus 32  
. . . platinum isotopes  
. . . polonium isotopes  
. . . . polonium 208  
. . . . polonium 209  
. . . . polonium 210  
. . . potassium isotopes  
. . . . potassium 38  
. . . . potassium 39  
. . . . potassium 40  
. . . praseodymium isotopes  
. . . promethium isotopes  
. . . protactinium isotopes  
. . . radioactive isotopes  
. . . . astatine isotopes  
. . . . beryllium 7  
. . . . beryllium 9  
. . . . beryllium 10  
. . . carbon 14  
. . . . cerium 137  
. . . . cerium 144  
. . . . cesium 134  
. . . . cesium 137  
. . . . cesium 144  
. . . cobalt 58  
. . . . cobalt 60  
. . . . copper isotopes  
. . . . gold 198  
. . . . indium isotopes  
. . . . iodine 125  
. . . . iodine 131  
. . . . iodine 132  
. . . . iron 59  
. . . . krypton 85  
. . . . niobium 95  
. . . . nitrogen 16  
. . . . phosphorus 32  
. . . . polonium 208  
. . . . polonium 209  
. . . . polonium 210  
. . . . potassium 38  
. . . . potassium 40  
. . . . rubidium 86  
. . . . sodium 22  
. . . . sodium 24  
. . . . strontium 85  
. . . . strontium 88



## isotopic enrichment

. . . . strontium 89  
 . . . . strontium 90  
 . . . . transuranium elements  
 . . . . . americium  
 . . . . . americium isotopes  
 . . . . . . . americium 241  
 . . . . . berkelium  
 . . . . . californium  
 . . . . . californium isotopes  
 . . . . . curium  
 . . . . . curium isotopes  
 . . . . . . . curium 242  
 . . . . . . . curium 244  
 . . . . . einsteinium  
 . . . . . fermium  
 . . . . . lawrencium  
 . . . . . mendelevium  
 . . . . . neptunium  
 . . . . . neptunium isotopes  
 . . . . . nobelium  
 . . . . . plutonium  
 . . . . . plutonium isotopes  
 . . . . . . . plutonium 238  
 . . . . . . . plutonium 239  
 . . . . . . . plutonium 240  
 . . . . . . . plutonium 241  
 . . . . . . . plutonium 244  
 . . . . . sergenium  
 . . . . . tritium  
 . . . . . uranium 232  
 . . . . . uranium 233  
 . . . . . uranium 238  
 . . . . . xenon 133  
 . . . . . xenon 135  
 . . . . . zirconium 95  
 . . . . . radium isotopes  
 . . . . . radium 226  
 . . . . . radon isotopes  
 . . . . . rhenium isotopes  
 . . . . . rhodium isotopes  
 . . . . . rubidium isotopes  
 . . . . . rubidium 86  
 . . . . . ruthenium isotopes  
 . . . . . samarium isotopes  
 . . . . . scandium isotopes  
 . . . . . selenium isotopes  
 . . . . . silicon isotopes  
 . . . . . silver isotopes  
 . . . . . sodium isotopes  
 . . . . . sodium 22  
 . . . . . sodium 24  
 . . . . . strontium isotopes  
 . . . . . . . strontium 85  
 . . . . . . . strontium 87  
 . . . . . . . strontium 89  
 . . . . . . . strontium 90  
 . . . . . sulfur isotopes  
 . . . . . tantalum isotopes  
 . . . . . technetium isotopes  
 . . . . . tellurium  
 . . . . . tellurium isotopes  
 . . . . . terbium isotopes  
 . . . . . thallium isotopes  
 . . . . . thorium isotopes  
 . . . . . thulium isotopes  
 . . . . . tin isotopes  
 . . . . . titanium isotopes  
 . . . . . tungsten isotopes  
 . . . . . uranium isotopes  
 . . . . . . . uranium 232  
 . . . . . . . uranium 233  
 . . . . . . . uranium 234  
 . . . . . . . uranium 235  
 . . . . . . . uranium 238  
 . . . . . vanadium isotopes  
 . . . . . xenon isotopes  
 . . . . . . . xenon 129  
 . . . . . . . xenon 133  
 . . . . . . . xenon 135  
 . . . . . ytterbium isotopes  
 . . . . . yttrium isotopes  
 . . . . . zinc isotopes  
 . . . . . zirconium isotopes  
 . . . . . zirconium 95  
 RT atoms  
 heavy ions  
 isotope effect  
 isotope separation  
 isotopic enrichment

isotopic labeling  
 jet membrane process  
 metals  
 nuclear isobars  
 nuclei (nuclear physics)  
 radioactive materials  
 isotopic analysis (quantitative)  
 USE **isotope ratios**  
**isotopic enrichment**  
 DEF Process by which the relative abundance of the isotopes of a given element are altered in a batch to produce a form of the element enriched in a particular isotope.  
 GS enrichment  
 . **isotopic enrichment**  
 . . jet membrane process  
 RT beneficiation  
 chemical elements  
 ∞ concentration  
 isotopes  
 nuclides  
**isotopic labeling**  
 GS marking  
 . **isotopic labeling**  
 RT chemical analysis  
 isotopes  
 radioactive isotopes  
 radiochemistry  
 trace elements  
 ∞ tracers  
**isotopic spin**  
 GS spin  
 . particle spin  
 . . **isotopic spin**  
**isotopic media**  
 GS isotropy  
 . **isotopic media**  
 RT anisotropic media  
**isotropic turbulence**  
 DEF Turbulence in which the products and squares of the velocity components and their derivatives are independent of direction, or, more precisely, invariant with respect to rotation and reflection of the coordinate axes in a coordinate system moving with the mean motion of the fluid.  
 GS turbulence  
 . **isotropic turbulence**  
 RT atmospheric turbulence  
 coordinate transformations  
 homogeneous turbulence  
 instrument receivers  
 invariant imbeddings  
 Kolmogorov theory  
 magnetohydrodynamic turbulence  
 turbulent flow  
**isotropism**  
 RT refractivity  
 symmetry  
**isotropy**  
 DEF Having the same properties in all directions. Used for spatial isotropy.  
 UF *spatial isotropy*  
 GS **isotropy**  
 . isotropic media  
 RT anisotropic fluids  
 anisotropy  
 Bragg angle  
 crystal structure  
 crystallography  
 crystals  
 dendritic crystals  
 directivity  
 field strength  
 mechanical properties  
 metallography  
 optical properties  
 ∞ orientation  
 ∞ physical properties  
**Israel**  
 GS nations

. **Israel**  
 RT Asia  
 Israeli space program  
 Israeli spacecraft  
**Israeli space program**  
 (added March 1989)  
 GS programs  
 . space programs  
 . . **Israeli space program**  
 RT Israel  
 Israeli spacecraft  
**Israeli spacecraft**  
 (added May 1993)  
 RT Israel  
 Israeli space program  
 ∞ spacecraft  
**ISRO**  
 UF *Indian Space Research Organization*  
 GS organizations  
 . **ISRO**  
 RT India  
 space programs  
*ISRU (resource utilization)*  
 (added August 2001)  
 USE **in situ resource utilization**  
*ISS (space station)*  
 (added June 2000)  
 USE **International Space Station**  
**isthmuses**  
 DEF Narrow strips or necks of land, bordering on both sides by water, connecting two larger land areas, such as peninsulas and the mainland or two continents (Isthmus of Panama).  
 GS land  
 . **isthmuses**  
 landforms  
 . **isthmuses**  
 RT geology  
 oceanography  
 peninsulas  
 topography  
 water  
*ISY*  
 USE **International Space Year**  
**Italian space program**  
 GS programs  
 . space programs  
 . . European space programs  
 . . . **Italian space program**  
 RT Italy  
 Orbiting Frog Otolith  
 SIRIO satellite  
**Italy**  
 GS nations  
 . **Italy**  
 RT Adriatic Sea  
 Alps Mountains (Europe)  
 Europe  
 Italian space program  
 San Marino  
 Sicily  
 SIRIO satellite  
 Vatican City  
**itching**  
 RT contact dermatitis  
 dermatitis  
 histamines  
 sensitivity  
 sensory perception  
**iteration**  
 GS analysis (mathematics)  
 . numerical analysis  
 . . **iteration**  
 . . . conjugate gradient method  
 . . . iterative solution  
 . . . Newton methods  
 . . . Newton-Raphson method  
 . . . predictor-corrector methods  
 RT multigrid methods  
 probability theory

- problem solving
- iterative networks**
- GS circuits
    - . **iterative networks**
    - networks
    - . **iterative networks**
  - RT impedance matching
- iterative solution**
- GS analysis (mathematics)
    - . numerical analysis
    - . . iteration
    - . . . **iterative solution**
    - problem solving
    - . **iterative solution**
  - RT asymptotic methods
    - Cholesky factorization
    - conjugate gradient method
    - finite element method
    - ill-posed problems (mathematics)
    - multigrid methods
    - Newton methods
    - predictor-corrector methods
    - sorting algorithms
    - strange attractors
- ITO (semiconductors)**
- DEF Semiconductor devices consisting of a layer of tin sandwiched between an indium layer and an oxide layer. Used for indium-tin-oxide semiconductors.
  - UF *indium-tin-oxide semiconductors*
  - GS electronic equipment
    - . solid state devices
    - . . semiconductor devices
    - . . . metal oxide semiconductors
    - . . . . **ITO (semiconductors)**
    - semiconductors (materials)
    - . metal oxide semiconductors
    - . . **ITO (semiconductors)**
  - RT charge coupled devices
    - charge transfer devices
    - CMOS
    - heterojunction devices
    - ion implantation
    - rectifiers
- SOS (semiconductors)
- ITOS 1**
- GS artificial satellites
    - . meteorological satellites
    - . . TIROS satellites
    - . . . ITOS satellites
    - . . . . **ITOS 1**
  - RT TIROS M
    - TIROS N series satellites
    - TIROS operational satellite system
- ITOS 2**
- GS artificial satellites
    - . meteorological satellites
    - . . TIROS satellites
    - . . . ITOS satellites
    - . . . . **ITOS 2**
  - RT TIROS M
    - TIROS N series satellites
    - TIROS operational satellite system
- ITOS 3**
- GS artificial satellites
    - . meteorological satellites
    - . . TIROS satellites
    - . . . ITOS satellites
    - . . . . **ITOS 3**
  - RT TIROS M
    - TIROS N series satellites
    - TIROS operational satellite system
- ITOS 4**
- GS artificial satellites
    - . meteorological satellites
    - . . TIROS satellites
    - . . . ITOS satellites
    - . . . . **ITOS 4**
  - RT TIROS M
    - TIROS N series satellites
    - TIROS operational satellite system
- ITOS satellites**
- (added August 1990)
- DEF Second generation, polar orbiting, environmental satellite used to augment NOAA's world-wide weather observation capabilities.
- UF *Improved TIROS Operational Satellites*
- GS artificial satellites
  - . meteorological satellites
  - . . TIROS satellites
  - . . . **ITOS satellites**
  - . . . . ITOS 1
  - . . . . ITOS 2
  - . . . . ITOS 3
  - . . . . ITOS 4
- RT TIROS M
  - TIROS N series satellites
- IUE**
- UF *International Ultraviolet Explorer SAS-D*
  - GS artificial satellites
    - . scientific satellites
    - . . astronomical satellites
    - . . . **IUE**
    - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . **IUE**
  - RT Explorer satellites
    - Extreme Ultraviolet Explorer satellite
    - radio astronomy
    - spaceborne astronomy
    - ultraviolet radiation
- IUS**
- USE **Inertial Upper Stage**
- Ivory Coast*
- USE **Cote d'Ivoire**
- Ivuna meteorite**
- GS celestial bodies
    - . meteorites
    - . . stony meteorites
    - . . . carbonaceous meteorites
    - . . . . carbonaceous chondrites
    - . . . . . **Ivuna meteorite**
    - . . . . chondrites
    - . . . . carbonaceous chondrites
    - . . . . . **Ivuna meteorite**
- Izsak ellipsoid*
- USE **ellipsoids**
- geodesy**

# J

## J integral

DEF A contour energy integral formulated by Rice and used for evaluating fracture toughness of elastoplastic materials.

- GS analysis (mathematics)
  - . functional analysis
  - . integral equations
  - . . . **J integral**
  - . real variables
  - . measure and integration
  - . . . **J integral**
- RT crack initiation
  - crack propagation
  - crack propagation
  - cracking (fracturing)
  - creep rupture strength
  - elastoplasticity
  - fracture mechanics
  - fracture strength
  - integral calculus
  - mechanical properties
  - plastic deformation
  - structural analysis
  - toughness
  - yield strength

## J-2 engine

- GS engines
  - . rocket engines
  - . liquid propellant rocket engines
  - . . . hydrogen oxygen engines
  - . . . . **J-2 engine**
- RT Ares 1 upper stage
  - Ares 5 cargo launch vehicle
  - Nova launch vehicles
  - Saturn 1B launch vehicles
  - Saturn 5 launch vehicles

## J-33 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-33 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-33 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-33 engine**
  - turbomachinery
  - . **J-33 engine**
- RT Mace missiles

## J-34 engine

- UF *XJ-34-WE-32 engine*
- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-34 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-34 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-34 engine**

## J-47 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-47 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines

- . . . . **J-47 engine**
- . turbine engines
- . gas turbine engines
- . jet engines
- . . . turbojet engines
- . . . . **J-47 engine**

## J-52 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-52 engine**
  - . aircraft engines
  - . **J-52 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-52 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-52 engine**

## J-57 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-57 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-57 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-57 engine**
- RT afterburning

## J-58 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-58 engine**
  - . aircraft engines
  - . **J-58 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-58 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-58 engine**

## J-65 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-65 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-65 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-65 engine**
- RT A-4 aircraft

## J-69-T-25 engine

- UF *Marbore 2 engine*
- GS engines
  - . air breathing engines

- . gas turbine engines
- . jet engines
- . . . turbojet engines
- . . . . **J-69-T-25 engine**
- . internal combustion engines
- . gas turbine engines
- . jet engines
- . . . turbojet engines
- . . . . **J-69-T-25 engine**
- . turbine engines
- . gas turbine engines
- . jet engines
- . . . turbojet engines
- . . . . **J-69-T-25 engine**

## J-71 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-71 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-71 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-71 engine**

## J-73 engine

- UF *YJ-73-GE-3 engine*
- GS engines
  - . *YJ73 turbojet engine*
  - . engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-73 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-73 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-73 engine**

## J-75 engine

- GS engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-75 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-75 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-75 engine**

## J-79 engine

- UF *XJ-79-GE-1 engine*
- GS engines
  - . *YJ-79 engine*
  - . engines
  - . air breathing engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-79 engine**
  - . internal combustion engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-79 engine**
  - . turbine engines
  - . gas turbine engines
  - . jet engines
  - . . . turbojet engines
  - . . . . **J-79 engine**

- . . . . turbojet engines
- . . . . **J-79 engine**
- RT F-4 aircraft
- J-85 engine**
- UF *YJ-85 engine*
- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-85 engine**
  - . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-85 engine**
  - . turbine engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-85 engine**
- RT Blue Goose missile  
Osprey missile
- J-93 engine**
- UF *J93-MJ252H engine*  
*J93-MJ280G engine*  
*YJ-93 engine*  
*YJ-93-GE-3 engine*
- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-93 engine**
  - . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-93 engine**
  - . turbine engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . **J-93 engine**
- J93-MJ252H engine*  
USE **J-93 engine**
- J93-MJ280G engine*  
USE **J-93 engine**
- J-97 engine**
- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turbofan engines
  - . . . . . **J-97 engine**
  - . aircraft engines
  - . . **J-97 engine**
  - . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turbofan engines
  - . . . . . **J-97 engine**
  - . turbine engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turbofan engines
  - . . . . . **J-97 engine**
- Jabiru rocket vehicle*  
USE **Jaguar rocket vehicle**
- jackets**
- SN (EXCLUDES CLOTHING)
- DEF Coverings or casings of some kind. Specifically, a shell around the combustion chamber of a liquid fuel rocket, through which the propellant is circulated in regenerative cooling. Coatings of one material over another to prevent damage such as oxidation or micrometeoroid penetration.
- RT absorbers (materials)
- ∞ casing
- cooling
- coverings
- heating
- insulation
- linings
- sheaths
- jacking equipment*  
USE **jacks (lifts)**
- ∞ **jacks**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT electric connectors  
elevators (lifts)  
jacks (lifts)
- jacks (electrical)*  
USE **electric connectors**
- jacks (lifts)**
- UF *jacking equipment*
- RT ∞ jacks
- ∞ lifts
- positioning devices (machinery)
- tunneling (excavation)
- Jacobi integral**
- GS analysis (mathematics)
  - . real variables
  - . . **Jacobi integral**
- RT conformal mapping  
diffusion theory  
elliptic functions  
Green's functions  
potential theory  
Weierstrass functions
- Jacobi matrix method**
- GS analysis (mathematics)
  - . real variables
  - . . **Jacobi matrix method**
- RT calculus of variations  
eigenvalues  
eigenvectors  
Hermitian polynomial
- ∞ methodology
- Jacobi polynomials*  
USE **hypergeometric functions**
- Jaguar aircraft**
- GS attack aircraft
  - . fighter aircraft
  - . . **Jaguar aircraft**
  - . single engine aircraft
  - . . **Jaguar aircraft**
  - . supersonic aircraft
  - . . **Jaguar aircraft**
- RT ∞ aircraft  
Breguet aircraft
- ∞ military aircraft
- Jaguar rocket vehicle**
- UF *Jabiru rocket vehicle*
- GS rocket vehicles
  - . multistage rocket vehicles
  - . . **Jaguar rocket vehicle**
  - . . sounding rockets
  - . . . **Jaguar rocket vehicle**
- RT solid propellant rocket engines
- Jahn-Teller effect**
- DEF The effect whereby, except for linear molecules, degenerate orbital states in molecules are unstable.
- RT ∞ effects
- electron paramagnetic resonance
- electron transitions
- orbitals
- Jamaica**
- GS landforms
  - . islands
  - . . West Indies
  - . . . **Jamaica**
  - . nations
  - . . **Jamaica**
- RT Caribbean region
- James Webb Space Telescope**  
(added October 2003)
- DEF Orbiting infrared observatory comprised of an optical telescope element, integrated science instrument module, and a space support module. Successor telescope to the Hubble Space Telescope.
- UF *JWST (observatory)*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . **James Webb Space Telescope**
  - . observatories
  - . . astronomical observatories
  - . . . astronomical satellites
  - . . . . **James Webb Space Telescope**
  - . telescopes
  - . . spaceborne telescopes
  - . . . **James Webb Space Telescope**
- RT Hubble Space Telescope  
infrared astronomy  
infrared telescopes  
Next Generation Space Telescope project  
spaceborne astronomy
- jammers**
- RT air defense  
jamming  
radar equipment  
radio equipment
- jamming**
- DEF Intentional transmission or reradiation of radio signals in such a way as to interfere with reception of desired signals by the intended receiver.
- GS countermeasures
  - . **jamming**
  - . electromagnetic interference
  - . **jamming**
- RT clutter  
electronic countermeasures  
electronic warfare  
frequency hopping
- ∞ interference  
jammers  
radio frequency interference  
space-time adaptive processing  
white noise
- Janus**
- DEF One of the natural satellites of Saturn.
- GS celestial bodies
  - . natural satellites
  - . . Saturn satellites
  - . . . **Janus**
- RT Saturn (planet)
- Janus Reactor**
- GS nuclear reactors
  - . nuclear research and test reactors
  - . . **Janus Reactor**
- Janus spacecraft**
- GS gliders
  - . **Janus spacecraft**
  - . lifting bodies
  - . . lifting reentry vehicles
  - . . . **Janus spacecraft**
  - . maneuverable spacecraft
  - . . **Janus spacecraft**
  - . manned spacecraft
  - . . **Janus spacecraft**
  - . reentry vehicles
  - . . maneuverable reentry bodies
  - . . . lifting reentry vehicles
  - . . . . **Janus spacecraft**
  - . . . . soft landing spacecraft
  - . . . . **Janus spacecraft**
- Japan**
- GS landforms
  - . islands
  - . . Pacific islands
  - . . . **Japan**
  - . nations
  - . . **Japan**

## Japanese space program

RT Asia  
Japanese space program  
Japanese spacecraft

### Japanese space program

GS programs  
. space programs  
. . **Japanese space program**

RT Ginga satellite  
HOPE aerospace plane  
Japan  
Japanese spacecraft  
Kibo Japanese Experiment Module  
meteorological satellites  
∞ research projects  
satellite design  
space missions  
space transportation  
∞ spacecraft  
spacecraft design  
Tenma satellite

### Japanese spacecraft

DEF Spacecraft operated by the Japanese government. Used for MOS (Japanese spacecraft).

UF *MOS (Japanese spacecraft)*

GS **Japanese spacecraft**  
. EXOS satellites  
. . EXOS-A satellite  
. . EXOS-B satellite  
. . EXOS-C satellite  
. . EXOS-D satellite  
. Engineering Test Satellites  
. Ginga satellite  
. Nozomi Mars Orbiter  
. Tenma satellite

RT Japan  
Japanese space program  
∞ spacecraft

### jarring

USE **mechanical shock**

### JAS-39 aircraft

(added June 1995)

UF *Gripen aircraft*

GS attack aircraft  
. fighter aircraft  
. . **JAS-39 aircraft**

RT ∞ aircraft  
canard configurations  
Sweden

### JATO engines

UF *jet assisted takeoff*

GS engines  
. **JATO engines**  
launchers  
. aircraft launching devices  
. . **JATO engines**

RT short takeoff aircraft  
solid propellant rocket engines  
takeoff

### Java (programming language)

(added December 1998)

GS languages  
. programming languages  
. . high level languages  
. . . **Java (programming language)**

RT C++ (programming language)  
client server systems  
internets  
object-oriented programming  
World Wide Web

### Javelin aircraft

USE **GA-5 aircraft**

### Javelin rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . **Javelin rocket vehicle**

RT Argo rocket vehicles  
rocket propelled sleds  
solid propellant rocket engines

sounding rockets

### Jayhawk helicopter

USE **H-60 Helicopter**

### JC-130 aircraft

USE **C-130 aircraft**

### Jeans theory

RT gravitational instability  
∞ theories

### jeeps

USE **automobiles**

### jerboas

GS animals  
. vertebrates  
. . mammals  
. . . rodents  
. . . . mice  
. . . . . **jerboas**

### jet aircraft

UF *jet flight*

*turbojet aircraft*

GS **jet aircraft**  
. A-2 aircraft  
. A-3 aircraft  
. A-4 aircraft  
. A-5 aircraft  
. A-6 aircraft  
. Alpha jet aircraft  
. AVRO 707 aircraft  
. B-1 aircraft  
. B-2 aircraft  
. B-47 aircraft  
. B-52 aircraft  
. B-57 aircraft  
. B-58 aircraft  
. B-66 aircraft  
. B-70 aircraft  
. Boeing 747 aircraft  
. Boeing 777 aircraft  
. Boeing 2707 aircraft  
. Buccaneer aircraft  
. C-5 aircraft  
. C-8A augmentor wing aircraft  
. C-9 aircraft  
. C-135 aircraft  
. C-140 aircraft  
. Canberra aircraft  
. CL-41 aircraft  
. CL-823 aircraft  
. Comet 4 aircraft  
. CV-880 aircraft  
. D-558 aircraft  
. DC 9 aircraft  
. DC 10 aircraft  
. DH 112 aircraft  
. DH 115 aircraft  
. DH 125 aircraft  
. DHC 2 aircraft  
. European Airbus  
. . A-300 aircraft  
. . A-310 aircraft  
. . A-320 aircraft  
. . A-330 aircraft  
. . A-340 aircraft  
. . A-380 aircraft  
. F-2 aircraft  
. F-4 aircraft  
. F-8 aircraft  
. F-9 aircraft  
. F-14 aircraft  
. F-15 aircraft  
. F-16 aircraft  
. F-17 aircraft  
. F-18 aircraft  
. F-20 aircraft  
. F-22 aircraft  
. F-84 aircraft  
. F-86 aircraft  
. F-89 aircraft  
. F-94 aircraft  
. F-100 aircraft  
. F-101 aircraft  
. F-102 aircraft  
. F-104 aircraft  
. F-105 aircraft  
. F-106 aircraft  
. F-117A aircraft  
. FD 2 aircraft  
. G-91 aircraft  
. G-95/4 aircraft  
. GA-5 aircraft  
. H-17 helicopter  
. H-126 aircraft  
. HFB-320 aircraft  
. HP-115 aircraft  
. HS-801 aircraft  
. IL-76 aircraft  
. IL-86 aircraft  
. IL-96 aircraft  
. jet provost aircraft  
. Jetstream aircraft  
. Jindivik target aircraft  
. L-29 jet trainer  
. L-1011 aircraft  
. L-2000 aircraft  
. Lear jet aircraft  
. MD 11 aircraft  
. MD 80 aircraft  
. Mirage aircraft  
. . Mirage 3 aircraft  
. Mystere 50 aircraft  
. Nord 1500 aircraft  
. P-308 aircraft  
. PD-808 aircraft  
. S-3 aircraft  
. SC-1 aircraft  
. Scimitar aircraft  
. T-2 aircraft  
. T-33 aircraft  
. T-37 aircraft  
. T-38 aircraft  
. T-39 aircraft  
. TS-11 aircraft  
. TSR-2 aircraft  
. TU-104 aircraft  
. TU-124 aircraft  
. TU-154 aircraft  
. TU-204 aircraft  
. turbofan aircraft  
. . A-7 aircraft  
. . BAC 111 aircraft  
. . Boeing 707 aircraft  
. . Boeing 717 aircraft  
. . Boeing 720 aircraft  
. . Boeing 727 aircraft  
. . Boeing 733 aircraft  
. . Boeing 737 aircraft  
. . Boeing 757 aircraft  
. . Boeing 767 aircraft  
. . C-141 aircraft  
. . CL-600 challenger aircraft  
. . Concorde aircraft  
. . CV-990 aircraft  
. . DC 8 aircraft  
. . DH 121 aircraft  
. . DO-31 aircraft  
. . F-5 aircraft  
. . F-28 transport aircraft  
. . F-111 aircraft  
. . IL-62 aircraft  
. . Mystere 20 aircraft  
. . P-1127 aircraft  
. . P-1154 aircraft  
. . Saab 37 aircraft  
. . Saab 105 aircraft  
. . SE-210 aircraft  
. . TU-134 aircraft  
. . TU-144 aircraft  
. turboprop aircraft  
. . AN-22 aircraft  
. . AN-24 aircraft  
. . Argosy MK-1 aircraft  
. . ATR-72 aircraft  
. . Breguet 941 aircraft  
. . Breguet 1150 aircraft  
. . C-2 aircraft  
. . C-130 aircraft  
. . C-133 aircraft  
. . C-160 aircraft  
. . CL-44 aircraft  
. . CL-84 aircraft  
. . DHC 5 aircraft  
. . DO-328 aircraft  
. . E-2 aircraft

- . . Electra aircraft
- . . F-27 aircraft
- . . G-222 aircraft
- . . HS-748 aircraft
- . . MH-262 aircraft
- . . OV-1 aircraft
- . . OV-10 aircraft
- . . P-3 aircraft
- . . SC-5 aircraft
- . . Viscount aircraft
- . . YS-11 aircraft
- . U-2 aircraft
- . Valiant aircraft
- . Vampire MK 35 aircraft
- . VC-10 aircraft
- . Victor MK-1 aircraft
- . VJ-101 aircraft
- . Vulcan aircraft
- . X-3 aircraft
- . X-5 aircraft
- . X-13 aircraft
- . X-14 aircraft
- . X-21 aircraft
- . X-21A aircraft
- . X-31 aircraft
- . X-32 aircraft
- . X-35 aircraft
- . XC-142 aircraft
- . XV-4 aircraft
- . XV-5 aircraft
- . XV-9A aircraft
- . Yak 40 aircraft

RT  $\infty$  aircraft

- aircraft noise
- attack aircraft
- bomber aircraft
- cargo aircraft
- commercial aircraft
- fighter aircraft
- flying platforms
- general aviation aircraft
- hypersonic aircraft

$\infty$  jets

$\infty$  low wing aircraft

$\infty$  military aircraft

- passenger aircraft
- reconnaissance aircraft
- research aircraft
- short takeoff aircraft

$\infty$  subsonic aircraft

- supersonic aircraft
- tailless aircraft
- tandem wing aircraft
- training aircraft
- transport aircraft
- turbojet engines
- V/STOL aircraft

$\infty$  winged vehicles

- YF-12 aircraft

**jet aircraft noise**

UF *jet noise*

GS elastic waves

- . sound waves
- . . noise (sound)
- . . . aircraft noise
- . . . . **jet aircraft noise**

RT acoustic retrofitting

- aerodynamic noise

$\infty$  aircraft

- aircraft runup
- engine noise
- mufflers
- noise measurement
- noise reduction
- quiet engine program
- screech tones
- sonic booms

*jet airstreams*

USE **jet streams (meteorology)**

**jet amplifiers**

UF *fluid jet amplifiers*

GS amplifiers

- . fluid amplifiers
- . . **jet amplifiers**

RT Coanda effect

- fluid jets

$\infty$  jet nozzles

nozzle walls

*jet assisted takeoff*

USE **JATO engines**

*jet augmented wing flaps*

USE **jet flaps**  
**wing flaps**

**jet blast effects**

RT  $\infty$  blasts

- $\infty$  effects
- exhaust gases
- ground effect (aerodynamics)
- noise (sound)
- pressure effects
- temperature effects

**jet boundaries**

GS boundaries

- . fluid boundaries
- . . **jet boundaries**
- interfaces
- . fluid boundaries
- . . **jet boundaries**

RT free jets

- liquid surfaces
- wall jets

**jet condensers**

GS condensers (liquefiers)

- . **jet condensers**

RT  $\infty$  condensers

- liquefaction
- nucleation
- spray condensers
- working fluids

**jet control**

RT automatic control

- boundary layer control

$\infty$  control

- directional control
- satellite attitude control
- satellite control
- thrust control
- variable thrust

*jet damping*

USE **damping**  
**spin reduction**

*Jet Dragon aircraft*

USE **DH 125 aircraft**

*jet drive*

USE **jet propulsion**

**jet engine fuels**

UF *jet fuels*

GS fuels

- . chemical fuels
- . . hydrocarbon fuels
- . . . **jet engine fuels**
- . . . . JP-4 jet fuel
- . . . . JP-5 jet fuel
- . . . . JP-6 jet fuel
- . . . . JP-7 jet fuel
- . . . . JP-8 jet fuel
- . . liquid fuels
- . . . **jet engine fuels**
- . . . . JP-4 jet fuel
- . . . . JP-5 jet fuel
- . . . . JP-6 jet fuel
- . . . . JP-7 jet fuel
- . . . . JP-8 jet fuel

RT aircraft fuels

- antimisting fuels
- gasoline
- kerosene
- turbines

**jet engines**

SN (EXCLUDES HYDROJET ENGINES)

DEF Broadly, engines that eject jets or streams of gas or fluids, obtaining all or most of their thrust by reaction to the ejection. Specifically, aircraft engines that derive all or most of their thrust by reaction to their ejection of combustion products (or heated air) in a jet and that obtains oxygen from the atmosphere for the

combustion of their fuel (or outside air for heating, as in the case of the nuclear jet engine), distinguished in this sense from a rocket engine. Jet engines of this kind may have compressors, commonly turbine driven, to take in and compress air (turbojets), or they may be compressorless, taking in and compressing air by other means (pulsejets, ramjets).

GS engines

- . air breathing engines
- . . gas turbine engines
- . . . **jet engines**
- . . . . ramjet engines
- . . . . integral rocket ramjets
- . . . . low volume ramjet engines
- . . . . pulsejet engines
- . . . . supersonic combustion ramjet engines
- . . . . . turbooramjet engines
- . . . . . turbojet engines
- . . . . . Bristol-Siddeley Olympus 593 engine
- . . . . . Bristol-Siddeley Viper engine
- . . . . . ducted fan engines
- . . . . . J-33 engine
- . . . . . J-34 engine
- . . . . . J-47 engine
- . . . . . J-52 engine
- . . . . . J-57 engine
- . . . . . J-58 engine
- . . . . . J-65 engine
- . . . . . J-69-T-25 engine
- . . . . . J-71 engine
- . . . . . J-73 engine
- . . . . . J-75 engine
- . . . . . J-79 engine
- . . . . . J-85 engine
- . . . . . J-93 engine
- . . . . . RA-28 engine
- . . . . . turbofan engines
- . . . . . Bristol-Siddeley BS 53 engine
- . . . . . CF-700 engine
- . . . . . convertible fan-shaft engines
- . . . . . J-97 engine
- . . . . . TF-30 engine
- . . . . . TF-34 engine
- . . . . . TF-41 engine
- . . . . . turboprop engines
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine
- . . . . . turbooramjet engines
- . . . . . internal combustion engines
- . . . . . gas turbine engines
- . . . . . **jet engines**
- . . . . . ramjet engines
- . . . . . integral rocket ramjets
- . . . . . low volume ramjet engines
- . . . . . pulsejet engines
- . . . . . supersonic combustion ramjet engines
- . . . . . turbooramjet engines
- . . . . . turbojet engines
- . . . . . Bristol-Siddeley Olympus 593 engine
- . . . . . Bristol-Siddeley Viper engine
- . . . . . ducted fan engines
- . . . . . J-33 engine
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- . . . . . J-65 engine
- . . . . . J-69-T-25 engine
- . . . . . J-71 engine
- . . . . . J-73 engine
- . . . . . J-75 engine
- . . . . . J-79 engine
- . . . . . J-85 engine
- . . . . . J-93 engine
- . . . . . RA-28 engine

# jet exhaust

- ..... turbofan engines
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- ..... turbine engines
- ..... gas turbine engines
- ..... **jet engines**
- ..... ramjet engines
- ..... integral rocket ramjets
- ..... low volume ramjet engines
- ..... pulsejet engines
- ..... supersonic combustion ramjet engines
- ..... turboramjet engines
- ..... turbojet engines
- ..... Bristol-Siddeley Olympus 593 engine
- ..... Bristol-Siddeley Viper engine
- ..... ducted fan engines
- ..... J-33 engine
- ..... J-34 engine
- ..... J-47 engine
- ..... J-52 engine
- ..... J-57 engine
- ..... J-58 engine
- ..... J-65 engine
- ..... J-69-T-25 engine
- ..... J-71 engine
- ..... J-73 engine
- ..... J-75 engine
- ..... J-79 engine
- ..... J-85 engine
- ..... J-93 engine
- ..... RA-28 engine
- ..... turbofan engines
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- ..... turboprop engines
- ..... T-34 engine
- ..... T-38 engine
- ..... T-53 engine
- ..... T-55 engine
- ..... T-56 engine
- ..... T-63 engine
- ..... T-64 engine
- ..... T-74 engine
- ..... T-76 engine
- ..... T-78 engine
- ..... turboramjet engines
- RT afterburning
- aircraft engines
- combustion chambers
- ejectors
- engine starters
- exhaust nozzles
- flameout
- flying ejection seats
- fuel injection
- fuel pumps
- helicopter engines
- hybrid propellant rocket engines
- hybrid propulsion
- infrared suppression
- ∞ jet nozzles
- quiet engine program
- reaction products
- rocket engines

thrust

## jet exhaust

UF *hot jet exhaust*  
 RT base heating  
 exhaust emission  
 exhaust gases  
 infrared suppression  
 rocket exhaust

## jet flames

USE **flames**  
**jet flow**

## jet flaps

UF *jet augmented wing flaps*  
 GS airfoils  
 . flaps (control surfaces)  
 . . **jet flaps**  
 control surfaces  
 . flaps (control surfaces)  
 . . **jet flaps**  
 RT externally blown flaps  
 H-126 aircraft  
 short takeoff aircraft  
 split flaps  
 tangential blowing  
 trailing edge flaps  
 vortex flaps  
 wing flaps

## jet flight

USE **jet aircraft**

## jet flow

UF *hot jets*  
*jet flames*  
*laminar jets*  
*reaction jets*  
 GS fluid flow  
 . **jet flow**  
 . . air jets  
 . . jet mixing flow  
 . . peripheral jet flow  
 . . supersonic jet flow  
 RT fluid jets  
 free boundaries  
 free jets  
 gas streams  
 hydraulic jets  
 injectors  
 jet membrane process  
 ∞ jets  
 nozzle flow  
 particle laden jets  
 spanwise blowing  
 two dimensional jets  
 vapor jets  
 wall jets

## jet fuels

USE **jet engine fuels**

## jet impingement

GS impingement  
 . **jet impingement**  
 RT ablation  
 base heating

## jet lag

DEF Desynchronization of biological rhythms because of transmeridian flight.

GS biological effects  
 . **jet lag**  
 disorientation  
 . **jet lag**  
 psychological effects  
 . **jet lag**  
 RT desynchronization (biology)  
 disorders  
 flight stress (biology)  
 rhythm (biology)  
 supersonic flight

## jet lift

GS aerodynamic characteristics  
 . lift  
 . . **jet lift**  
 aerodynamic forces  
 . lift

. . **jet lift**  
 dynamic characteristics  
 . lift  
 . . **jet lift**  
 RT distribution (property)

## jet membrane process

DEF Method for separating or enriching isotopes of the same element by using a condensable vapor as the carrier fluid. A process gas containing the isotopes enters a chamber into which a heavy condensable gas (the jet) flows. The lighter of the two isotopes is enriched, relative to the heavier species, and is collected by a probe downstream for further enrichment or analysis.

GS enrichment  
 . isotopic enrichment  
 . . **jet membrane process**  
 RT gas dynamics  
 isotope separation  
 isotopes  
 jet flow  
 membranes  
 ∞ processes  
 uranium

## jet mixing flow

GS fluid flow  
 . jet flow  
 . . **jet mixing flow**  
 RT fluid jets  
 free boundaries  
 fuel injection  
 injectors  
 ∞ jets  
 mixing  
 mixing layers (fluids)  
 premixing  
 screech tones  
 two dimensional jets

## jet noise

USE **jet aircraft noise**

## ∞ jet nozzles

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
 RT carburetors  
 conical nozzles  
 exhaust diffusers  
 exhaust nozzles  
 fuel injection  
 injectors  
 jet amplifiers  
 jet engines  
 skirts

## jet pilots

USE **aircraft pilots**

## jet propulsion

UF *jet drive*  
 GS propulsion  
 . **jet propulsion**  
 RT aircraft engines  
 chemical propulsion  
 helicopter propeller drive  
 marine propulsion  
 rocket engines  
 SQUID project  
 turbines

## jet provost aircraft

UF *Hunting P-84 aircraft*  
*P-84 aircraft*  
 GS attack aircraft  
 . fighter aircraft  
 . . **jet provost aircraft**  
 BAC aircraft  
 . **jet provost aircraft**  
 jet aircraft  
 . **jet provost aircraft**  
 monoplanes  
 . **jet provost aircraft**  
 single engine aircraft  
 . **jet provost aircraft**  
 training aircraft  
 . **jet provost aircraft**

RT ∞ aircraft

**jet pumps**

- SN (EXCLUDES DEVICES USING A LIQUID OR GAS TO INDUCE MOVEMENT OF A GAS SUCH AS AIR EJECTORS)
- GS pumps
  - . **jet pumps**
- RT ejectors
  - fuel pumps
  - ∞ jets
  - ∞ pumping
    - turbine pumps
    - vacuum pumps

*Jet Star aircraft*

USE **C-140 aircraft**

**jet streams (meteorology)**

DEF Strong bands of wind or winds in the upper troposphere or in the stratosphere, moving in a general direction from west to east and often reaching velocities of hundreds of miles an hour. Used for jet airstreams.

- UF *jet airstreams*
- GS fluid flow
  - . gas flow
  - . . air flow
  - . . . air currents
  - . . . . **jet streams (meteorology)**
- mesoscale phenomena
  - . **jet streams (meteorology)**
  - wind (meteorology)
  - . winds aloft
  - . . **jet streams (meteorology)**
- RT air jets
  - atmospheric circulation
  - circumpolar westerlies
  - clear air turbulence
  - Coanda effect
  - fluid jets
  - free boundaries
  - turbulent jets
  - zonal flow (meteorology)

**jet thrust**

DEF The thrust of a fluid, especially as distinguished from the thrust of a propeller. Used for reaction jets.

- UF *reaction jets*
- GS thrust
  - . **jet thrust**
- RT cold gas
  - convertible fan-shaft engines
  - high thrust
  - low thrust
  - microthrust
  - rocket thrust
  - static thrust
  - thrust loads
  - variable thrust

**jet vanes**

DEF Vanes either fixed or movable, used in a jetstream, especially in the jetstream of a rocket, for purposes of stability or control under conditions where external aerodynamic controls are ineffective. Also called blast vane.

- GS control surfaces
  - . guide vanes
  - . . **jet vanes**
  - vanes
  - . guide vanes
  - . . **jet vanes**
- RT airfoils
  - thrust vector control
  - wall jets

*jetavators*

USE **guide vanes**

∞ **jets**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT air jets
  - fluid jets
  - free jets
  - gas jets
  - injectors
  - jet aircraft

- jet flow
- jet mixing flow
- jet pumps
- plasma jets
- sprayers
- turbulent jets
- two dimensional jets
- wall jets

**Jetstream aircraft**

- GS commercial aircraft
  - . **Jetstream aircraft**
  - Grumman aircraft
  - . **Jetstream aircraft**
  - jet aircraft
    - . **Jetstream aircraft**
    - passenger aircraft
    - . **Jetstream aircraft**
- RT ∞ aircraft

*jetties*

USE **breakwaters**

**jettison systems**

- RT bailout
  - ejection
  - ejection seats
  - escape (abandonment)
  - escape systems
  - jettisoning
  - ∞ systems
  - wing tanks

**jettisoning**

- RT bailout
  - disposal
  - dumping
  - ejection
  - emptying
  - escape (abandonment)
  - expulsion
  - jettison systems
  - spilling

*JF 101 aircraft*

USE **F-101 aircraft**

**JFET**

DEF Junction field effect transistors in which semiconductor channels of low conductivity join the source and drain and in which these channels are reduced and cut off by the junction depletion regions, which reduce the conductivity and cause a voltage to be applied between the gate electrodes. Used for junction field effect transistors.

- UF *junction field effect transistors*
- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . transistors
  - . . . . field effect transistors
  - . . . . . **JFET**
  - . . . . . junction transistors
  - . . . . . **JFET**
- RT barrier layers
- ∞ junctions

**jigs**

- GS positioning devices (machinery)
  - . **jigs**
- RT clamps
  - fixtures
  - holders
  - mechanical devices
  - tools

*Jikiken satellite*

USE **EXOS-B satellite**

**jimsphere balloons**

- GS expandable structures
  - . inflatable structures
  - . . balloons
  - . . . high altitude balloons
  - . . . . **jimsphere balloons**
  - . . . . meteorological balloons
  - . . . . . **jimsphere balloons**

RT wind (meteorology)

**Jindivik target aircraft**

- GS drone vehicles
  - . drone aircraft
  - . . target drone aircraft
  - . . . **Jindivik target aircraft**
  - jet aircraft
    - . **Jindivik target aircraft**
    - monoplanes
    - . **Jindivik target aircraft**
    - pilotless aircraft
    - . drone aircraft
    - . . target drone aircraft
    - . . . **Jindivik target aircraft**
    - targets
    - . **Jindivik target aircraft**
- RT ∞ aircraft
  - remotely piloted vehicles

*jitter*

USE **vibration**

*jobs*

USE **tasks**

**Jodrell Bank Observatory**

DEF A large radio telescope, located near Manchester, England.

- GS observatories
  - . **Jodrell Bank Observatory**
- RT astronomical observatories
  - ground stations
  - radio telescopes
  - tracking stations

**Johnston Island**

- GS landforms
  - . islands
  - . . Pacific islands
  - . . . **Johnston Island**

**joined wings**

- GS airfoils
  - . wings
  - . . **joined wings**
- RT aircraft configurations
  - dual wing configurations
  - research aircraft
  - tandem wing aircraft
  - wing tips

∞ **joining**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *interconnection linking*
- RT adhesion
  - adhesive bonding
  - assembling
  - beam leads
  - binding
  - bonding
  - brazing
  - cold working
  - couplings
  - crosslinking
  - fitting
  - fusion (melting)
  - inertia bonding
  - joints (junctions)
  - locking
  - mooring
  - mounting
  - positioning
  - retaining
  - riveting
  - sealing
  - sewing
  - soldering
  - splicing
  - ultrasonic soldering
  - welding
  - yokes

**Joint European Torus**

- GS nuclear reactors
  - . tokamak devices
  - . . **Joint European Torus**
  - plasma generators



## joints (anatomy)

. tokamak devices  
.. **Joint European Torus**  
RT controlled fusion  
reactor technology

### joints (anatomy)

GS anatomy  
. musculoskeletal system  
.. **joints (anatomy)**  
... elbow (anatomy)  
... knee (anatomy)  
... wrist  
RT arthritis  
bones  
connective tissue  
flexors  
ligaments  
shoulders

### joints (junctions)

UF *connections*  
*shanks*  
GS **joints (junctions)**  
. bolted joints  
. bonded joints  
. butt joints  
. interference fit  
. lap joints  
. metal joints  
.. soldered joints  
.. welded joints  
... spot welds  
. riveted joints  
. scarf joints  
. seams (joints)  
RT adapters  
adhesives  
balls  
barrier layers  
bellows  
bonding  
clamped structures  
closures  
connectors  
corners  
couplings  
fasteners  
fillets  
fittings  
∞ joining  
∞ junctions  
linkages  
metal bonding  
sleeves  
structural members  
swivels  
unions (connectors)

### Jordan

GS nations  
. **Jordan**

### Jordan form

GS algebra  
. vector spaces  
.. matrices (mathematics)  
... **Jordan form**  
RT eigenvalues  
linear transformations  
tensors

### Josephson effect

(added April 1999)  
UF *Josephson tunneling*  
RT electron tunneling  
Josephson junctions  
SIS (superconductors)  
superconducting devices  
superconductors (materials)

### Josephson junctions

RT high temperature superconductors  
Josephson effect  
SIS (superconductors)  
squid (detectors)  
superconductivity

tunnel junctions

*Josephson tunneling*  
(added April 1999)  
USE **Josephson effect**

### Joukowski transformation

RT airfoil profiles  
complex variables  
coordinate transformations  
Kutta-Joukowski condition  
Theodorsen transformation

### Joule heating

USE **ohmic dissipation**  
**resistance heating**

### Joule-Thomson effect

DEF A change of temperature in a gas  
undergoing Joule-Thomson expansion.

RT cryogenics  
∞ effects  
enthalpy  
gas expansion  
gas flow  
kinetic theory  
ohmic dissipation  
thermodynamic properties  
thermodynamics  
throttling

### journal bearings

DEF Bearings that support the cylindrical  
journal of a shaft in rotating machinery.

GS bearings  
. **journal bearings**  
RT antifriction bearings  
foil bearings

### ∞ journals

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT news media  
periodicals  
shafts (machine elements)

### *journals (documents)*

USE **periodicals**

### *journals (shafts)*

USE **shafts (machine elements)**

### JP-4 jet fuel

GS fuels  
. chemical fuels  
.. hydrocarbon fuels  
... jet engine fuels  
... **JP-4 jet fuel**  
.. liquid fuels  
... jet engine fuels  
... **JP-4 jet fuel**  
RT JP-6 jet fuel  
JP-8 jet fuel  
RP-1 rocket propellants

### JP-5 jet fuel

GS fuels  
. chemical fuels  
.. hydrocarbon fuels  
... jet engine fuels  
... **JP-5 jet fuel**  
.. liquid fuels  
... jet engine fuels  
... **JP-5 jet fuel**

### JP-6 jet fuel

GS fuels  
. chemical fuels  
.. hydrocarbon fuels  
... jet engine fuels  
... **JP-6 jet fuel**  
.. liquid fuels  
... jet engine fuels  
... **JP-6 jet fuel**  
RT JP-4 jet fuel  
JP-8 jet fuel

### JP-7 jet fuel

(added September 1995)  
GS fuels

. chemical fuels  
.. hydrocarbon fuels  
... jet engine fuels  
... **JP-7 jet fuel**  
.. liquid fuels  
... jet engine fuels  
... **JP-7 jet fuel**  
RT JP-8 jet fuel  
kerosene

### JP-8 jet fuel

GS fuels  
. chemical fuels  
.. hydrocarbon fuels  
... jet engine fuels  
... **JP-8 jet fuel**  
.. liquid fuels  
... jet engine fuels  
... **JP-8 jet fuel**  
RT JP-4 jet fuel  
JP-6 jet fuel  
JP-7 jet fuel  
kerosene

### judgments

RT decision making  
decisions  
legal liability  
penalties

### Judi-Dart rocket

GS measuring instruments  
. sondes  
.. **Judi-Dart rocket**  
rocket vehicles  
. sounding rockets  
.. **Judi-Dart rocket**  
RT rocket sounding

### juices

GS liquids  
. **juices**  
RT createine

### jumpers

DEF Short lengths of conductors used to  
complete electrical circuits, usually temporary,  
between terminals, or bypassing an existing  
circuit.

GS conductors  
. electrolytes  
.. **jumpers**  
RT connectors  
short circuits  
∞ terminals  
wire

### junction diodes

GS electronic equipment  
. diodes  
.. semiconductor diodes  
... **junction diodes**  
... MIM diodes  
... step recovery diodes  
. solid state devices  
.. semiconductor devices  
... **junction diodes**  
... MIM diodes  
... step recovery diodes  
RT barrier layers  
Barritt diodes  
germanium diodes  
heterojunction devices  
heterojunctions  
tunnel diodes  
varactor diodes

### *junction field effect transistors*

USE **JFET**

### junction transistors

GS electronic equipment  
. solid state devices  
.. semiconductor devices  
... transistors  
... **junction transistors**  
... JFET  
RT barrier layers  
epitaxy  
ion implantation

∞ junctions  
 MBM junctions  
 phototransistors  
 thyristors

∞ **junctions**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF In semiconductor devices, regions of transition between semiconducting regions of different electrical properties.  
 RT connectors  
 intersections  
 JFET  
 joints (junctions)  
 junction transistors  
 p-i-n junctions  
 p-n junctions  
 p-n-p junctions  
 p-n-p-n junctions  
 semiconductor devices  
 semiconductor junctions

*jungles*  
 USE **tropical regions**

**Juno 1 launch vehicle**  
 GS launch vehicles  
 . Juno launch vehicles  
 . . **Juno 1 launch vehicle**  
 rocket vehicles  
 . multistage rocket vehicles  
 . . Juno launch vehicles  
 . . . **Juno 1 launch vehicle**  
 RT Explorer satellites  
 Jupiter C rocket vehicle  
 liquid propellant rocket engines  
 sergeant missiles  
 solid propellant rocket engines

**Juno 2 launch vehicle**  
 GS launch vehicles  
 . Juno launch vehicles  
 . . **Juno 2 launch vehicle**  
 rocket vehicles  
 . multistage rocket vehicles  
 . . Juno launch vehicles  
 . . . **Juno 2 launch vehicle**  
 RT Explorer 11 satellite  
 Jupiter missile  
 liquid propellant rocket engines  
 Pioneer 3 space probe  
 Pioneer 4 space probe  
 Pioneer 6 space probe  
 Pioneer 7 space probe  
 Pioneer 8 space probe  
 Pioneer space probes  
 sergeant missiles  
 solid propellant rocket engines

**Juno launch vehicles**  
 GS launch vehicles  
 . **Juno launch vehicles**  
 . . Juno 1 launch vehicle  
 . . Juno 2 launch vehicle  
 rocket vehicles  
 . multistage rocket vehicles  
 . . **Juno launch vehicles**  
 . . . Juno 1 launch vehicle  
 . . . Juno 2 launch vehicle  
 RT liquid propellant rocket engines  
 solid propellant rocket engines  
 ∞ vehicles

**Juno mission**  
*(added June 2010)*  
 DEF A NASA New Frontiers Program mission that will use a polar orbiting spacecraft to study the formation, evolution, and structure of the planet Jupiter. Juno will investigate the existence of a solid planetary core, map Jupiter's intense magnetic field, measure the amount of water and ammonia in the deep atmosphere, and observe the planet's auroras.  
 GS space missions

. **Juno mission**  
 RT auroras  
 Jupiter (planet)  
 planetary atmospheres  
 planetary composition  
 planetary cores  
 planetary evolution  
 planetary magnetic fields  
 planetary structure

**Jupiter (planet)**  
 GS celestial bodies  
 . planets  
 . . gas giant planets  
 . . . **Jupiter (planet)**  
 RT Adrastea  
 Amalthea  
 Amor asteroid  
 Apollo asteroids  
 Callisto  
 Carme  
 Elara  
 Europa  
 Galilean satellites  
 Galileo probe  
 Galileo spacecraft  
 Ganymede  
 Himalia  
 Io  
 Juno mission  
 Jupiter atmosphere  
 Jupiter probes  
 Jupiter red spot  
 Jupiter rings  
 Jupiter satellites  
 Leda  
 Lysithea  
 Metis  
 Pasiphae  
 Shoemaker-Levy 9 comet  
 Sinope  
 Thebe  
 Trojan asteroids  
 Voyager 1 spacecraft  
 Voyager 2 spacecraft  
 Voyager 1977 mission

**Jupiter atmosphere**  
 GS environments  
 . extraterrestrial environments  
 . . planetary environments  
 . . . planetary atmospheres  
 . . . . **Jupiter atmosphere**  
 RT aerospace environments  
 Galileo project  
 geophysical fluid flow cells  
 Jupiter (planet)  
 Jupiter rings  
 planetary ionospheres  
 planetary meteorology

**Jupiter C rocket vehicle**  
 GS rocket vehicles  
 . multistage rocket vehicles  
 . . **Jupiter C rocket vehicle**  
 RT Explorer satellites  
 Juno 1 launch vehicle  
 Jupiter missile  
 launch vehicles  
 liquid propellant rocket engines  
 sergeant missiles  
 solid propellant rocket engines

**Jupiter missile**  
 GS missiles  
 . ballistic missiles  
 . . intermediate range ballistic missiles  
 . . . **Jupiter missile**  
 . surface to surface missiles  
 . . intermediate range ballistic missiles  
 . . . **Jupiter missile**  
 RT Juno 2 launch vehicle  
 Jupiter C rocket vehicle

liquid propellant rocket engines

**Jupiter probes**  
 GS interplanetary spacecraft  
 . **Jupiter probes**  
 . . Galileo probe  
 . . Galileo spacecraft  
 unmanned spacecraft  
 . space probes  
 . . **Jupiter probes**  
 . . . Galileo probe  
 . . . Galileo spacecraft  
 RT Galileo project  
 Jupiter (planet)  
 Voyager 1 spacecraft  
 Voyager 2 spacecraft  
 Voyager 1977 mission

**Jupiter project**  
 GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Jupiter project**  
 . projects  
 . . **Jupiter project**  
 . space programs  
 . . NASA space programs  
 . . . **Jupiter project**  
 RT launch vehicles

**Jupiter red spot**  
 RT gas giant planets  
 Jupiter (planet)  
 planetary surfaces  
 planets  
 surface properties  
 topography

**Jupiter rings**  
 DEF Ring structures around the planet Jupiter discovered on March 4, 1979 by Voyager 1.  
 GS celestial bodies  
 . planetary rings  
 . . **Jupiter rings**  
 RT Jupiter (planet)  
 Jupiter atmosphere  
 Jupiter satellites  
 moonlets  
 planetary composition  
 planetary structure  
 planetology  
 ∞ rings  
 Saturn rings  
 space exploration  
 Uranus rings  
 Voyager 1 spacecraft

**Jupiter satellites**  
 DEF Any or all of the natural satellites surrounding the planet Jupiter.  
 GS celestial bodies  
 . natural satellites  
 . . **Jupiter satellites**  
 . . . Adrastea  
 . . . Amalthea  
 . . . Carme  
 . . . Elara  
 . . . Galilean satellites  
 . . . . Callisto  
 . . . . Europa  
 . . . . Ganymede  
 . . . . Io  
 . . . Himalia  
 . . . Leda  
 . . . Lysithea  
 . . . Metis  
 . . . Pasiphae  
 . . . Sinope  
 . . . Thebe  
 RT icy satellites  
 Jupiter (planet)  
 Jupiter rings  
 solar system

*JWST (observatory)*  
*(added October 2003)*  
 USE **James Webb Space Telescope**

# K

*K band*  
USE **extremely high frequencies**

## K lines

GS spectra  
 . radiation spectra  
 . . electromagnetic spectra  
 . . . line spectra  
 . . . . **K lines**  
 RT absorption spectra  
 emission spectra  
 H lines

## K stars

GS celestial bodies  
 . stars  
 . . late stars  
 . . . cool stars  
 . . . . **K stars**  
 RT dwarf stars  
 giant stars  
 main sequence stars  
 stellar spectra  
 supergiant stars

## KA band

USE **extremely high frequencies**

## Kakutani theorem

GS theorems  
 . **Kakutani theorem**  
 RT lattices (mathematics)  
 stochastic processes  
 vector spaces

## Kalahari Basin (Africa)

GS landforms  
 . structural basins  
 . . **Kalahari Basin (Africa)**  
 RT Africa  
 deserts  
 Republic of South Africa

## Kalman filters

GS linear filters  
 . **Kalman filters**  
 RT electric filters  
 ∞ filters  
 linear quadratic Gaussian control  
 linear quadratic regulator  
 navigation aids  
 optimization  
 reduced order filters  
 state estimation

## Kalman-Schmidt filtering

RT ∞ applications of mathematics  
 feedback control  
 inertial platforms  
 navigation instruments  
 optimal control  
 optimization  
 remote control  
 stochastic processes  
 time series analysis

## kamacite

GS alloys  
 . nickel alloys  
 . . **kamacite**  
 minerals  
 . **kamacite**  
 RT iron alloys  
 iron meteorites  
 meteoritic composition

## Kaman aircraft

GS **Kaman aircraft**  
 . H-43 helicopter  
 . HH-43 helicopter  
 . UH-2 helicopter

RT ∞ aircraft

*Kaman UH-2A helicopter*  
USE **UH-2 helicopter**

## Kampuchea

USE **Cambodia**

## Kansas

GS nations  
 . United States  
 . . **Kansas**  
 RT Missouri River (US)

## kaolinite

DEF A hydrous silicate of aluminum. It constitutes the principle mineral in kaolin.  
 GS aluminum compounds  
 . aluminum silicates  
 . . **kaolinite**  
 clays  
 . **kaolinite**  
 minerals  
 . **kaolinite**  
 silicon compounds  
 . silicates  
 . . aluminum silicates  
 . . . **kaolinite**  
 RT aluminum oxides  
 ion exchanging  
 soils

## kaon production

GS particle production  
 . **kaon production**  
 RT kaons  
 particle accelerators

## kaons

UF *k-mesons*  
 GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . **kaons**  
 . . hadrons  
 . . . mesons  
 . . . . **kaons**  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . **kaons**  
 RT baryons  
 charged particles  
 kaon production  
 pions  
 Pomeranchuk theorem

## Kapitza resistance

RT ∞ resistance

## Kapoeta achondrite

GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . achondrites  
 . . . . **Kapoeta achondrite**

## Kappa 8 rocket vehicle

GS rocket vehicles  
 . multistage rocket vehicles  
 . . Kappa rocket vehicles  
 . . . **Kappa 8 rocket vehicle**  
 . . sounding rockets  
 . . Kappa rocket vehicles  
 . . . **Kappa 8 rocket vehicle**  
 RT solid propellant rocket engines

## Kappa 9 rocket vehicle

GS rocket vehicles  
 . multistage rocket vehicles  
 . . Kappa rocket vehicles  
 . . . **Kappa 9 rocket vehicle**  
 . . sounding rockets  
 . . Kappa rocket vehicles  
 . . . **Kappa 9 rocket vehicle**

RT solid propellant rocket engines

## Kappa rocket vehicles

GS rocket vehicles  
 . multistage rocket vehicles  
 . . **Kappa rocket vehicles**  
 . . . Kappa 8 rocket vehicle  
 . . . Kappa 9 rocket vehicle  
 . sounding rockets  
 . . **Kappa rocket vehicles**  
 . . . Kappa 8 rocket vehicle  
 . . . Kappa 9 rocket vehicle  
 RT solid propellant rocket engines  
 ∞ vehicles

## kappa-epsilon turbulence model

USE **k-epsilon turbulence model**

## kappa-omega turbulence model

(added June 1997)  
USE **k-omega turbulence model**

## Kapton (trademark)

GS nitrogen compounds  
 . amides  
 . . polyimides  
 . . . **Kapton (trademark)**  
 polymeric films  
 . **Kapton (trademark)**  
 RT ∞ films  
 plastics  
 ∞ polymers

## Karhunen-Loeve expansion

GS data processing  
 . **Karhunen-Loeve expansion**  
 expansion  
 . **Karhunen-Loeve expansion**  
 RT principal components analysis

## Karl Fischer reagent

GS chemical tests  
 . chemical analysis  
 . . **Karl Fischer reagent**  
 RT dioxides  
 methyl alcohol  
 pyridines  
 quantitative analysis

## Karman vortex street

DEF A double trail of vortices formed alternately on both sides of a cylinder of similar body moving at right angles to its axis through a fluid, the vortices in one row rotating in a direction opposite to that of the other row. (After Theodore von Karman, 1881-1963, Hungarian born American scientist).

GS vortex streets  
 . **Karman vortex street**  
 RT aeolian tones  
 subsonic flow  
 Von Karman equation  
 vorticity equations

## Karman-Bodewadt flow

GS fluid flow  
 . axisymmetric flow  
 . . **Karman-Bodewadt flow**  
 . parallel flow  
 . . three dimensional flow  
 . . . **Karman-Bodewadt flow**  
 . viscous flow  
 . . **Karman-Bodewadt flow**  
 translational motion  
 . three dimensional motion  
 . . three dimensional flow  
 . . . **Karman-Bodewadt flow**  
 RT rotating disks  
 rotating fluids

## karst

GS landforms  
 . structural basins  
 . . **karst**  
 . . sinkholes  
 RT caves  
 cavities  
 kettles (geology)  
 ∞ ridges

- rocks
  - . . . space mechanics
  - . . . . orbital mechanics
  - . . . . . **Kepler laws**
- Kawasaki aircraft**
  - RT  $\infty$  aircraft
- Kazakhstan**
  - (added August 1993)
  - GS nations
    - . **Kazakhstan**
  - RT Asia
- KC-130 aircraft**
  - USE **C-130 aircraft**
- KC-135 aircraft**
  - USE **C-135 aircraft**
- keels**
  - GS hydrofoils
    - . **keels**
  - RT boats
    - hulls (structures)
    - longerons
    - ships
    - stabilizers (fluid dynamics)
- KEL-F**
  - GS halogen compounds
    - . fluorine compounds
    - . . . fluoro compounds
    - . . . . fluorine organic compounds
    - . . . . . fluoropolymers
    - . . . . . **KEL-F**
    - organic compounds
    - . fluorine organic compounds
    - . . fluoropolymers
    - . . . **KEL-F**
  - RT copolymers
  - $\infty$  polymers
- kelp*
  - USE **seaweeds**
- Kelvin waves**
  - (added July 1994)
  - RT atmospheric circulation
    - Coriolis effect
    - gravity waves
    - ocean currents
    - planetary waves
  - $\infty$  waves
- Kelvin-Helmholtz instability**
  - RT collisionless plasmas
    - flow stability
  - $\infty$  Helmholtz equations
    - magnetohydrodynamic flow
    - magnetohydrodynamic stability
    - mass flow
    - nonuniform plasmas
    - plasmas (physics)
    - superfluidity
- Kentucky**
  - GS nations
    - . United States
    - . . **Kentucky**
  - RT Ohio River (US)
    - Tennessee Valley (AL-KY-TN)
- Kenya**
  - GS nations
    - . **Kenya**
  - RT Africa
- Kepler laws**
  - DEF The three empirical laws governing the motions of the planets in their orbits, discovered by Johannes Kepler (1571-1630). These are: (a) the orbits of the planets are ellipses, with the sun at a common focus; (b) as a planet moves in its orbit, the line joining the planet and the sun sweeps over equal areas in equal intervals of time (also called law of equal areas); (c) the squares of the periods of revolution of any two planets are proportional to the cubes of their mean distances from the sun.
  - GS laws
    - . **Kepler laws**
    - mechanics (physics)
    - . classical mechanics
- Kepler mission**
  - (added April 2009)
  - DEF A space mission designed to explore the structure and diversity of planetary systems, with a special emphasis on the detection of Earth-size planets in or near the habitable zone.
  - GS artificial satellites
    - . scientific satellites
    - . . astronomical satellites
    - . . . **Kepler mission**
    - observatories
      - . astronomical observatories
    - . . astronomical satellites
    - . . . **Kepler mission**
    - space missions
      - . **Kepler mission**
  - RT astronomical photometry
    - extrasolar planets
    - NASA space programs
    - planet detection
    - planetary systems
- k-epsilon turbulence model**
  - (added September 1988)
  - UF *kappa-epsilon turbulence model*
  - GS models
    - . mathematical models
    - . . turbulence models
    - . . . **k-epsilon turbulence model**
  - RT closure law
    - computational fluid dynamics
    - flow equations
    - k-omega turbulence model
    - turbulent boundary layer
    - turbulent flow
- keratins**
  - GS biopolymers
    - . proteins
    - . . **keratins**
    - organic compounds
    - . proteins
    - . . **keratins**
  - RT hair
    - wool
- keratitis**
  - GS diseases
    - . eye diseases
    - . . **keratitis**
    - . infectious diseases
    - . . bacterial diseases
    - . . . **keratitis**
  - RT conjunctiva
    - cornea
- kernel functions**
  - GS analysis (mathematics)
    - . real variables
    - . . **kernel functions**
    - functions (mathematics)
      - . **kernel functions**
  - RT Mellin transforms
    - meshfree methods
- kerogen**
  - DEF Fossilized insoluble organic material found in sedimentary rocks, usually shales, which can be converted to petroleum products by distillation.
  - GS organic compounds
    - . **kerogen**
    - resources
      - . Earth resources
      - . . **kerogen**
  - RT fuel oils
    - fuels
      - gasoline
      - greases
      - hydrocarbon fuels
      - kerosene
      - lubricants
      - oils
      - petroleum products
- shale oil
- kerosene**
  - GS fuels
    - . chemical fuels
    - . . liquid fuels
    - . . . **kerosene**
  - RT antimisting fuels
    - diesel fuels
    - fuel oils
    - gasoline
    - hydrocarbon fuels
    - jet engine fuels
    - JP-7 jet fuel
    - JP-8 jet fuel
    - kerogen
    - paraffins
    - RP-1 rocket propellants
    - shale oil
- Kerr cells**
  - RT camera shutters
  - $\infty$  cells
    - $\infty$  electric cells
    - polarized electromagnetic radiation
    - polarizers
- $\infty$  **Kerr effects**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT  $\infty$  effects
    - electro-optical effect
    - Kerr electrooptical effect
    - Kerr magnetooptical effect
    - magnetic fields
- Kerr electrooptical effect**
  - GS electromagnetic properties
    - . optical properties
    - . . birefringence
    - . . . **Kerr electrooptical effect**
    - refraction
      - . birefringence
      - . . **Kerr electrooptical effect**
  - RT  $\infty$  effects
    - electromagnetic radiation
    - electro-optics
    - $\infty$  Kerr effects
    - Kerr magnetooptical effect
    - lasers
    - light modulation
    - polarization (waves)
- Kerr magnetooptical effect**
  - GS electromagnetic properties
    - . **Kerr magnetooptical effect**
  - RT  $\infty$  effects
    - Faraday effect
    - $\infty$  Kerr effects
    - Kerr electrooptical effect
    - magneto-optics
    - optical properties
    - polarization (waves)
    - polarized light
- Kestrel aircraft*
  - USE **P-1127 aircraft**
- ketenes**
  - RT ketones
- ketones**
  - DEF A class of organic compounds possessing a carbonyl group attached to two hydrocarbon groups.
  - GS **ketones**
    - . acetone
    - . acetylacetone
    - . anthraquinones
    - . camphor
    - . Nembutal (trademark)
    - . pentanone
    - . trimethadione
  - RT ketenes
    - PEEK
    - quinones
- kettles (geology)**
  - DEF Steepsided, usually basin or bowlshaped holes or depressions, commonly

## Kevlar (trademark)

without surface drainage, in glacial drift deposits (especially outwash and kame fields). Kettles often contain lakes or swamps; formed by the melting of large detached blocks of stagnant ice (left behind by retreating glaciers) that had been wholly or partly buried by glacial drift. Kettles range in depth from about a meter to as much as 13 km. Thoreau's Walden Pond is an example.

GS geology  
. **kettles (geology)**  
landforms  
. structural basins  
. . **kettles (geology)**

RT caves  
cavities  
Earth resources  
glacial drift  
karst  
lakes  
sinkholes

## Kevlar (trademark)

DEF A Dupont synthetic textile material, lightweight and nonflammable, and with high impact resistance.

GS fibers  
. reinforcing fibers  
. . aramid fibers  
. . . **Kevlar (trademark)**  
. synthetic fibers  
. . aramid fibers  
. . . **Kevlar (trademark)**  
plastics  
. synthetic resins  
. . thermosetting resins  
. . . furan resins  
. . . . polyamide resins  
. . . . . **Kevlar (trademark)**  
resins  
. synthetic resins  
. . thermosetting resins  
. . . furan resins  
. . . . polyamide resins  
. . . . . **Kevlar (trademark)**

RT aramid fiber composites  
nonflammable materials  
synthetic fibers

## keying

GS **keying**  
. frequency shift keying  
. phase shift keying  
. . binary phase shift keying  
. . quadrature phase shift keying

RT Morse code  
radio telegraphy  
teleprinters  
teletypewriters

## keys (islands)

UF cays

GS landforms  
. islands  
. . **keys (islands)**

RT coral reefs  
Earth resources  
island arcs  
oceans

## Kibo Japanese Experiment Module

(added May 2008)

DEF A permanent science module for the International Space Station developed by the Japanese Aerospace Exploration Agency. As Japan's primary contribution to the ISS, Kibo consists of six components, two of which are research facilities used for spaceborne experiments.

GS laboratories  
. space laboratories  
. . manned orbital laboratories  
. . . **Kibo Japanese Experiment Module**  
manned spacecraft  
. manned orbital laboratories  
. . **Kibo Japanese Experiment Module**  
modules  
. space station modules

## . . Kibo Japanese Experiment Module

RT International Space Station  
Japanese space program  
spaceborne experiments  
spacecraft modules

*kidney calculi*  
(added August 2004)  
USE **kidney stones**

## kidney diseases

GS diseases  
. **kidney diseases**  
. . kidney stones  
. . nephritis

RT cholera

## kidney stones

(added August 2004)  
DEF Calculi occurring in the kidney. Calculi too large to pass spontaneously range in size from 1 cm to the staghorn stones that occupy the renal pelvis and calyces.

UF *kidney calculi*  
*renal calculi*

GS diseases  
. kidney diseases  
. . **kidney stones**  
signs and symptoms  
. **kidney stones**

RT calcium phosphates  
genitourinary system  
kidneys  
renal function

## kidneys

GS anatomy  
. genitourinary system  
. . **kidneys**  
. . . glomerulus

RT kidney stones  
renal function  
renin  
urine  
urolithiasis  
urology

## kilometer wave orbiting telescope

GS radio equipment  
. radio telescopes  
. . **kilometer wave orbiting telescope**  
telescopes  
. radio telescopes  
. . **kilometer wave orbiting telescope**

## kilometric waves

DEF Electromagnetic waves with wavelengths between 1,000 and 10,000 meters.

GS electromagnetic radiation  
. **kilometric waves**  
RT  $\infty$  waves

## kimberlite

USE **biotite**  
**peridotite**

## kinematic equations

GS equations of motion  
. kinetic equations  
. . **kinematic equations**

RT  $\infty$  equations

## kinematics

DEF The branch of mechanics dealing with the description of the motion of bodies or fluids without reference to the forces producing the motion.

GS **kinematics**  
. body kinematics  
. inverse kinematics

RT acceleration (physics)  
 $\infty$  dynamics  
equations of motion  
hodographs  
kinetics  
mechanics (physics)  
microwave reflectometers

$\infty$  motion  
nutation  
velocity

## kinescopes

USE **picture tubes**

## kinesthesia

GS perception  
. sensory perception  
. . **kinesthesia**

RT proprioception

## kinesthesia

USE **proprioception**

## kinetic energy

DEF The energy which a body possesses as a consequence of its motion. Used for momentum energy.

UF *momentum energy*

GS kinetics  
. **kinetic energy**  
chemical energy  
electron energy

$\infty$  energy  
equipartition theorem  
Froude number  
hydrodynamic ram effect  
internal energy  
Lagrange similarity hypothesis  
Lagrangian function  
particle energy  
potential energy  
proton energy  
thermal energy  
virial theorem  
work  
zero point energy

## kinetic equations

GS equations of motion  
. **kinetic equations**  
. . hydrodynamic equations  
. . . Burnett equations  
. . . Helmholtz vorticity equation  
. . kinematic equations

RT BBGKY hierarchy  
Bethe-Salpeter equation  
BGK model  
Einstein equations

$\infty$  equations  
partial differential equations  
virial theorem

## kinetic friction

GS friction  
. **kinetic friction**  
. . sliding friction

RT coefficient of friction  
dry friction  
friction measurement  
static friction

## kinetic heating

GS heating  
. **kinetic heating**  
. . aerodynamic heating  
. . . shock heating

RT gas heating  
magnetic pumping  
plasma heating

## kinetic theory

DEF The derivation of the bulk properties of fluids from the properties of their constituent molecules, their motions and interactions.

GS **kinetic theory**  
. transport theory  
. . Chapman-Enskog theory  
. . Eyring theory  
. . mixing length flow theory

RT BGK model  
binary fluids  
Boltzmann distribution  
Boltzmann transport equation  
diffusion  
diffusion theory  
diffusion waves  
dynamic pressure

- equations of state  
 free molecular flow  
 gas transport  
 gaseous self-diffusion  
 ideal gas  
 Joule-Thomson effect  
 Knudsen flow  
 Krook equation  
 Lorentz gas  
 mass flow  
 Maxwell-Boltzmann density function  
 mobility  
 momentum transfer  
 Morse potential  
 real gases  
 ∞ theories  
 transport properties
- kinetics**  
 GS **kinetics**  
 . electrokinetics  
 . kinetic energy  
 . Newton second law  
 . Newton Theory  
 . reaction kinetics  
 . variable mass systems  
 RT acceleration (physics)  
 angular momentum  
 body kinematics  
 ∞ dynamics  
 fluid dynamics  
 fluid mechanics  
 ∞ force  
 gas dynamics  
 hydromechanics  
 ideal gas  
 kinematics  
 mechanics (physics)  
 momentum transfer  
 motion aftereffects  
 newton  
 particle collisions  
 ∞ physics  
 velocity
- kink bands**  
 (added March 1998)  
 RT buckling  
 compression loads  
 edge dislocations  
 failure modes  
 fiber composites  
 microstructure  
 plastic deformation  
 reinforcing fibers  
 single crystals
- kinking**  
 (added April 1998)  
 RT bending  
 buckling  
 compression loads  
 cracking (fracturing)  
 deformation  
 displacement  
 failure modes  
 fiber composites  
 folding  
 heaving  
 twisting  
 wrinkling
- kinofom**  
 GS display devices  
 . **kinofom**  
 imagery  
 . **kinofom**  
 RT computer programming  
 holography  
 wave front reconstruction
- ∞ **Kirchhoff law**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT Kirchhoff law of networks  
 Kirchhoff law of radiation
- Kirchhoff law of networks**  
 RT circuits  
 electric current
- electric potential  
 ∞ Kirchhoff law  
 ∞ nets  
 network analysis  
 network synthesis
- Kirchhoff law of radiation**  
 DEF The radiation law which states that at a given temperature the ratio of the emissivity to the absorptivity for a given wavelength is the same for all bodies and is equal to the emissivity of an ideal black body at that temperature and wavelength.  
 GS laws  
 . radiation laws  
 . . **Kirchhoff law of radiation**  
 RT absorptivity  
 black body radiation  
 ∞ Kirchhoff law  
 ∞ radiation  
 Stefan-Boltzmann law  
 thermodynamics
- Kirchhoff-Helmholtz flow*  
 USE **pipe flow**
- Kirchhoff-Huygens principle*  
 USE **diffraction**  
**wave propagation**
- Kirkendall effect**  
 RT diffusion theory  
 diffusion welding  
 diffusivity  
 ∞ effects  
 thermal diffusion
- kite balloons*  
 USE **tethered balloons**
- kits**  
 RT first aid  
 survival  
 tools
- KIWI B reactors**  
 GS nuclear electric power generation  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B reactors**  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 nuclear reactors  
 . gas cooled reactors  
 . . KIWI reactors  
 . . . **KIWI B reactors**  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B reactors**  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . nuclear research and test reactors  
 . . KIWI reactors  
 . . . **KIWI B reactors**  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor
- KIWI B-1 Reactor**  
 GS nuclear electric power generation  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B-1 Reactor**  
 nuclear reactors  
 . gas cooled reactors  
 . . KIWI reactors  
 . . . **KIWI B-1 Reactor**  
 . . . . KIWI B reactors  
 . . . . **KIWI B-1 Reactor**  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B reactors**  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor
- KIWI B-4 Reactor**  
 GS nuclear electric power generation  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B-4 Reactor**  
 nuclear reactors  
 . gas cooled reactors  
 . . KIWI reactors  
 . . . **KIWI B-4 Reactor**  
 . . . . KIWI B reactors  
 . . . . **KIWI B-4 Reactor**  
 . nuclear power reactors  
 . . KIWI reactors  
 . . . **KIWI B-4 Reactor**  
 . . . . KIWI B reactors  
 . . . . **KIWI B-4 Reactor**  
 . nuclear research and test reactors  
 . . KIWI reactors  
 . . . **KIWI B-4 Reactor**  
 . . . . KIWI B reactors  
 . . . . **KIWI B-4 Reactor**
- KIWI reactors**  
 UF *KIWI rocket reactors*  
 GS nuclear electric power generation  
 . nuclear power reactors  
 . . **KIWI reactors**  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 nuclear reactors  
 . gas cooled reactors  
 . . **KIWI reactors**  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . nuclear power reactors  
 . . **KIWI reactors**  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . nuclear research and test reactors  
 . . **KIWI reactors**  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 RT NRX reactors  
 nuclear engine for rocket vehicles  
 Phoebus nuclear reactor  
 Rover project
- KIWI rocket reactors*  
 USE **KIWI reactors**
- Kjeldahl method**  
 GS chemical tests  
 . chemical analysis  
 . . quantitative analysis  
 . . . **Kjeldahl method**  
 RT ammonia  
 ∞ methodology  
 nitrogen  
 titration
- Klebsiella**  
 GS microorganisms  
 . bacteria  
 . . **Klebsiella**
- Klein-Dunham potential**  
 RT ∞ potential  
 quantum theory
- Klein-Gordon equation**  
 GS wave equations  
 . **Klein-Gordon equation**  
 RT Dirac equation  
 ∞ equations
- klippen*  
 USE **outliers (landforms)**
- klystrons**  
 DEF Electron tubes for converting direct current energy into radio frequency energy by alternately speeding up and slowing down the electrons.  
 GS electron tubes  
 . vacuum tubes  
 . . microwave tubes

## knee (anatomy)

. . . **klystrons**  
microwave equipment  
. microwave tubes  
. . **klystrons**  
RT amplifiers  
catchers  
cavity resonators  
cyclotron resonance devices  
electron bunching  
electron cyclotron heating  
electrostatic generators  
magnetrons  
microwave oscillators

*k-mesons*  
USE **kaons**

**knee (anatomy)**  
GS anatomy  
. limbs (anatomy)  
. . leg (anatomy)  
. . . **knee (anatomy)**  
. musculoskeletal system  
. . joints (anatomy)  
. . . **knee (anatomy)**  
appendages  
. leg (anatomy)  
. . **knee (anatomy)**  
RT femur

*knight shift*  
USE **nuclear magnetic resonance**

**knobs**  
RT handles  
levers  
manual control

**knockout mice**  
(added April 2004)  
DEF Mice whose genome contains a gene whose function has been disrupted, or "knocked-out". Knockout mice are used as animal models for various diseases, such as cystic fibrosis, and help to clarify the functions of genes studied within the fields of immunology, cancer genetics, and developmental biology.  
GS animals  
. vertebrates  
. . mammals  
. . . rodents  
. . . . mice  
. . . . . **knockout mice**  
models  
. animal models  
. . **knockout mice**

**Knoop hardness**  
DEF Relative microhardness as determined by the Knoop diamond-pyramid indentation test.  
GS mechanical properties  
. hardness  
. . microhardness  
. . . **Knoop hardness**  
RT hardness tests  
nanoindentation

**knowledge**  
GS **knowledge**  
. lessons learned  
RT axioms  
documentation  
education  
learning  
literature  
paradoxes  
perception  
philosophy  
textbooks  
training evaluation

**knowledge based systems**  
(added April 1993)  
GS information systems  
. **knowledge based systems**  
. . expert systems  
RT artificial intelligence  
computer techniques  
data structures  
decision support systems

knowledge bases (artificial intelligence)  
knowledge representation  
natural language processing  
pilot support systems

**knowledge bases (artificial intelligence)**  
(added November 1988)  
DEF Facts, assumptions, beliefs, and heuristics, used in dealing with a database to achieve desired results such as a diagnosis, an interpretation, or a solution to a problem.  
GS data bases  
. **knowledge bases (artificial intelligence)**  
RT artificial intelligence  
expert systems  
knowledge based systems  
knowledge representation

*knowledge discovery*  
(added April 2000)  
USE **data mining**

*knowledge extraction*  
(added April 2000)  
USE **data mining**

**knowledge representation**  
DEF The use of symbolic data structures to represent knowledge so that a computer can manipulate them.  
RT artificial intelligence  
belief networks  
cognition  
expert systems  
hypertext  
knowledge based systems  
knowledge bases (artificial intelligence)  
natural language (computers)

*Knudsen cells*  
USE **Knudsen gages**

**Knudsen flow**  
UF *Knudsen number*  
GS fluid flow  
. gas flow  
. . **Knudsen flow**  
. internal flow  
. . ducted flow  
. . . **Knudsen flow**  
RT BGK model  
boundary layer transition  
free molecular flow  
kinetic theory  
mean free path  
molecular flow  
pressure gradients  
rarefied gas dynamics  
transition points  
vacuum  
viscous flow

**Knudsen gages**  
DEF Gages which measure pressure in terms of the net rate of transfer of momentum by molecules between two surfaces maintained at different temperatures and separated by a distance smaller than the mean free path of the gas molecules. Used for Knudsen cells.  
UF *Knudsen cells*  
GS measuring instruments  
. pressure gages  
. . vacuum gages  
. . . **Knudsen gages**  
vacuum apparatus  
. vacuum gages  
. . **Knudsen gages**  
RT ionization gages  
McLeod gages  
Pirani gages  
pressure measurement

radiometers

*Knudsen number*  
USE **Knudsen flow**

**knurling**  
RT grooving  
machining  
metal cutting

**Kohoutek comet**  
GS celestial bodies  
. comets  
. . **Kohoutek comet**  
RT Bessel-Bredichin theory  
∞ coma  
radiation pressure  
solar system

**Kolmogorov theory**  
(added July 1993)  
RT isotropic turbulence  
Lagrange similarity hypothesis  
shear flow  
∞ theories  
turbulent flow  
vortices

**Kolmogorov-Smirnov test**  
(added July 1993)  
GS statistical analysis  
. statistical tests  
. . **Kolmogorov-Smirnov test**  
RT probability theory  
statistical distributions

**k-omega turbulence model**  
(added June 1997)  
UF *kappa-omega turbulence model*  
GS models  
. mathematical models  
. . turbulence models  
. . . **k-omega turbulence model**  
RT computational fluid dynamics  
k-epsilon turbulence model  
turbulent boundary layer  
turbulent flow

**Kondo effect**  
DEF Change in superconductivity characteristics resulting from magnetic impurities in the compounds involved.  
GS electrical properties  
. electrical resistivity  
. . superconductivity  
. . . **Kondo effect**  
transport properties  
. electrical resistivity  
. . superconductivity  
. . . **Kondo effect**  
RT alloys  
∞ effects  
low temperature physics  
magnetic materials  
nuclear spin  
transition temperature

∞ **Korea**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT North Korea  
South Korea

**Korteweg-Devries equation**  
DEF The mathematical representation describing the propagation of long waves of small but finite amplitude.  
GS wave equations  
. **Korteweg-Devries equation**  
RT ∞ equations

**Kossel pattern**  
GS distribution (property)  
. radiation distribution  
. . diffraction patterns  
. . . **Kossel pattern**  
RT crystal lattices

**Kovar (trademark)**  
GS alloys

. **Kovar (trademark)**  
 RT cobalt alloys

**KP index**  
 GS ratios  
 . indexes (ratios)  
 . . **KP index**

RT Earth magnetosphere  
 geomagnetic pulsations  
 geomagnetism  
 ∞ indexes  
 magnetic disturbances  
 magnetic properties  
 magnetic variations

**Kraft process (woodpulp)**  
 DEF Woodpulping process in which sodium sulfate is used in the caustic soda pulp-digestion liquor. Also known as sulfate pulping or Kraft pulping.  
 RT manufacturing  
 paper (material)  
 ∞ processes

**Kramers-Kronig formula**  
 DEF The relationship between the attenuation coefficient and the dispersion (frequency dependent phase velocity) for viscoelastic waves.  
 RT ∞ dispersion  
 ∞ formulas  
 opacity  
 spectrum analysis

**Krebs cycle**  
 RT cells (biology)  
 metabolism

**kreep**  
 DEF A yellow-brown glassy lunar mineral enriched in potassium, rare earth elements, and phosphate.  
 GS minerals  
 . **kreep**  
 rocks  
 . lunar rocks  
 . . **kreep**

RT geology  
 lunar soil  
 phosphates  
 potassium  
 rare earth elements

**kriging**  
 DEF A method of providing unbiased estimates of variables in regions where the available data exhibit spatial autocorrelation, and these estimates are obtained in such a way that they have minimum variance.  
 RT variance (statistics)

*Kronecker product*  
 USE **orthogonality**

**Krook equation**  
 RT ∞ equations  
 hydrodynamics  
 kinetic theory  
 shear flow  
 shock wave profiles

*Krueger flaps*  
 USE **leading edge flaps**

**krypton**  
 GS chemical elements

. rare gases  
 . . **krypton**  
 . . . krypton isotopes  
 . . . . krypton 85  
 gases  
 . rare gases  
 . . **krypton**  
 . . . krypton isotopes  
 . . . . krypton 85

**krypton 85**  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . krypton isotopes  
 . . . . **krypton 85**  
 . . . . radioactive isotopes  
 . . . . . **krypton 85**  
 . rare gases  
 . . krypton  
 . . . krypton isotopes  
 . . . . **krypton 85**  
 gases  
 . rare gases  
 . . krypton  
 . . . krypton isotopes  
 . . . . **krypton 85**

**krypton fluoride lasers**  
 DEF Rare gas halide ultraviolet stimulated emission devices in which krypton fluoride is the active lasing medium.  
 GS stimulated emission devices  
 . lasers  
 . . gas lasers  
 . . . rare gas-halide lasers  
 . . . . **krypton fluoride lasers**

RT coherent electromagnetic radiation  
 lasing  
 masers  
 optical pumping

**krypton isotopes**  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **krypton isotopes**  
 . . . . krypton 85  
 . rare gases  
 . . krypton  
 . . . **krypton isotopes**  
 . . . . krypton 85  
 gases  
 . rare gases  
 . . krypton  
 . . . **krypton isotopes**  
 . . . . krypton 85

*KS-3 aircraft*  
 USE **S-3 aircraft**

*K-T boundary*  
 USE **Cretaceous-Tertiary boundary**

*KU band*  
 USE **superhigh frequencies**

**Kuiper Airborne Observatory**  
 (added June 1990)  
 GS observatories  
 . **Kuiper Airborne Observatory**

RT airborne equipment  
 astronomical spectroscopy  
 C-141 aircraft  
 infrared astronomy

SOFIA (airborne observatory)

**Kuiper belt**  
 (added June 1997)  
 RT asteroids  
 comets  
 dwarf planets  
 New Horizons mission  
 Oort cloud  
 Quaoar  
 solar system  
 solar system evolution  
 trans-Neptunian objects

**Kurile Islands**  
 GS landforms  
 . islands  
 . . Pacific islands  
 . . . **Kurile Islands**

RT U.S.S.R.

**kurtosis**  
 DEF In statistics, the extent to which a frequency distribution is peaked or concentrated about the mean; it is sometimes defined as the ratio of the fourth moment of the distribution to the square of the second moment.  
 GS distribution (property)  
 . frequency distribution  
 . . **kurtosis**

RT ∞ distribution  
 Fourier analysis  
 ∞ patterns  
 statistical distributions

**Kutta-Joukowski condition**  
 GS conditions  
 . **Kutta-Joukowski condition**

RT airfoil profiles  
 boundary layer separation  
 Joukowski transformation

**Kuwait**  
 GS nations  
 . **Kuwait**

RT Asia

**Kvant modules**  
 (added April 1995)  
 GS modules  
 . space station modules  
 . . **Kvant modules**

RT Mir space station  
 Russian Space Program  
 Soyuz spacecraft  
 space station structures  
 x ray telescopes

**KWIC indexes**  
 GS classifications  
 . indexes (documentation)  
 . . **KWIC indexes**

RT ∞ indexes  
 thesauri

*Kyokko satellite*  
 USE **EXOS-A satellite**

**Kyrgyzstan**  
 (added August 1993)  
 GS nations  
 . **Kyrgyzstan**

RT Asia



# L

*L band*  
USE **ultrahigh frequencies**

*L-28 aircraft*  
USE **U-10 aircraft**

*L-29 aircraft*  
USE **L-29 jet trainer**

**L-29 jet trainer**  
UF *Delfin aircraft*  
*L-29 aircraft*  
*Omnipol L-29 aircraft*  
GS jet aircraft  
. **L-29 jet trainer**  
monoplanes  
. **L-29 jet trainer**  
single engine aircraft  
. **L-29 jet trainer**  
tilt wing aircraft  
. **L-29 jet trainer**  
training aircraft  
. **L-29 jet trainer**  
V/STOL aircraft  
. **L-29 jet trainer**

**L-1011 aircraft**  
GS commercial aircraft  
. **L-1011 aircraft**  
jet aircraft  
. **L-1011 aircraft**  
Lockheed aircraft  
. **L-1011 aircraft**  
passenger aircraft  
. **L-1011 aircraft**  
transport aircraft  
. **L-1011 aircraft**  
RT ∞ aircraft  
turbofan engines

**L-2000 aircraft**  
UF *Lockheed L-2000 aircraft*  
GS jet aircraft  
. **L-2000 aircraft**  
Lockheed aircraft  
. **L-2000 aircraft**  
passenger aircraft  
. **L-2000 aircraft**  
supersonic aircraft  
. supersonic transports  
. . **L-2000 aircraft**  
transport aircraft  
. **L-2000 aircraft**  
RT ∞ aircraft

*labeling (marking)*  
USE **marking**

**lab-on-a-chip devices**  
(added August 2009)  
DEF Integrated microfluidic/semiconductor devices capable of performing one or more laboratory functions on a single chip.  
UF *LOC (microelectronics)*  
GS chips (electronics)  
. **lab-on-a-chip devices**  
electromechanical devices  
. microelectromechanical systems  
. . **lab-on-a-chip devices**  
microfluidic devices  
. **lab-on-a-chip devices**  
RT assaying  
bioassay  
chemical detection  
medical electronics  
microanalysis  
microminiaturization  
nanotechnology  
photolithography  
spacecraft contamination  
systems-on-a-chip

**labor**  
RT manpower  
mediation  
personnel selection

**laboratories**  
GS **laboratories**

. engine testing laboratories  
. environmental laboratories  
. human factors laboratories  
. lunar laboratories  
. . lunar receiving laboratory  
. lunar mobile laboratories  
. space laboratories  
. . Advanced Technology Laboratory  
. . Atmospheric Cloud Physics Lab (Spacelab)  
. . Earth Viewing Applications Laboratory  
. . Long Duration Exposure Facility  
. . manned orbital laboratories  
. . . Columbus module  
. . . Destiny Laboratory Module  
. . . Kibo Japanese Experiment Module  
. . . Skylab 1  
. . . Skylab 2  
. . . Skylab 3  
. . . Skylab 4  
. . Spacelab  
. . underwater research laboratories  
RT experiment design  
experimentation  
nuclear research  
research facilities  
SAIL project  
test facilities  
∞ tests

**laboratory astrophysics**  
(added June 2004)  
DEF Investigation of the formation, properties, and interactions of interstellar matter conducted through laboratory experimentation.  
GS astrophysics  
. **laboratory astrophysics**  
RT astronomical spectroscopy  
computational astrophysics  
cosmochemistry  
interstellar chemistry  
interstellar matter  
molecular clouds

**laboratory equipment**  
GS **laboratory equipment**  
. gloveboxes  
. image furnaces  
. syringes  
RT ampoules  
∞ equipment  
glassware  
measuring instruments  
pipettes

**Labrador**  
RT Canada

**labyrinth**  
GS anatomy  
. sense organs  
. . ear  
. . . **labyrinth**  
. . . . cochlea  
. . . . Corti organ  
. . . . otolith organs  
. . . . semicircular canals  
. . . . vestibules

**labyrinth seals**  
DEF Minimum leakage seals that offer resistance to fluid flow while providing radial or axial clearance.  
GS seals (stoppers)  
. **labyrinth seals**  
RT fluid flow  
gaskets  
glands (seals)  
hermetic seals  
leakage  
O ring seals  
packings (seals)  
plugs  
pump seals

rotor speed

**labyrinthectomy**  
GS medical science  
. surgery  
. . **labyrinthectomy**  
RT ear

**LACATE (experiment)**  
DEF A NASA balloonborne experiment conducted from a balloon platform carried by a balloon over 400 feet in diameter. The acronym stands for the Lower Atmospheric Composition and Temperature Experiment. The experiment was conducted in 1974. Used for Lower Atmospheric Composition Experiment.  
UF *Lower Atmospheric Composition Experiment*  
RT atmospheric composition  
atmospheric temperature  
lower atmosphere

*LACE (engine)*  
USE **liquid air cycle engines**

**lacquers**  
GS coatings  
. **lacquers**  
finishes  
. **lacquers**  
RT metal coatings  
primers (coatings)  
protective coatings  
sprayed coatings

**lactates**  
GS esters  
. **lactates**

**lactic acid**  
GS acids  
. carboxylic acids  
. . **lactic acid**  
organic compounds  
. carboxylic acids  
. . **lactic acid**

**lactose**  
GS organic compounds  
. carbohydrates  
. . sugars  
. . . **lactose**

**lacunas**  
RT lichens  
plants (botany)

**ladders**  
RT escalators  
stairways

*lag (delay)*  
USE **time lag**

**LAGEOS (satellite)**  
UF *Laser Geodynamic Satellite*  
GS artificial satellites  
. passive satellites  
. . **LAGEOS (satellite)**  
RT laser range finders  
retroreflection  
satellite laser ranging

**lagoons**  
DEF Shallow stretches of seawater, such as sounds, channels, bays (topographic features), or saltwater lakes, near or communicating with seas and partly or completely separated from them by low, narrow, elongated strips of land, such as reefs, barrier islands, sandbanks, or spits. Lagoons are often used to describe sheets of water between offshore coral reefs and the mainland. They often extend roughly parallel to the coast and are little affected by tides. Lagoons are also considered shallow freshwater ponds or lakes near or communicating with larger lakes or rivers.  
GS landforms  
. **lagoons**

RT atolls  
bars (landforms)  
beaches  
coasts  
dunes  
inlets (topography)  
island arcs  
islands  
lakes  
ponds  
reservoirs  
topography

**Lagrange coordinates**

DEF Systems of coordinates by which fluid parcels are identified for all times by assigning them coordinates which do not vary with time. Examples of such coordinates are: (a) the values of any properties of the fluid conserved in the motion; or (b) more generally, the positions in space of the parcels at some arbitrarily selected moment. Subsequent positions in space of the parcels are then the dependent variables, functions of time and of the Lagrange coordinates. Also called material coordinates.

GS coordinates  
. **Lagrange coordinates**

RT classical mechanics  
hydrodynamics  
Lagrangian function  
librational motion

*Lagrange equations of motion*

USE **Euler-Lagrange equation**

**Lagrange multipliers**

RT chiral dynamics  
differential equations  
isoperimetric problem  
Lagrangian function  
multipliers  
operations research  
optimization

**Lagrange similarity hypothesis**

GS hypotheses  
. **Lagrange similarity hypothesis**  
theorems  
. similarity theorem  
. . **Lagrange similarity hypothesis**

RT energy dissipation  
energy transfer  
kinetic energy  
Kolmogorov theory  
turbulent flow

*Lagrangian*

USE **Lagrangian function**

**Lagrangian equilibrium points**

GS gravitational effects  
. **Lagrangian equilibrium points**  
theorems  
. similarity theorem

RT celestial mechanics  
gravitational fields  
orbital mechanics  
Trojan asteroids

**Lagrangian function**

(added April 1993)  
UF *Lagrangian*  
GS functions (mathematics)  
. **Lagrangian function**

RT Euler-Lagrange equation  
kinetic energy  
Lagrange coordinates  
Lagrange multipliers  
potential energy

**Laguerre functions**

GS analysis (mathematics)  
. complex variables  
. . **Laguerre functions**  
functions (mathematics)  
. **Laguerre functions**

RT orthogonal functions

*LA-ICP-MS (spectrometry)*  
(added March 2001)

USE **inductively coupled plasma mass spectrometry**

*lake beds*

USE **beds (geology)**

**Lake Champlain Basin (NY-VT)**

GS landforms  
. structural basins  
. . **Lake Champlain Basin (NY-VT)**

RT Canada  
lakes  
New York  
Vermont

**Lake Erie**

GS lakes  
. Great Lakes (North America)  
. . **Lake Erie**

RT hydrology  
rivers  
streams  
water  
water management

**Lake Huron**

GS lakes  
. Great Lakes (North America)  
. . **Lake Huron**

RT hydrology  
rivers  
Saginaw Bay (MI)  
streams  
water  
water management

**lake ice**

DEF Ice formed on lakes, regardless of observed location; it is usually freshwater ice.

GS ice  
. **lake ice**  
. . ice floes

RT bay ice  
ice formation  
lakes  
land ice  
sea ice  
water

**Lake Michigan**

GS lakes  
. Great Lakes (North America)  
. . **Lake Michigan**

RT hydrology  
rivers  
streams  
water  
water management

**Lake Ontario**

GS lakes  
. Great Lakes (North America)  
. . **Lake Ontario**

RT hydrology  
rivers  
streams  
water  
water management

**Lake Pontchartrain (LA)**

GS lakes  
. **Lake Pontchartrain (LA)**

RT Louisiana

**Lake Superior**

GS lakes  
. Great Lakes (North America)  
. . **Lake Superior**

RT hydrology  
rivers  
streams  
water  
water management

**Lake Tahoe (CA-NV)**

GS lakes  
. **Lake Tahoe (CA-NV)**

RT California  
Nevada

**Lake Texoma (OK-TX)**

GS lakes  
. **Lake Texoma (OK-TX)**

RT limnology  
Oklahoma  
reservoirs  
texas  
vadose water

**lakes**

DEF Inland bodies of standing water occupying depressions in the Earth's surface, generally of appreciable size (larger than a pond) and too deep to permit vegetation (excluding sub-aqueous vegetation) to take root completely across the expanse of water; the water may be fresh or saline. The term includes expanded parts of rivers, reservoirs behind dams, or lake basins intermittently or formerly covered by water.

GS **lakes**  
. Great Lakes (North America)

. . Lake Erie  
. . Lake Huron  
. . Lake Michigan  
. . Lake Ontario  
. . Lake Superior  
. Great Salt Lake (UT)  
. Lake Pontchartrain (LA)  
. Lake Tahoe (CA-NV)  
. Lake Texoma (OK-TX)  
. Pyramid Lake (NV)

RT aquifers  
bayous  
beaches  
coasts  
Earth hydrosphere  
eutrophication  
inland waters  
kettles (geology)  
lagoons  
Lake Champlain Basin (NY-VT)  
lake ice  
limnology  
playas  
ponds  
regional planning  
reservoirs  
river basins  
shoals  
shorelines  
springs (water)  
straits  
surface water  
thermal pollution  
water circulation  
water color  
water depth  
water resources  
waterways

**Lallemand cameras**

GS optical equipment  
. cameras  
. . **Lallemand cameras**  
photographic equipment  
. cameras  
. . **Lallemand cameras**

RT astronomical photography  
electro-optical photography  
image converters  
image intensifiers  
image transducers  
light amplifiers  
spectroscopy  
television cameras

**Lamb waves**

DEF Waves that propagate within the thickness of a thin plate, and that can only be generated at particular values of angle of incidence, frequency, and plate thickness. The velocity of the wave is dependent on the mode and the product of plate thickness and frequency.

GS elastic waves  
. sound waves  
. . **Lamb waves**

## Lambda rocket vehicles

RT acoustic properties  
acoustics  
Sturm-Liouville theory  
ultrasonic tests

**Lambda rocket vehicles**  
GS rocket vehicles  
. multistage rocket vehicles  
. . . **Lambda rocket vehicles**  
. sounding rockets  
. . . **Lambda rocket vehicles**  
RT solid propellant rocket engines  
∞ vehicles

**Lambda Tauri stars**  
GS celestial bodies  
. stars  
. . double stars  
. . . binary stars  
. . . . eclipsing binary stars  
. . . . . **Lambda Tauri stars**  
. . variable stars  
. . . **Lambda Tauri stars**

*Lambert law*  
USE **Bouguer law**

**Lambert surface**  
RT reflection  
∞ surface geometry  
∞ surfaces

**Lame functions**  
GS functions (mathematics)  
. **Lame functions**  
RT boundary value problems  
differential equations

**Lame wave equations**  
GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . **Lame wave equations**  
wave equations  
. **Lame wave equations**  
RT acoustics  
elastic waves  
∞ equations  
Sturm-Liouville theory  
wave propagation

**lamella**  
RT bones

**lamella (metallurgy)**  
DEF Crystalline materials whose grains are in the form of thin sheets.  
RT aluminum alloys  
copper alloys  
crystallography  
eutectic alloys  
microstructure

*lamina*  
USE **layers**

**laminar boundary layer**  
DEF In fluid flow, layer next to the fixed boundary. The fluid velocity is zero at the boundary layer but the molecular viscous stress is large because the velocity gradient normal to the wall is large. Used for laminar boundary layer separation and laminar flow control.  
UF *laminar boundary layer separation*  
*laminar flow control*  
GS boundary layers  
. **laminar boundary layer**  
RT boundary layer combustion  
boundary layer transition  
compressible boundary layer  
Goertler instability  
hypersonic boundary layer  
incompressible boundary layer  
interactional aerodynamics  
isothermal layers  
Pohlhausen method  
supersonic boundary layers  
thermal boundary layer  
three dimensional boundary layer  
turbulent boundary layer

two dimensional boundary layer  
X-21 aircraft

*laminar boundary layer separation*  
USE **boundary layer separation**  
**laminar boundary layer**

*laminar flames*  
USE **flames**  
**laminar flow**

**laminar flow**  
DEF In fluid flow, a smooth flow in which no crossflow of fluid particles occurs between adjacent stream lines; hence, a flow conceived as made up of layers -- commonly distinguished from turbulent flow. Used for laminar flames, laminar jets, Poiseuille flow, and streamline flow.  
UF *laminar flames*  
*laminar jets*  
*Poiseuille flow*  
*streamline flow*  
GS fluid flow  
. **laminar flow**  
. . Blasius flow  
. . Hartmann flow  
. . stratified flow  
RT aerodynamics  
atmospheric turbulence  
boundary layer transition  
capillary flow  
critical flow  
Falkner-Skan equation  
flow characteristics  
flow geometry  
flow stability  
forced convection  
free convection  
gas flow  
gas streams  
inviscid flow  
liquid flow  
low Reynolds number  
mass flow  
multiphase flow  
Newton pressure law  
open channel flow  
orifice flow  
parallel flow  
pipe flow  
Prandtl-Meyer expansion  
Rayleigh-Benard convection  
Reynolds number  
Roshko prediction  
single-phase flow  
steady flow  
steam flow  
Tollmien-Schlichting waves  
∞ transition layers  
turbulent flow  
two phase flow  
uniform flow  
unsteady flow  
viscous drag  
viscous flow  
wedge flow  
X-21A aircraft

**laminar flow airfoils**  
GS airfoils  
. **laminar flow airfoils**

*laminar flow control*  
USE **boundary layer control**  
**laminar boundary layer**

**laminar heat transfer**  
GS transmission  
. heat transmission  
. . heat transfer  
. . . **laminar heat transfer**  
RT conductive heat transfer  
convective heat transfer  
thermohydraulics

turbulent heat transfer

*laminar jets*  
USE **jet flow**  
**laminar flow**

**laminar mixing**  
GS mixing  
. **laminar mixing**  
RT fluid injection  
gas mixtures  
mixing layers (fluids)  
turbulent mixing

**laminar wakes**  
GS wakes  
. **laminar wakes**  
RT aircraft wakes  
turbulent wakes

*laminated materials*  
USE **laminates**

**laminates**  
DEF Products made by bonding together two or more layers of material or materials. Used for laminated materials, laminations, and multi-layer structures.  
UF *laminated materials*  
*laminations*  
*multilayer structures*  
GS composite structures  
. **laminates**  
. . Boral  
. . plywood  
RT bonding  
boron-epoxy composites  
cladding  
clamped structures  
coatings  
composite materials  
debonding (materials)  
fabrics  
fiber composites  
filament winding  
∞ films  
formica  
glass fiber reinforced plastics  
honeycomb structures  
hybrid composites  
interlaminar stress  
interlayers  
∞ layers  
lay-up  
magnetic cores  
∞ materials  
matrix materials  
metal bonding  
metallizing  
multilayer insulation  
netting (materials/structures)  
papers  
plating  
ply orientation  
polymer matrix composites  
prepregs  
reinforced plastics  
reinforced plates  
sandwich structures  
∞ sheets  
stacking sequence (composite materials)  
substrates  
thermosetting resins  
veneers

*laminations*  
USE **laminates**

*lamps*  
USE **luminaires**

*LAMPS program*  
USE **Light Airborne Multipurpose System**

*LAN (computer networks)*  
USE **local area networks**

**Lance missile**  
GS missiles

- . surface to surface missiles
- . . **Lance missile**
- RT liquid propellant rocket engines
- Trailblazer 1 reentry vehicle
- TX-77 engine

**land**

DEF In a general sense, that part of the Earth's surface that stands above mean sea level. The inclusion of Antarctica's permanent ice in calculating the land surface of the Earth is controversial.

GS **land**

- . Allegheny Plateau (US)
- . arid lands
- . badlands
- . barren land
- . Cascade Range (CA-OR-WA)
- . Colorado Plateau (US)
- . deserts
  - . . Gobi desert
  - . . Libyan desert
  - . . Mojave Desert (CA)
  - . . Sahara Desert (Africa)
- . farmlands
- . grasslands
- . . Llanos Orientales (Colombia)
- . isthmuses
- . parks
  - . . national parks
  - . . . Yellowstone National Park (ID-MT-WY)
- . plains
  - . . coastal plains
  - . . flood plains
  - . . Llanos Orientales (Colombia)
  - . . pampas
  - . . playas
  - . . tundra
  - . . rangelands
  - . . wetlands
  - . . marshlands
- RT capes (landforms)
- desertification
- desertline
- peninsulas
- residential areas
- rural areas
- rural land use
- sites
- sod
- soils
- topography

**land ice**

DEF Any ice masses formed from snow, rain or other freshwater on land, as ice shelves or glaciers, even though they may be floating in seas as icebergs.

- UF *ice shelves*
- GS ice

- . **land ice**
- resources
- . Earth resources
- . . **land ice**
- RT Antarctic regions
- glacial drift
- glaciers
- icebergs
- lake ice
- sea ice

**land management**

- GS management
  - . resources management
  - . . **land management**
- RT environment management
- regional planning
- rural land use
- urban planning
- wilderness

**land mobile satellite service**

DEF A proposed radio relay satellite system for serving thinly populated or large geographical areas.

- GS mobile communication systems
- . **land mobile satellite service**
- RT communication satellites
- ground stations

- MSAT
- radio communication

**land surface temperature**

(added February 1993)

- GS surface properties
  - . surface temperature
  - . . **land surface temperature**
- temperature
  - . surface temperature
  - . . **land surface temperature**
- RT air land interactions
- atmospheric temperature
- sea surface temperature

**land use**

- GS **land use**
  - . rural land use
- RT AgRISTARS project
- airport planning
- barren land
- change detection
- conservation
- desertification
- ∞ development
- Earth resources
- economic development
- energy policy
- environment management
- exploitation
- ∞ facilities
- farmlands
- forest management
- grasslands
- industrial areas
- landfills
- leasing
- residential areas
- site selection
- SPOT (French satellite)
- Starsite program
- suburban areas
- urban development
- urban planning
- urban research

**Landau damping**

DEF The damping of a space charge wave by electrons which move at the phase velocity of the wave and gain energy transferred from the wave.

- GS damping
- . **Landau damping**
- RT electron plasma
- Landau factor
- magnetic damping
- phase velocity
- plasma waves
- space charge

**Landau factor**

- RT atomic energy levels
- atomic theory
- Landau damping
- plasmas (physics)
- superconductivity

**Landau-Ginzburg equations**

- RT ∞ equations
- quantum electrodynamics
- superconductivity

**landfills**

DEF Disposal sites for solid wastes which are buried in layers of earth.

- RT industrial wastes
- land use
- methane
- solid wastes
- waste disposal
- waste management
- waste utilization
- water pollution

**landforms**

DEF Any physical recognizable forms or features of the Earth's surface, having characteristic shapes, and produced by natural causes. Landforms include major forms such as plains, plateaus, and mountains and minor forms such

as hills, valleys, slopes, glacial drift, and dunes. Taken together, landforms make up the surface configuration of the Earth.

GS **landforms**

- . arroyos
- . barriers (landforms)
- . . Outer Banks (NC)
- . . reefs
- . bars (landforms)
- . beds (geology)
- . . salt beds
- . bridges (landforms)
- . calderas
- . canals
- . canyons
- . . Grand Canyon (AZ)
- . capes (landforms)
- . . Cape Hatteras (NC)
- . cones (volcanoes)
- . cusps (landforms)
- . Death Valley (CA)
- . deltas
- . . Mississippi Delta (LA)
- . . Rhone Delta (France)
- . divides (landforms)
- . dunes
- . escarpments
- . fans (landforms)
- . fiords
- . flats (landforms)
- . . tidal flats
- . gaps (geology)
- . inlets (topography)
- . . bayous
- . . Cook Inlet (AK)
- . inliers (landforms)
- . island arcs
- . islands
  - . . Aleutian Islands (US)
  - . . Assateague Island (MD-VA)
  - . . atolls
  - . . Azores
  - . . Bahrain
  - . . Bermuda
  - . . Canary Islands
  - . . Cyprus
  - . . Greenland
  - . . Hawaii
  - . . Iceland
  - . . Indonesia
  - . . Ireland
  - . . keys (islands)
  - . . Long Island (NY)
  - . . Madagascar
  - . . Maldives Islands
  - . . Malta
  - . . Mauritius
  - . . Merritt Island (FL)
  - . . Newfoundland
  - . . nunataks
  - . . Pacific islands
    - . . . Guam
    - . . . Japan
    - . . . Johnston Island
    - . . . Kurile Islands
    - . . . New Guinea (island)
    - . . . New Zealand
    - . . . Philippines
    - . . . Samoa
    - . . . Prince Edward Island
    - . . . Seychelles
    - . . . Sicily
    - . . . Tasmania
    - . . . Wallops Island
  - . . West Indies
    - . . . Antigua and Barbuda
    - . . . Bahamas
    - . . . Barbados
    - . . . Cuba
    - . . . Dominica
    - . . . Grenada
    - . . . Guadeloupe
    - . . . Haiti
    - . . . Jamaica
    - . . . Lesser Antilles
    - . . . Martinique
    - . . . Puerto Rico
    - . . . Trinidad and Tobago
    - . . . Virgin Islands

# landing

- . isthmuses
- . lagoons
- . Magdalena-Cauca Valley (Colombia)
- . massifs
- . mountains
  - .. Adirondack Mountains (NY)
  - .. Alps Mountains (Europe)
  - .. Andes Mountains (South America)
  - .. Appalachian Mountains (North America)
  - .. Bighorn Mountains (MT-WY)
  - .. Black Hills (SD-WY)
  - .. Carpathian Mountains (Europe)
  - .. Cascade Range (CA-OR-WA)
  - .. Caucasus Mountains (U.S.S.R.)
  - .. coastal ranges (CA)
  - .. Great Smoky Mountains (NC-TN)
  - .. Himalayas
  - .. Peninsular Ranges (CA)
  - .. Pyrenees Mountains (Europe)
  - .. Rocky Mountains (North America)
  - .. San Juan Mountains (CO)
  - .. Sierra Nevada Mountains (CA)
  - .. Wind River Range (WY)
  - .. Wrangell Mountains (AK)
- . muskegs
- . outliers (landforms)
- . peaks (landforms)
  - .. Pike's Peak (CO)
- . peninsulas
  - .. Delmarva Peninsula (DE-MD-VA)
  - .. Phoenix quadrangle (AZ)
- . plains
  - .. coastal plains
  - .. flood plains
  - .. Llanos Orientales (Colombia)
  - .. pampas
  - .. playas
  - .. tundra
  - .. ravines
  - .. St Lawrence Valley (North America)
- . steppes
- . structural basins
  - .. cirques (landforms)
  - .. Great Basin (US)
  - .. Kalahari Basin (Africa)
  - .. karst
    - ... sinkholes
    - ... kettles (geology)
  - .. Lake Champlain Basin (NY-VT)
  - .. river basins
    - ... Atchafalaya River Basin (LA)
    - ... Chena River Basin (AK)
    - ... Columbia River Basin (ID-OR-WA)
    - ... Delaware River Basin (US)
    - ... Feather River Basin (CA)
    - ... Missouri River Basin (US)
    - ... Susquehanna River Basin (MD-NY-PA)
    - ... Wabash River Basin (IL-IN-OH)
  - .. wadis
  - .. watersheds
  - .. Williston Basin (North America)
- . terraces (landforms)
- . plateaus
  - ... Allegheny Plateau (US)
  - ... Colorado Plateau (US)
  - ... Great Basin (US)
  - ... mesas
  - ... buttes
  - ... piedmonts
  - ... Central Piedmont (US)
- . volcanoes
  - .. Mars volcanoes
- RT archipelagoes
- crossbedding (geology)
- ditches
- earthquake resistance
- ∞ faults
- geological faults
- glacial drift
- landmarks
- landslides
- ∞ platforms
- ∞ ridges
- seamounts
- slopes
- structural properties (geology)

terrain  
topography

## landing

GS **landing**

- . aircraft landing
- . blind landing
- . glide landings
- .. horizontal spacecraft landing
- . hard landing
- . soft landing
- . spacecraft landing
- .. horizontal spacecraft landing
- .. lunar landing
- .. planetary landing
- ... Mars landing
- . ditching (landing)
- . emergency landing
- . touchdown
- . vertical landing
- . water landing

RT air traffic control  
approach  
approach and landing tests (STS)  
arrivals  
guidance (motion)  
instrument flight rules  
instrument landing systems  
maneuvers  
runways  
takeoff  
visual flight

## landing aids

UF *landing systems*

GS **landing aids**

- . airport beacons
- .. discrete address beacon system
- . airport lights
- .. runway lights
- . arresting gear
- . instrument landing systems
- .. all-weather landing systems
- . landing instruments
- .. approach indicators
- . landing radar
- . microvision landing aid
- . microwave landing systems
- .. microwave scanning beam landing system

RT ∞ aids  
air traffic control  
air traffic controllers (personnel)  
airborne radar approach  
aircraft equipment  
aircraft instruments  
aircraft landing  
aircraft safety  
airport towers  
airports  
antiskid devices  
approach  
approach control  
automatic pilots  
enhanced vision  
ground based control  
ground support equipment  
head-up displays  
heliports  
instrument approach  
military air facilities  
National Aviation System  
navigation aids  
PLAT system  
radar approach control  
radio beacons  
runways  
safety devices  
solar compasses

## landing gear

DEF The apparatus comprising those components of an aircraft or spacecraft that support and provide mobility for the craft on land, water, or other surface. The landing gear consists of wheels, floats, skis, bogies, and treads, or other devices, together with all associated struts, bracing, or shock absorbers. Used for retractable landing gear.

UF *retractable landing gear*

RT aircraft parts  
aircraft tires  
airframes

∞ bicycle  
brakes (for arresting motion)  
carriages  
fairings  
floats

∞ gear  
hydrofoils  
nose wheels  
retractable equipment  
self alignment  
shock absorbers  
skidding  
skis  
spray ingestion  
tires  
undercarriages  
vehicle wheels  
wheel brakes  
wheels

## landing instruments

GS landing aids

. **landing instruments**

- .. approach indicators

RT air traffic control  
aircraft equipment  
aircraft instruments  
altimeters  
automatic control  
blind landing  
flight instruments  
instrument landing systems  
manual control  
measuring instruments  
radar approach control  
speed indicators

## landing loads

GS loads (forces)

- . dynamic loads
- .. transient loads
- ... **landing loads**

RT deceleration  
impact loads  
shock loads  
structural design criteria

## landing mats

RT aircraft landing  
airports  
military air facilities  
runways

## landing modules

GS modules

- . spacecraft modules
- .. **landing modules**
  - ... lunar landing modules
  - ... Lunar Module
  - ... Apollo lunar experiment module
  - ... LSSM
  - ... Lunar Module 5
  - ... Lunar Module 7
  - ... Altair Lunar Lander
  - ... Mars Excursion Module
- . soft landing spacecraft
- . **landing modules**
  - .. lunar landing modules
  - ... Lunar Module
  - ... Apollo lunar experiment module
  - ... LSSM
  - ... Lunar Module 5
  - ... Lunar Module 7
  - ... Altair Lunar Lander
  - .. Mars Excursion Module
- . spacecraft components
- . spacecraft modules
- .. **landing modules**
  - ... lunar landing modules
  - ... Lunar Module
  - ... Apollo lunar experiment module
  - ... LSSM
  - ... Lunar Module 5
  - ... Lunar Module 7
  - ... Altair Lunar Lander

... Mars Excursion Module  
 RT Apollo spacecraft  
 interplanetary spacecraft  
 launch vehicles  
 maneuverable spacecraft  
 manned spacecraft  
 reentry vehicles  
 reusable spacecraft  
 space capsules  
 spacecraft docking modules

**landing radar**

GS landing aids  
 . **landing radar**  
 radar  
 . **landing radar**  
 RT air traffic control  
 aircraft landing  
 aircraft safety  
 approach control  
 instrument approach  
 radar approach control

**landing simulation**

GS simulation  
 . **landing simulation**  
 RT altitude simulation  
 atmospheric entry simulation  
 computerized simulation  
 flight simulation  
 spacecraft landing  
 training simulators

**landing sites**

GS sites  
 . **landing sites**  
 . . lunar landing sites  
 . . Mars landing sites  
 RT heliports  
 Mars Pathfinder  
 recovery zones  
 runways  
 trajectory control

**landing speed**

GS rates (per time)  
 . **landing speed**  
 velocity  
 . **landing speed**  
 RT high speed  
 low speed

*landing systems*

USE **landing aids**

**landmarks**

RT landmarks  
 terrain  
 topography

**Landsat 1**

UF *Earth Resources Technology Satellite 1*  
*ERTS-A*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 1**

**Landsat 2**

UF *Earth Resources Technology Satellite B*  
*ERTS-B*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 2**

**Landsat 3**

DEF The third Landsat satellite (Landsat C) successfully launched and in orbit. Used for Earth Resources Technology Satellite C and ERTS-C.  
 UF *Earth Resources Technology Satellite C*  
*ERTS-C*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 3**

RT plasma interaction experiment

**Landsat 4**

UF *Earth Resources Technology Satellite D*  
*ERTS-D*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 4**  
 RT thematic mappers (LANDSAT)

**Landsat 5**

GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 5**  
 RT thematic mappers (LANDSAT)

**Landsat 6**

(added April 1995)  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 6**  
 RT Earth Observing System (EOS)  
 remote sensing  
 spectral resolution

**Landsat 7**

(added April 1995)  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat 7**  
 RT Earth Observing System (EOS)  
 remote sensing  
 spectral resolution

**Landsat E**

UF *Earth Resources Technology Satellite E*  
*EOS-A*  
*ERTS-E*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat E**

**Landsat F**

UF *Earth Resources Technology Satellite F*  
*EOS-B*  
*ERTS-F*  
 GS artificial satellites  
 . Landsat satellites  
 . . **Landsat F**

**Landsat follow-on missions**

UF *LFO*  
 RT ∞ missions  
 multimission modular spacecraft

**Landsat satellites**

UF *Earth Resources Technology Satellites*  
*ERTS*  
 GS artificial satellites  
 . **Landsat satellites**  
 . . Landsat 1  
 . . Landsat 2  
 . . Landsat 3  
 . . Landsat 4  
 . . Landsat 5  
 . . Landsat 6  
 . . Landsat 7  
 . . Landsat E  
 . . Landsat F  
 RT AgRISTARS project  
 data products  
 Earth observations (from space)  
 Earthnet  
 Mapsat  
 NASA programs  
 oceanography  
 satellite observation  
 SEASAT 1  
 SEASAT program  
 SEASAT satellites  
 SEASAT-B satellite

Synchronous Earth Observatory satellite

*landscape*

USE **terrain**  
**topography**

**landslides**

DEF A general term covering a wide variety of mass movement landforms and processes involving the downslope transport, under gravitational influence, of soil and rock material en masse. Usually the displaced material moves over a relatively confined zone or surface of shear.

GS Earth movements

. **landslides**

RT cliffs

flood damage

landforms

rain erosion

rocks

slopes

soil erosion

soils

storm damage

*lanes*

USE **paths**

**Langevin formula**

RT dispersing

ferromagnetism

magnetic moments

**Langley complex coordinator**

GS simulators

. environment simulators

. . space simulators

. . . **Langley complex coordinator**

RT flight simulators

gravitational effects

rotating environments

space environment simulation

weightlessness simulation

*Langmuir monolayers*

(added March 2001)

USE **monomolecular films**

*Langmuir probes*

USE **electrostatic probes**

**Langmuir turbulence**

(added August 1994)

GS turbulence

. magnetohydrodynamic turbulence

. . plasma turbulence

. . . **Langmuir turbulence**

RT Auger effect

magnetohydrodynamic stability

plasma dynamics

plasma heating

plasma oscillations

plasma waves

thin films

**Langmuir-Blodgett films**

(added March 1993)

GS thin films

. monomolecular films

. . **Langmuir-Blodgett films**

RT coatings

∞ films

integrated optics

molecular electronics

polymeric films

**language programming**

GS computer programming

. **language programming**

RT computer assisted instruction

data processing

high level languages

languages

machine oriented languages

machine translation

symbolic programming

# languages

∞ translators

## languages

- GS **languages**
  - . command languages
  - . . . query languages
  - . document markup languages
  - . English language
  - . hardware description languages
  - . programming languages
  - . . . ALGOL
  - . . . APL (programming language)
  - . . . Assembly language
  - . . . . autocoders
  - . . . . COMPASS (programming language)
  - . . . . MAP (programming language)
  - . . . . BASIC (programming language)
  - . . . Cobol
  - . . . COGO (programming language)
  - . . . context free languages
  - . . . Forth (programming language)
  - . . . FORTRAN
  - . . . HAL/S (language)
  - . . . high level languages
  - . . . . Ada (programming language)
  - . . . . C (programming language)
  - . . . . C++ (programming language)
  - . . . . Java (programming language)
  - . . . LISP (programming language)
  - . . . machine oriented languages
  - . . . natural language (computers)
  - . . . Pascal (programming language)
  - . . . PL/1
  - . . . Prolog (programming language)
- RT alphabets
  - articulation (speech)
  - coding
  - communication theory
  - grammars
  - language programming
  - linguistics
  - machine translation
  - orthography
  - phonemes
  - phonemics
  - phonetics
  - semantics
  - sentences
  - speech
  - symbols
  - syntax
  - translating
  - verbal communication
  - vowels
  - words (language)

*lanthanide series metals*

USE **rare earth elements**

## lanthanum

- GS chemical elements
  - . rare earth elements
  - . . . **lanthanum**
  - . . . lanthanum isotopes
- metals
  - . rare earth elements
  - . . . **lanthanum**
  - . . . lanthanum isotopes
- RT didymium

*lanthanum 140*

USE **lanthanum isotopes**

## lanthanum alloys

- GS alloys
  - . rare earth alloys
  - . . . **lanthanum alloys**

## lanthanum chlorides

- GS halogen compounds
  - . chlorine compounds
  - . . . chlorides
  - . . . . **lanthanum chlorides**
  - . halides
  - . . . chlorides
  - . . . . **lanthanum chlorides**
  - . . . metal halides
  - . . . . **lanthanum chlorides**
- lanthanum compounds

## lanthanum chlorides

## lanthanum compounds

- GS **lanthanum compounds**
    - . lanthanum chlorides
    - . lanthanum fluorides
    - . lanthanum oxides
    - . lanthanum tellurides
  - RT ∞ chemical compounds
  - ∞ metal compounds
- ## lanthanum fluorides
- GS halogen compounds
    - . fluorine compounds
    - . . . fluorides
    - . . . . metal fluorides
    - . . . . . **lanthanum fluorides**
    - . halides
    - . . . fluorides
    - . . . . metal fluorides
    - . . . . . **lanthanum fluorides**
    - . . . metal halides
    - . . . . metal fluorides
    - . . . . . **lanthanum fluorides**
  - lanthanum compounds
  - . **lanthanum fluorides**

## lanthanum isotopes

- UF *lanthanum 140*
- GS chemical elements
  - . nuclides
  - . . . isotopes
  - . . . . **lanthanum isotopes**
  - . . . rare earth elements
  - . . . lanthanum
  - . . . . **lanthanum isotopes**
  - . metals
  - . . . rare earth elements
  - . . . lanthanum
  - . . . . **lanthanum isotopes**

## lanthanum oxides

- GS chalcogenides
  - . oxides
  - . . . metal oxides
  - . . . . **lanthanum oxides**
- lanthanum compounds
- . **lanthanum oxides**

## lanthanum tellurides

- GS chalcogenides
  - . tellurides
  - . . . **lanthanum tellurides**
- lanthanum compounds
- . **lanthanum tellurides**
- rare earth compounds
- . **lanthanum tellurides**
- tellurium compounds
- . tellurides
- . . . **lanthanum tellurides**

## Laos

- GS nations
  - . **Laos**
- RT Asia

## lap joints

- GS joints (junctions)
  - . **lap joints**
- RT bolted joints
- butt joints
- metal joints
- riveted joints
- scarf joints
- soldered joints
- welded joints

## Laplace equation

- RT ∞ equations
  - harmonic functions
  - partial differential equations
  - Poisson equation
  - Stokes-Beltrami equation

*Laplace operators*

USE **Laplace transformation**

## Laplace transformation

- UF *Laplace operators*
- GS analysis (mathematics)

- . functional analysis
- . . . integral transformations
- . . . . **Laplace transformation**
- functions (mathematics)
- . **Laplace transformation**
- transformations (mathematics)
- . integral transformations
- . . . **Laplace transformation**
- RT differential equations
- operators (mathematics)

## lapse rate

DEF The decrease of an atmospheric variable with height, the variable being temperature, unless otherwise specified. The term applies ambiguously to the environmental lapse rate and the process lapse rate, and the meaning must often be ascertained from the context.

- RT humidity
- temperature
- temperature inversions
- tephigrams

*LARA aircraft*

USE **COIN aircraft**

## large aperture seismic array

- GS arrays
  - . **large aperture seismic array**
- RT Earth movements
- earthquakes
- measuring instruments
- seismic waves
- seismology

## Large Area Crop Inventory Experiment

- RT agriculture
- agrophysical units
- crop growth
- crop inventories
- ∞ crops
- Earth resources
- Earth Resources Program
- farm crops
- inventories

## Large Deployable Reflector

- (added September 1988)*
- UF *LDR (telescope)*
- GS artificial satellites
  - . scientific satellites
  - . . . astronomical satellites
  - . . . . **Large Deployable Reflector**
  - observatories
  - . . . astronomical observatories
  - . . . astronomical satellites
  - . . . . **Large Deployable Reflector**
  - telescopes
  - . . . infrared telescopes
  - . . . **Large Deployable Reflector**
  - . reflecting telescopes
  - . . . **Large Deployable Reflector**
  - . spaceborne telescopes
  - . . . **Large Deployable Reflector**
- RT infrared astronomy
- large space structures
- reflectors
- space erectable structures
- submillimeter waves

## large eddy simulation

- (added October 1997)*
- UF *LES (mathematics)*
- GS simulation
  - . **large eddy simulation**
- RT atmospheric models
- computational fluid dynamics
- dynamic models
- eddy viscosity
- mathematical models
- Navier-Stokes equation
- Reynolds averaging
- turbulence models
- turbulent flow

- vortices
- Large Infrared Telescope on Spacelab*  
USE **LIRTS (telescope)**
- large scale integration**  
UF *LSI*  
GS circuits  
. integrated circuits  
. . **large scale integration**  
microelectronics  
. **large scale integration**  
RT application specific integrated circuits  
chips (electronics)  
DTL integrated circuits  
electronic packaging  
linear integrated circuits  
medium scale integration  
microminiaturization  
microprocessors  
molecular electronics  
printed circuits  
systems-on-a-chip  
TTL integrated circuits  
very large scale integration  
VHSIC (circuits)
- large space structures**  
RT Columbus space station  
continuum modeling  
expandable structures  
flexible spacecraft  
hoop column antennas  
Integrated Truss Structure P1  
Integrated Truss Structure S1  
International Space Station  
intraorbit transfer vehicles  
Large Deployable Reflector  
laser gyroscopes  
maypole antennas  
megamechanics  
orbital servicing  
orbital space tests  
self shadowing  
shape control  
smart structures  
solar power satellites  
space erectable structures  
Space Operations Center (NASA)  
Space Station Freedom  
space station structures  
space stations  
space technology experiments  
spacecraft structures  
∞ structures
- Large Space Telescope*  
USE **Hubble Space Telescope**
- large-scale structure of the universe**  
(added May 2002)  
DEF Distribution of matter in the universe at the largest scale including the distribution of galactic clusters and superclusters.  
UF *LSS (cosmology)*  
RT big bang cosmology  
cosmology  
dark matter  
galactic clusters  
galactic evolution  
missing mass (astrophysics)  
relic radiation  
string theory  
universe
- LARGOS satellite**  
GS artificial satellites  
. geodetic satellites  
. . **LARGOS satellite**  
RT Explorer 29 satellite  
Explorer 36 satellite  
GEOS 1 satellite  
GEOS 2 satellite  
GEOS 3 satellite
- Larissa**  
(added July 1995)  
DEF A natural satellite of Neptune, orbiting at a mean distance of 73,600 kilometers.  
GS celestial bodies  
. natural satellites  
. . Neptune satellites  
. . . **Larissa**  
RT Neptune (planet)
- Larmor precession**  
GS gyration  
. precession  
. . **Larmor precession**  
RT cyclotron frequency  
cyclotron radiation
- Larmor radius**  
DEF For a charged particle moving transversely in a uniform magnetic field, the radius of curvature of the projection of its path on a plane perpendicular to the field. Named after the English mathematician Sir Joseph Larmor (1857-1942).  
GS dimensions  
. radii  
. . **Larmor radius**  
geometry  
. Euclidean geometry  
. . radii  
. . . **Larmor radius**  
RT cyclotron radiation  
gyromagnetism  
plasma physics  
precession
- larvae**  
GS **larvae**  
. bollworms  
. silkworms  
RT animals  
arthropods  
infestation  
insects  
invertebrates  
pupa  
worms
- larynx**  
GS anatomy  
. respiratory system  
. . **larynx**  
. . . glottis  
. . . vocal cords  
RT cartilage
- laser ablation**  
(added February 1992)  
GS ablation  
. **laser ablation**  
utilization  
. laser applications  
. . **laser ablation**  
RT laser annealing  
laser beams  
laser damage  
laser drilling  
laser heating  
laser plasmas  
laser target interactions  
laser welding  
nanostructure growth
- laser altimeters**  
GS measuring instruments  
. distance measuring equipment  
. . altimeters  
. . . **laser altimeters**  
RT aircraft instruments  
altitude control  
Ice, Cloud and Land Elevation Satellite  
∞ instruments  
lasers  
optical radar  
satellite instruments  
spacecraft instruments
- laser anemometers**  
DEF Measuring instruments in which the wind being measured passes through two perpendicular light beams and the resulting change in velocity of one or both beams is measured.  
GS measuring instruments  
. anemometers  
. . **laser anemometers**  
RT flow velocity  
velocity measurement
- laser annealing**  
DEF Rapid heating of metals and/or alloys with the use of lasers.  
GS heat treatment  
. annealing  
. . **laser annealing**  
utilization  
. laser applications  
. . **laser annealing**  
RT heating  
laser ablation  
laser cutting  
lasers  
normalizing (heat treatment)  
recrystallization  
simulated annealing  
tempering
- laser applications**  
GS utilization  
. **laser applications**  
. . laser ablation  
. . laser annealing  
. . laser cooling  
. . laser cutting  
. . laser deposition  
. . . pulsed laser deposition  
. . laser drilling  
. . laser fusion  
. . laser guidance  
. . laser guide stars  
. . laser heating  
. . laser induced fluorescence  
. . laser interferometry  
. . laser machining  
. . laser microscopy  
. . laser power beaming  
. . laser propulsion  
. . laser spectroscopy  
. . . optogalvanic spectroscopy  
. . laser ranging  
. . laser weapons  
. . laser welding  
. . . satellite laser ranging  
RT airborne lasers  
data transmission  
hole burning  
laser-induced breakdown spectroscopy  
metal working  
optical data storage materials  
optical disks  
optical radar  
optical relay systems  
photoacoustic spectroscopy  
plasmadynamic lasers  
production engineering  
quantum electronics  
rapid ballistics identification  
spaceborne lasers  
speckle holography  
speckle interferometry  
technology utilization  
ultrashort pulsed lasers
- laser arrays**  
(added January 1991)  
DEF A group of laser emitters arranged to give a desired combined output.  
GS arrays  
. **laser arrays**  
RT coupled modes  
far fields  
laser beams  
laser modes  
laser outputs  
lasers  
linear arrays  
near fields  
optical coupling  
phased arrays  
semiconductor lasers  
stimulated emission devices



**laser beams**

surface emitting lasers

*laser beam defocusing*  
 USE **thermal blooming**

**laser beams**  
*(added September 1988)*  
 SN (LIMITED TO THE TRANSMISSION AND INTERACTIONS OF LASER RADIATION; FOR THE QUANTITATIVE AND QUALITATIVE CHARACTERISTICS OF THE RADIATION PRODUCED BY A LASER USE "LASER OUTPUTS")  
 UF *laser radiation*  
 GS beams (radiation)  
 . light beams  
 . . **laser beams**  
 coherent radiation  
 . coherent electromagnetic radiation  
 . . **laser beams**  
 electromagnetic radiation  
 . coherent electromagnetic radiation  
 . . **laser beams**  
 . light beams  
 . . **laser beams**  
 RT beam steering  
 beamforming  
 four-wave mixing  
 free-space optical communication  
 holographic optical elements  
 laser ablation  
 laser arrays  
 thermal lensing

**laser cavities**  
 UF *optical generators*  
 GS cavities  
 . **laser cavities**  
 RT amplifiers  
 laser stability  
 lasers  
 light amplifiers  
 ∞ optics  
 pulse generators  
 semiconductor lasers  
 solid state devices  
 solid state lasers  
 stimulated emission devices

*laser communication*  
 USE **optical communication**

**laser cooling**  
*(added March 1995)*  
 SN ((COOLING OF ATOMIC PARTICLES BY LASERS, NOT COOLING OF LASERS))  
 GS cooling  
 . **laser cooling**  
 utilization  
 . laser applications  
 . . **laser cooling**  
 RT atom optics  
 atomic energy levels  
 optical pumping  
 Penning effect  
 quenching (atomic physics)  
 trapped particles

**laser cutting**  
 DEF The cutting of material by means of lasers.  
 GS cutting  
 . **laser cutting**  
 utilization  
 . laser applications  
 . . **laser cutting**  
 RT blanking (cutting)  
 cutters  
 focusing  
 forming techniques  
 laser annealing  
 laser drilling  
 laser heating  
 laser machining  
 laser outputs  
 laser target interactions  
 machining  
 ∞ materials science  
 metal cutting  
 micromachining  
 splitting

thermal blooming

**laser damage**  
 GS damage  
 . radiation damage  
 . . **laser damage**  
 radiation effects  
 . radiation damage  
 . . **laser damage**  
 RT burns (injuries)  
 laser ablation  
 pulsed radiation  
 radiation hazards

**laser deposition**  
*(added December 1992)*  
 GS deposition  
 . **laser deposition**  
 . . pulsed laser deposition  
 utilization  
 . laser applications  
 . . **laser deposition**  
 . . . pulsed laser deposition  
 RT crystal growth  
 epitaxy  
 excimer lasers  
 laser heating  
 nanostructure growth  
 superconducting films  
 vapor deposition

*laser diodes*  
 USE **semiconductor lasers**

**laser doppler velocimeters**  
 GS measuring instruments  
 . **laser doppler velocimeters**  
 optical equipment  
 . **laser doppler velocimeters**  
 RT flow measurement  
 nonintrusive measurement  
 optical measuring instruments  
 particle image velocimetry  
 velocity measurement

**laser drilling**  
 GS drilling  
 . **laser drilling**  
 utilization  
 . laser applications  
 . . **laser drilling**  
 RT focusing  
 laser ablation  
 laser cutting  
 micromachining

**laser fusion**  
 GS utilization  
 . laser applications  
 . . **laser fusion**  
 RT aspheric optics  
 ∞ fusion  
 glass lasers  
 high power lasers  
 inertial fusion (reactor)  
 Nova Laser System  
 plasmas (physics)  
 Shiva laser system

*Laser Geodynamic Satellite*  
 USE **LAGEOS (satellite)**

**laser guidance**  
 DEF Guidance system for rockets or projectiles, utilizing a laser beam for a precise trajectory to a designated target.  
 GS guidance (motion)  
 . terminal guidance  
 . . **laser guidance**  
 utilization  
 . laser applications  
 . . **laser guidance**  
 RT computer programs  
 homing devices  
 impact prediction  
 laser guide stars  
 missile control

**laser guide stars**  
*(added November 1994)*

DEF Use of a laser to excite either Rayleigh backscattering or the mesospheric sodium layer to create artificial references for adaptive optics.  
 GS utilization  
 . laser applications  
 . . **laser guide stars**  
 RT adaptive optics  
 celestial reference systems  
 image processing  
 instrument compensation  
 laser guidance  
 reference stars  
 star trackers

**laser gyroscopes**  
 DEF Ring-laser angular rotation sensors for stabilizing and controlling large space structures, for space vehicle guidance, etc.  
 GS gyroscopes  
 . **laser gyroscopes**  
 RT large space structures  
 optical gyroscopes  
 Sagnac effect  
 ∞ sensors  
 spacecraft guidance  
 stabilization  
 Titan 4B launch vehicle

**laser heating**  
 GS heating  
 . **laser heating**  
 utilization  
 . laser applications  
 . . **laser heating**  
 RT heat sources  
 laser ablation  
 laser cutting  
 laser deposition  
 pulse heating  
 pulsed laser deposition  
 pulsed lasers  
 thermal blooming  
 YAG lasers

**laser induced fluorescence**  
 DEF Emission of electromagnetic radiation that is caused by the flow of laser radiation into the emitting body and which ceases abruptly with the excitation. Used for LIF (fluorescence).  
 UF *LIF (fluorescence)*  
 GS emission  
 . light emission  
 . . luminescence  
 . . . fluorescence  
 . . . **laser induced fluorescence**  
 utilization  
 . laser applications  
 . . **laser induced fluorescence**  
 RT electromagnetic absorption  
 excitation  
 extinction  
 irradiation  
 laser outputs  
 laser spectroscopy  
 Mossbauer effect  
 phosphors  
 photoionization  
 photoluminescence  
 plasma radiation

*Laser Interferometer Gravitational-Wave Observatory*  
*(added December 2000)*  
 USE **LIGO (observatory)**

*Laser Interferometer Space Antenna*  
*(added December 2000)*  
 USE **LISA (observatory)**

**laser interferometry**  
 DEF The design and use of interferometers in which a laser is the light source. The monochromaticity and brilliance of the laser light enables the differentiation between interfering beams of hundreds of meters, in contrast to a maximum of 20 centimeters for the classical interferometers.  
 GS interferometry  
 . **laser interferometry**  
 utilization

- . laser applications
- .. **laser interferometry**
- RT LIGO (observatory)
- LISA (observatory)
- Sagnac effect
- laser machining**
- (added June 1995)
- UF *laser micromachining*
- GS machining
- . **laser machining**
- utilization
- . laser applications
- .. **laser machining**
- RT laser cutting
- metal working
- laser materials**
- RT alexandrite
- fiber lasers
- gadolinium-gallium garnet
- maser materials
- ∞ materials
- metal vapor lasers
- quantum well lasers
- rhodamine
- sulfur hexafluoride
- xenon chloride lasers
- xenon fluoride lasers
- YAG lasers
- laser micromachining*
- USE **laser machining**
- laser microscopy**
- DEF The application of a laser microscope having a ceramic tube in which a metal vapor is formed at 1600 degrees C. Copper (or other metal atoms) are excited and amplify light so that, when used with a projection microscope, the object to be magnified is illuminated. The power of the emitted beam on the screen remains constant.
- GS microscopy
- . **laser microscopy**
- utilization
- . laser applications
- .. **laser microscopy**
- RT electro-optics
- light amplifiers
- metal vapor lasers
- microelectronics
- laser mode locking**
- GS locking
- . **laser mode locking**
- RT injection locking
- lasers
- optical coupling
- laser modes**
- GS modes
- . **laser modes**
- RT axial modes
- field mode theory
- helium-neon lasers
- laser arrays
- laser stability
- optical resonators
- TEA lasers
- waveguide lasers
- wavelengths
- laser outputs**
- SN (LIMITED TO THE QUANTITATIVE AND QUALITATIVE CHARACTERISTICS OF THE RADIATION PRODUCED BY A LASER; FOR THE TRANSMISSION AND INTERACTIONS OF LASER RADIATION USE 'LASER BEAMS')
- GS output
- . **laser outputs**
- RT atmospheric lasers
- ∞ coherence
- coherent light
- diffraction radiation
- distributed feedback lasers
- dye lasers
- excimer lasers
- frequency pulling
- gasdynamic lasers
- glass lasers
- helium-neon lasers
- high power lasers
- holographic interferometry
- laser arrays
- laser cutting
- laser induced fluorescence
- laser stability
- maser outputs
- Nova Laser System
- optical resonators
- optical waveguides
- phase matching
- photon beams
- picosecond pulses
- pulse duration
- quantum efficiency
- radiant flux density
- Shiva laser system
- speckle patterns
- thermal blooming
- tube lasers
- two-wavelength lasers
- ultraviolet lasers
- volumetric efficiency
- waveguide lasers
- wavelengths
- x ray lasers
- xenon chloride lasers
- xenon fluoride lasers
- YAG lasers
- laser plasma interactions**
- DEF The results of the actions of laser beams on electrically ducting fluids, such as plasmas or ionized gases.
- GS electromagnetic interactions
- . plasma-electromagnetic interaction
- .. **laser plasma interactions**
- plasma interactions
- . plasma-electromagnetic interaction
- .. **laser plasma interactions**
- RT backscattering
- electromagnetic coupling
- glass lasers
- ∞ interactions
- plasmas (physics)
- theta pinch
- laser plasmas**
- SN (EXCLUDES LASER OUTPUTS)
- GS particles
- . charged particles
- .. energetic particles
- ... plasmas (physics)
- .... **laser plasmas**
- . corpuscular radiation
- . energetic particles
- ... plasmas (physics)
- .... **laser plasmas**
- RT inertial fusion (reactor)
- laser ablation
- laser-induced breakdown
- spectroscopy
- lasers
- laser power beaming**
- (added November 1989)
- DEF Space-to-Earth power transmission utilizing a laser.
- UF *power transmission (lasers)*
- GS power beaming
- . **laser power beaming**
- utilization
- . laser applications
- .. **laser power beaming**
- RT energy conversion
- laser propulsion
- microwave power beaming
- microwave transmission
- satellite power transmission
- spacecraft power supplies
- laser propulsion**
- DEF The use of high power lasers for aircraft, rocket, or spacecraft propulsion by indirect conversion of laser heated propellants or working fluids to produce thrust; direct thrust generation with laser light pressure on the vehicle;
- direct conversion of laser energy into electricity for propulsion.
- GS propulsion
- . electric propulsion
- .. **laser propulsion**
- . low thrust propulsion
- . photonic propulsion
- ... **laser propulsion**
- . spacecraft propulsion
- . photonic propulsion
- ... **laser propulsion**
- utilization
- . laser applications
- .. **laser propulsion**
- RT aircraft engines
- hybrid propulsion
- laser power beaming
- optical pumping
- power beaming
- propulsion system configurations
- propulsive efficiency
- Rankine cycle
- rocket engines
- spacecraft propulsion
- thermodynamic cycles
- laser pumping**
- DEF The application of a laser beam of appropriate frequency to a laser medium so that absorption of the radiation increases the population of atoms or molecules in higher energy states.
- GS optical pumping
- . **laser pumping**
- RT fiber lasers
- lasers
- maser pumping
- ∞ pumping
- rare gas-halide lasers
- solar-pumped lasers
- stimulated emission devices
- wiggler magnets
- laser radar*
- USE **optical radar**
- laser radiation*
- USE **laser beams**
- laser range finders**
- GS measuring instruments
- . distance measuring equipment
- .. range finders
- ... optical range finders
- .... **laser range finders**
- . optical measuring instruments
- .. optical range finders
- ... **laser range finders**
- optical equipment
- . optical measuring instruments
- .. optical range finders
- ... **laser range finders**
- RT LAGEOS (satellite)
- laser ranging
- lunar rangefinding
- lunar retroreflectors
- navigation aids
- navigation instruments
- satellite laser ranging
- laser rangefinding*
- (added July 2001)
- USE **laser ranging**
- laser ranger/tracker**
- RT airborne lasers
- range finders
- rangefinding
- tracking (position)
- laser ranging**
- (added July 2001)
- DEF A technique for determining the distance to a target by measuring the absolute time-of-flight of a laser pulse traveling from a transmitter to a reflector on the target and back to a detector at the transmission site.
- UF *laser rangefinding*
- LLR (*ranging*)
- lunar laser ranging*

## laser spectrometers

- GS rangefinding
  - . **laser ranging**
  - .. satellite laser ranging
- utilization
  - . laser applications
  - .. **laser ranging**
  - ... satellite laser ranging
- RT laser range finders
  - lunar rangefinding
  - retroreflection
  - retroreflectors

*laser spark spectroscopy*  
(added June 2001)

- USE **laser-induced breakdown spectroscopy**

### laser spectrometers

- DEF Spectrometers that use a laser.
- GS measuring instruments
  - . spectrometers
  - .. **laser spectrometers**
- RT absorption spectra
  - infrared spectroscopy
  - laser spectroscopy

### laser spectroscopy

- DEF The use of lasers for spectroscopic analysis; particularly in Raman spectroscopy.
- GS spectroscopy
  - . optical emission spectroscopy
  - .. **laser spectroscopy**
  - ... optogalvanic spectroscopy
- utilization
  - . laser applications
  - .. **laser spectroscopy**
  - ... optogalvanic spectroscopy
- RT chemical analysis
  - laser induced fluorescence
  - laser spectrometers
  - laser-induced breakdown spectroscopy
  - photoacoustic spectroscopy
  - spectroscopic analysis
  - spectrum analysis

### laser stability

- DEF Characteristic of a laser beam free from oscillations.
- GS stability
  - . **laser stability**
- RT continuous wave lasers
  - frequency pulling
  - frequency stability
  - laser cavities
  - laser modes
  - laser outputs

### laser target designators

- DEF Laser equipment aboard spacecraft for identifying satellites, missiles, and objects in space.
- RT ∞ detectors
  - missile tracking
  - satellite tracking
  - target recognition
  - targets

### laser target interactions

- DEF Interactions where lasers are used to produce heating, fusion, or damage in targets.
- RT ∞ interactions
  - laser ablation
  - laser cutting
  - lasers
  - pulsed lasers
  - targets

### laser targets

- DEF Objects subjected to laser radiation, especially for laser fusion applications.
- GS targets
  - . **laser targets**
- RT glass lasers
  - lasers

### laser weapons

- DEF Military applications of high power lasers (mainly gasdynamic and chemical mixing lasers).

- GS utilization
  - . laser applications
  - .. **laser weapons**
  - weapon systems
    - . **laser weapons**
    - weapons
      - . **laser weapons**
- RT fusion weapons
  - lasers
  - military technology
  - space weapons
  - stimulated emission devices

### laser welding

- DEF Microspot welding with a laser beam.
- GS utilization
  - . laser applications
  - .. **laser welding**
  - welding
    - . fusion welding
    - .. **laser welding**
- RT bonding
  - heating
  - laser ablation
  - pulsed lasers
  - soldering

### laser windows

- GS windows (intervals)
  - . **laser windows**
- RT bandwidth
  - energy bands
  - lasers

### laser-induced breakdown spectroscopy

(added June 2001)

DEF A non-intrusive, spectroscopic technique wherein a laser pulse is focused on the target sample to form a laser spark or plasma. The emitted light from the spark is then used to identify elemental constituents and quantify abundances of measured species.

- UF *laser spark spectroscopy*
  - LASS (spectroscopy)*
  - LIBS (spectroscopy)*
- GS spectroscopy
  - . **laser-induced breakdown spectroscopy**
- RT absorption spectroscopy
  - emission spectra
  - laser applications
  - laser plasmas
  - laser spectroscopy
  - plasma diagnostics
  - Raman spectroscopy
  - spectroscopic analysis

### lasers

DEF Devices for producing light by emission of energy stored in a molecular or atomic system when stimulated by light or an electric discharge. (From Light Amplification by Stimulated Emission of Radiation.) Used for Fabry-Perot lasers, natural lasers, and optical masers.

- UF *Fabry-Perot lasers*
  - natural lasers*
  - optical masers*
- GS stimulated emission devices

#### . lasers

- .. airborne lasers
- .. argon lasers
- .. atmospheric lasers
- .. carbon lasers
- .. chemical lasers
- ... HCL lasers
- ... HCL argon lasers
- ... chemical oxygen-iodine lasers
- .. continuous wave lasers
- .. distributed feedback lasers
- .. free electron lasers
- .. gamma ray lasers
- .. gas lasers
- ... carbon dioxide lasers
- ... carbon monoxide lasers
- ... DF lasers
- ... excimer lasers
- ... HCL lasers
- ... HCL argon lasers
- ... HCN lasers
- ... helium-neon lasers

- ... HF lasers
  - ... nitrogen lasers
  - ... rare gas-halide lasers
  - ... krypton fluoride lasers
  - ... xenon chloride lasers
  - ... xenon fluoride lasers
  - ... TEA lasers
  - ... ultraviolet lasers
  - .. gasdynamic lasers
  - .. glass lasers
  - .. high power lasers
  - ... Nova Laser System
  - ... Shiva laser system
  - .. infrared lasers
  - .. injection lasers
  - ... quantum cascade lasers
  - .. iodine lasers
  - ... chemical oxygen-iodine lasers
  - .. liquid lasers
  - .. metal vapor lasers
  - .. neodymium lasers
  - .. nuclear pumped lasers
  - .. organic lasers
  - ... dye lasers
  - .. plasmadynamic lasers
  - .. pulsed lasers
  - ... Q switched lasers
  - ... ultrashort pulsed lasers
  - ... ultraviolet lasers
  - .. Raman lasers
  - .. ring lasers
  - .. semiconductor lasers
  - ... aluminum gallium arsenide lasers
  - ... gallium arsenide lasers
  - ... quantum cascade lasers
  - ... quantum well lasers
  - ... YLF lasers
  - .. solar-pumped lasers
  - .. solid state lasers
  - ... aluminum gallium arsenide lasers
  - ... DBR lasers
  - ... fiber lasers
  - ... gallium arsenide lasers
  - ... quantum cascade lasers
  - ... quantum well lasers
  - ... ruby lasers
  - ... YAG lasers
  - ... YLF lasers
  - .. spaceborne lasers
  - .. surface emitting lasers
  - .. tunable lasers
  - .. two-wavelength lasers
  - .. waveguide lasers
  - ... fiber lasers
  - .. x ray lasers
- RT alkali vapor lamps
- amplifiers
  - beam switching
  - ∞ coherence
  - coherent electromagnetic radiation
  - coherent light
  - electron pumping
  - gadolinium-gallium garnet
  - garnets
  - hole burning
  - holography
  - infrared windows
  - interplanetary communication
  - interstellar masers
  - Kerr electrooptical effect
  - laser altimeters
  - laser annealing
  - laser arrays
  - laser cavities
  - laser mode locking
  - laser plasmas
  - laser pumping
  - laser target interactions
  - laser targets
  - laser weapons
  - laser windows
  - lasing
  - light amplifiers
  - light modulation
  - light sources
  - light transmission
  - lunar communication
  - masers
  - microballoons

- molecular oscillators  
nuclear pumping  
optical communication  
optical data processing  
optical memory (data storage)  
optical pumping  
optical resonators
- ∞ optics  
phase matching  
photodiodes  
photonics  
pulse generators  
pulsed radiation  
quantum amplifiers  
quantum electronics  
rapid ballistics identification  
Senarmont polariscopes  
solid state devices  
space communication  
stimulated emission  
thermal blooming  
threshold currents  
transient oscillations  
traveling wave modulation
- lasing**  
DEF Generation of visible or IR light waves having very nearly a single frequency by pumping or exciting electrons into high energy states in a stimulated emission device (laser).  
RT distributed feedback lasers  
electron transitions  
excimer lasers  
hole burning  
krypton fluoride lasers  
lasers  
nitrogen lasers  
optical transition  
rare gas-halide lasers  
stimulated emission devices  
surface emitting lasers
- LASS (spectroscopy)*  
(added June 2001)  
USE **laser-induced breakdown spectroscopy**
- LASV*  
USE **F-111 aircraft**
- latches**  
DEF Devices that fasten one thing to another, as a rocket to a launcher, but are subject to ready release so that things may be separated.  
RT fasteners  
holders  
linkages  
pins
- latch-up**  
DEF A p-n-p-n self-sustaining low impedance state which is a type of electronic malfunction.  
RT CMOS  
electrical impedance  
integrated circuits  
p-n-p-n junctions  
switching circuits
- late stars**  
GS celestial bodies  
. stars  
. . **late stars**  
. . . cool stars  
. . . . carbon stars  
. . . . flare stars  
. . . . K stars  
. . . . M stars  
. . . . . Van Biesbroeck star  
. . . . . Mira variables  
. . . . . Omicron Ceti star  
. . . . . S stars  
RT asymptotic giant branch stars  
dwarf stars  
early stars  
giant stars  
main sequence stars  
red dwarf stars  
red giant stars
- stellar evolution  
subgiant stars
- lateness**  
RT delay  
scheduling
- latent heat**  
DEF The unit quantity of heat required for isothermal change in a state of a unit mass of matter. Latent heat is termed heat of fusion, heat of sublimation, heat of vaporization, depending on the change of state involved.  
GS chemical properties  
. thermochemical properties  
. . **latent heat**  
. . . heat of fusion  
. . . heat of vaporization  
heat  
. enthalpy  
. . **latent heat**  
. . . heat of fusion  
. . . heat of vaporization  
thermodynamic properties  
. enthalpy  
. . **latent heat**  
. . . heat of fusion  
. . . heat of vaporization  
. thermochemical properties  
. . **latent heat**  
. . . heat of fusion  
. . . heat of vaporization  
. thermophysical properties  
. . **latent heat**  
. . . heat of fusion  
. . . heat of vaporization
- latent heat of fusion*  
USE **heat of fusion**
- lateral control**  
UF *lateralization*  
*roll control*  
GS attitude control  
. **lateral control**  
RT ailerons  
aircraft control  
altitude control  
automatic control  
∞ control  
directional control  
elevons  
helicopter control  
longitudinal control  
manual control  
missile control  
roll  
satellite attitude control  
satellite control
- lateral oscillation**  
UF *snaking*  
RT directional stability  
roll  
stability augmentation  
transverse oscillation  
turning flight  
wing rock  
yaw  
yawing moments
- lateral stability**  
UF *dihedral effect*  
*lateral*  
GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . attitude stability  
. . . . **lateral stability**  
stability  
. dynamic stability  
. . motion stability  
. . . attitude stability  
. . . . **lateral stability**  
RT aerodynamic stability  
aircraft stability  
dihedral angle  
directional stability  
flow stability  
handedness
- hovering stability  
longitudinal stability  
roll  
rolling moments  
rotary stability  
spacecraft stability  
turning flight  
vertical orientation
- lateral*  
USE **lateral stability**
- lateralization*  
USE **lateral control**
- laterites**  
GS soils  
. **laterites**  
RT decomposition  
rocks  
tropical regions  
water
- latex**  
RT acrylic resins  
elastomers  
rubber  
synthetic rubbers
- lathes**  
GS tools  
. machine tools  
. . **lathes**  
. . . turret lathes  
RT ∞ construction materials  
grinding machines
- Latin square method**  
DEF In mathematics, the use of an n x n square array of n different symbols, each symbol appearing once in each row and once in each column.  
RT ∞ mathematics  
∞ methodology  
∞ variable
- latitude**  
DEF Angular distance from a primary great circle or plane.  
GS **latitude**  
. geomagnetic latitude  
RT coordinates  
geodetic coordinates  
longitude  
position (location)
- latitude measurement**  
RT longitude measurement  
∞ measurement  
navigation  
positioning
- lattice energy**  
(added March 2002)  
DEF A measure of the stability of a crystal lattice, given by the energy that would be released in bringing constituent ions from an infinite distance apart to their locations in a stable lattice.  
RT binding energy  
crystal lattices  
∞ energy  
interatomic forces  
ionic crystals  
lattice parameters  
lattice vibrations
- lattice imperfections*  
USE **crystal defects**
- lattice parameters**  
GS independent variables  
. **lattice parameters**  
RT crystal lattices  
crystallography  
lattice energy  
Patterson map  
superlattices

## lattice vibrations

x ray analysis

### lattice vibrations

GS vibration  
. **lattice vibrations**  
RT crystal defects  
crystal lattices  
forbidden bands  
lattice energy  
particle motion  
phonons  
random vibration  
spin-lattice relaxation  
thermal energy

### ∞ lattices

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT crystal lattices  
lattices (mathematics)

### lattices (mathematics)

UF *sublattices*  
GS mathematical logic  
. **lattices (mathematics)**  
. . Boolean algebra  
. . . Boolean functions  
RT communication theory  
Kakutani theorem  
∞ lattices  
∞ mathematics  
∞ matrices  
set theory  
vortex lattice method

### Latvia

GS nations  
. **Latvia**  
RT Baltic sea  
Europe

### Laue method

GS x ray analysis  
. **Laue method**  
RT crystal lattices  
crystallography  
diffraction  
∞ methodology  
x ray diffraction

### laughing

RT emotions  
human reactions

### launch clouds

USE **exhaust clouds**

### launch complexes

USE **launching bases**

### launch costs

(added December 1995)  
GS costs  
. **launch costs**  
RT cost reduction  
financial management  
launch vehicles  
spacecraft launching

### launch dates

RT launching  
spacecraft launching  
time  
turnaround (STS)

### launch escape systems

UF *LES (escape systems)*  
GS escape systems  
. **launch escape systems**  
RT escape capsules  
escape rockets  
∞ systems

### launch time

USE **launch windows**

### launch vehicle configurations

RT Advanced Launch System (STS)  
aerodynamic configurations  
∞ configurations

HOTOL launch vehicle  
missile configurations  
propulsion system configurations  
recoverable launch vehicles  
spacecraft configurations

### launch vehicles

DEF Rockets or other vehicles used to transport satellites, space probes, or other payloads from the Earth (or other terrestrial surfaces) to space.

UF *carrier rockets*

### GS launch vehicles

. Ablestar launch vehicle  
. Ariane launch vehicle  
. . Ariane 4 launch vehicle  
. . Ariane 5 launch vehicle  
. Atlas launch vehicles  
. . Atlas Able 5 launch vehicle  
. . Atlas Agena B launch vehicle  
. . Atlas Agena launch vehicles  
. . Atlas Centaur launch vehicle  
. . Atlas SLV-3 launch vehicle  
. Blue Scout rocket vehicle  
. Blue Streak launch vehicle  
. Centaur launch vehicle  
. . Atlas Centaur launch vehicle  
. Delta launch vehicle  
. . Delta 3 launch vehicle  
. . Delta 4 Heavy launch vehicle  
. . Delta 4 launch vehicle  
. Diamant launch vehicle  
. Eldo launch vehicle  
. Europa launch vehicles  
. . Europa 1 launch vehicle  
. . Europa 2 launch vehicle  
. . Europa 3 launch vehicle  
. . Europa 4 launch vehicle  
. heavy lift launch vehicles  
. . Ares 5 cargo launch vehicle  
. . Delta 4 Heavy launch vehicle  
. Energiya launch vehicle  
. . Proton launch vehicle  
. Hyla-Star rocket vehicle  
. Juno launch vehicles  
. . Juno 1 launch vehicle  
. . Juno 2 launch vehicle  
. Little Joe 2 launch vehicle  
. Nomad launch vehicle  
. Nova launch vehicles  
. Pegasus air-launched booster  
. RAM B launch vehicle  
. recoverable launch vehicles  
. reusable launch vehicles  
. . single stage to orbit vehicles  
. . . Delta Clipper  
. . . HOTOL launch vehicle  
. . X-33 reusable launch vehicle  
. . X-34 reusable launch vehicle  
. Saturn launch vehicles  
. . Saturn 1 launch vehicles  
. . . Saturn 1 SA-1 launch vehicle  
. . . Saturn 1 SA-10 launch vehicle  
. . . Saturn 1 SA-2 launch vehicle  
. . . Saturn 1 SA-3 launch vehicle  
. . . Saturn 1 SA-4 launch vehicle  
. . . Saturn 1 SA-5 launch vehicle  
. . . Saturn 1 SA-6 launch vehicle  
. . . Saturn 1 SA-7 launch vehicle  
. . . Saturn 1 SA-8 launch vehicle  
. . . Saturn 1 SA-9 launch vehicle  
. . Saturn 1B launch vehicles  
. . Saturn 2 launch vehicles  
. . Saturn 5 launch vehicles  
. . Saturn D launch vehicle  
. Scout launch vehicle  
. Standard Launch Vehicles  
. . Atlas SLV-3 launch vehicle  
. . Standard Launch Vehicle 5  
. Thor launch vehicles  
. . Thor Able rocket vehicle  
. . Thor Agena launch vehicle  
. . Thor Delta launch vehicle  
. Thorad launch vehicles  
. . Thor Able rocket vehicle  
. . Thor Agena launch vehicle  
. . Thor Delta launch vehicle  
. Titan Centaur launch vehicle  
. Titan launch vehicles

. . Titan 3 launch vehicle  
. . Titan 4 launch vehicle  
. . . Titan 4B launch vehicle  
. Ares 1 launch vehicle  
. Long March launch vehicles  
. vanguard 2 launch vehicle  
. Vega launch vehicle  
. Zenit launch vehicles  
. . Ares 1 first stage  
. . Ares 1 upper stage  
RT Advanced Launch System (STS)  
aerospace planes  
booster rocket engines  
∞ booster rockets  
∞ boosters  
Centaur project  
exhaust clouds  
flight test vehicles  
Jupiter C rocket vehicle  
Jupiter project  
landing modules  
launch costs  
launchers  
launching  
missile launchers  
missiles  
multiengine vehicles  
multistage rocket vehicles  
National Launch Vehicle Program  
rocket catapults  
rocket engines  
rocket launchers  
rocket launching  
rocket vehicles  
∞ rockets  
Saturn project  
Scout project  
Space Processing Applications  
Rocket  
∞ spacecraft  
spacecraft launching  
sustainer rocket engines  
test vehicles  
Titan project  
∞ vehicles  
Vernier engines  
∞ winged vehicles

### launch windows

DEF The postulated openings in the continuum of time or of space, through which a spacecraft or missile must be launched in order to achieve a desired encounter, rendezvous, impact or the like. Used for launch time.

UF *launch time*

GS windows (intervals)

. **launch windows**

RT launching  
rocket launching  
spacecraft launching

### launchers

DEF Specifically, structures or devices, often incorporating tubes, a group of tubes, or a set of tracks, from which self-propelled missiles are sent forth and by means of which the missiles usually are aimed or imparted initial guidance -- distinguished in this specific sense the catapult. Broadly, structures, machines, or devices, including catapults, by means of which airplanes, rockets, or the like are directed, hurled, or sent forth. Used for launching devices.

UF *launching devices*

### GS launchers

. aircraft launching devices  
. . JATO engines  
. catapults  
. . rocket catapults  
. gun launchers  
. hypervelocity launchers  
. missile launchers  
. . mobile missile launchers  
. rocket launchers  
. . rocket catapults  
RT launch vehicles  
launching  
launching pads  
launching sites  
mass drivers

- National Launch Vehicle Program  
rocket launching  
Titan project
- launching**
- GS **launching**  
. air launching  
. rocket launching  
. . . liftoff (launching)  
. . . lunar launch  
. . . orbital launching  
. sea launching  
. spacecraft launching  
. . . liftoff (launching)
- RT countdown  
exhaust clouds  
launch dates  
launch vehicles  
launch windows  
launchers  
missile launchers  
National Launch Vehicle Program  
prelaunch tests  
rocket launchers  
 $\infty$  shot  
starting  
Titan project
- launching bases**  
DEF Areas such as Cape Kennedy or Vandenberg Air Force Base that have several launch sites. Used for launch complexes.  
UF *launch complexes*  
GS **launching bases**  
. Cape Kennedy launch complex  
RT  $\infty$  facilities  
ground support equipment
- launching devices*  
USE **launchers**
- launching pads**  
DEF The load-bearing base or platform from which a rocket vehicle is launched.  
GS sites  
. launching sites  
. . . **launching pads**  
RT flame deflectors  
gantry cranes  
ground support equipment  
launchers  
liftoff (launching)  
 $\infty$  pad  
 $\infty$  platforms  
spacecraft launching  
umbilical towers
- launching sites**  
DEF Defined areas from which a rocket vehicle is launched, either, operationally or for test purposes; specifically, at Cape Kennedy or Vandenberg, any of the several areas equipped to launch a rocket.  
GS sites  
. **launching sites**  
. . . launching pads  
RT exhaust clouds  
gantry cranes  
ground support equipment  
launchers  
missile launchers  
missile silos  
missiles  
National Launch Vehicle Program  
rocket catapults  
rocket launchers
- lava**  
DEF A general term for a molten extrusive; also, for the rock that is solidified from it.  
GS effusives  
. **lava**  
geophysical fluids  
. **lava**  
RT aggregates  
calderas  
cones (volcanoes)  
Earth resources  
igneous rocks  
magma
- maria  
Mars volcanoes  
minerals  
regolith  
rhyolite  
rocks  
soils  
volcanic eruptions  
volcanoes  
volcanology
- Laval number**  
GS dimensionless numbers  
. **Laval number**  
ratios  
. **Laval number**
- Laves phases**  
(added August 1998)  
GS solid phases  
. **Laves phases**  
RT alloys  
crystal lattices  
crystal structure  
cubic lattices  
interstitials  
microstructure  
phase transformations
- $\infty$  **law**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT claiming  
law (jurisprudence)  
laws
- law (jurisprudence)**  
DEF A written rule or collection of rules for action or conduct binding upon the population of a community.  
UF *forensic sciences*  
*statutes*  
GS **law (jurisprudence)**  
. international law  
. . . air law  
. . . sea law  
. . . space law  
. public law  
. . . liabilities  
. . . legal liability  
. . . penalties  
RT constitution  
crime  
intellectual property  
 $\infty$  law  
politics  
regulations  
voting
- lawrencium**  
GS chemical elements  
. actinide series  
. . . transuranium elements  
. . . **lawrencium**  
. nuclides  
. . . isotopes  
. . . radioactive isotopes  
. . . . transuranium elements  
. . . . **lawrencium**  
metals  
. actinide series  
. . . transuranium elements  
. . . **lawrencium**
- laws**  
GS **laws**  
. Child-Langmuir law  
. closure law  
. Coffin-Manson law  
. conservation laws  
. Fourier law  
. Hookes law  
. Kepler laws  
. Newton pressure law  
. Newton second law  
. Newton-Busemann law  
. Ohms law  
. radiation laws  
. . . Kirchhoff law of radiation  
. . . Stefan-Boltzmann law
- . . . Stokes law of radiation  
. Biot-Savart law  
. scaling laws  
. similitude law  
. Snells law  
. Tafel law  
. Weber-Fechner law  
RT  $\infty$  law  
rules  
 $\infty$  Stokes law
- $\infty$  **layers**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *lamina*  
*plies*  
RT anticlines  
atmospheric boundary layer  
barrier layers  
boundary layers  
coatings  
deep scattering layers  
Earth ionosphere  
Ekman layer  
flat layers  
folds (geology)  
formations  
geosynclines  
intercalation  
interlayers  
laminates  
membranes  
mixing layers (fluids)  
monomolecular films  
multilayer insulation  
plasma layers  
ply orientation  
regions  
sedimentary rocks  
shear layers  
shock layers  
strata  
stratification  
substrates  
surface layers  
synclines  
three dimensional boundary layer  
turbulent boundary layer
- layouts**  
RT blueprints  
circuit diagrams  
construction  
descriptive geometry  
 $\infty$  design  
 $\infty$  drawing  
drawings  
engineering drawings  
models  
 $\infty$  plans  
surveys
- lay-up**  
DEF Production of reinforced plastics by positioning the reinforced material (such as glass) in the mold prior to impregnation with resin.  
RT aramid fibers  
carbon fiber reinforced plastics  
composite materials  
composite structures  
epoxy resins  
fiber orientation  
laminates  
reinforcing fibers  
stacking sequence (composite materials)
- Lazarev meteorite**  
GS celestial bodies  
. meteorites  
. . . iron meteorites  
. . . **Lazarev meteorite**  
RT stony meteorites
- LC circuits**  
GS circuits  
. **LC circuits**  
RT inductance

## LCROSS (satellite)

- network analysis
- network synthesis
- parametric amplifiers
- RC circuits
- RL circuits
- RLC circuits
- time constant

### LCRE Reactor

USE **Lithium Cooled Reactor Experiment**

### LCROSS (satellite)

(added December 2009)

DEF Robotic spacecraft and associated mission designed to confirm the presence or absence of water ice in a permanently shadowed crater near a lunar polar region. Launched June 18, 2009.

UF *Lunar Crater Observation and Sensing Satellite*

GS artificial satellites

- . lunar satellites
- . . **LCROSS (satellite)**
- . lunar spacecraft
- . lunar probes
- . . **LCROSS (satellite)**
- . lunar satellites
- . . **LCROSS (satellite)**
- . unmanned spacecraft
- . space probes
- . . lunar probes
- . . . **LCROSS (satellite)**

RT lunar craters

- . lunar exploration
- . Lunar Reconnaissance Orbiter
- . lunar resources
- . lunar surface

### LDEF

USE **Long Duration Exposure Facility**

### LDR (telescope)

USE **Large Deployable Reflector**

### leaching

RT autoclaving

- . beneficiation
- . dissolving
- . elution
- . extraction
- . flushing
- . hydrometallurgy
- . percolation
- . permeability
- . ∞ separation

### lead (metal)

GS chemical elements

- . **lead (metal)**
- . . lead isotopes
- . metals
- . **lead (metal)**
- . . lead isotopes

RT heavy metals

### lead acetates

GS acetates

- . **lead acetates**
- . esters
- . **lead acetates**
- . lead compounds
- . **lead acetates**
- . organic compounds
- . lead organic compounds
- . . **lead acetates**

### lead acid batteries

DEF The common automobile batteries in which the electrodes are grids of metallic lead containing lead oxides that change in composition during charging and discharging. The electrolyte generally is dilute sulfuric acid.

GS electrochemical cells

- . electric batteries
- . . storage batteries
- . . . **lead acid batteries**

RT chemical auxiliary power units

- . ∞ electric cells
- . electrolytic cells

- energy storage
- nickel iron batteries
- . ∞ power supplies

### lead alloys

GS alloys

- . **lead alloys**

RT bearing alloys

- . indium alloys
- . solders

### lead chlorides

GS halogen compounds

- . chlorine compounds
- . . chlorides
- . . . **lead chlorides**
- . halides
- . . chlorides
- . . . **lead chlorides**
- . . metal halides
- . . . **lead chlorides**
- . lead compounds
- . **lead chlorides**

### lead compounds

UF *plumbane*

GS **lead compounds**

- . lead acetates
- . lead chlorides
- . lead molybdates
- . lead oxides
- . lead selenides
- . lead sulfides
- . lead tellurides
- . lead titanates
- . . lead zirconate titanates
- . lead tungstates

RT ∞ chemical compounds

- . ∞ Group 4A compounds
- . ∞ metal compounds

### lead isotopes

GS chemical elements

- . lead (metal)
- . . **lead isotopes**
- . nuclides
- . . isotopes
- . . . **lead isotopes**
- . metals
- . lead (metal)
- . . **lead isotopes**

### lead molybdates

GS lead compounds

- . **lead molybdates**
- . molybdenum compounds
- . molybdates
- . . **lead molybdates**

### lead organic compounds

GS organic compounds

- . **lead organic compounds**
- . . lead acetates

RT ∞ chemical compounds

- . ∞ metal compounds

### lead oxides

GS chalcogenides

- . oxides
- . . metal oxides
- . . . **lead oxides**
- . lead compounds
- . **lead oxides**

### lead poisoning

GS diseases

- . toxic diseases
- . . **lead poisoning**
- . toxicity
- . **lead poisoning**

RT occupational diseases

- . ∞ poisoning
- . smog

### lead selenides

GS chalcogenides

- . selenides
- . . **lead selenides**
- . lead compounds
- . **lead selenides**

- selenium compounds
- . selenides
- . . **lead selenides**

### lead sulfides

GS chalcogenides

- . sulfides
- . . inorganic sulfides
- . . . **lead sulfides**
- . lead compounds
- . **lead sulfides**
- . sulfur compounds
- . sulfides
- . . inorganic sulfides
- . . . **lead sulfides**

### lead tellurides

GS chalcogenides

- . tellurides
- . . **lead tellurides**
- . lead compounds
- . **lead tellurides**
- . tellurium compounds
- . tellurides
- . . **lead tellurides**

### lead titanates

GS lead compounds

- . **lead titanates**
- . . lead zirconate titanates
- . titanium compounds
- . titanates
- . . **lead titanates**
- . . . lead zirconate titanates

### lead tungstates

GS lead compounds

- . **lead tungstates**
- . tungsten compounds
- . tungstates
- . . **lead tungstates**

### lead zirconate titanates

DEF Dense ceramics with high piezoelectric coefficients and a high relative permittivity.

GS ceramics

- . **lead zirconate titanates**
- . lead compounds
- . lead titanates
- . . **lead zirconate titanates**
- . titanium compounds
- . titanates
- . . lead titanates
- . . . **lead zirconate titanates**
- . zirconium titanates
- . . . **lead zirconate titanates**
- . zirconium compounds
- . zirconium titanates
- . . **lead zirconate titanates**

RT ferroelectric materials

- . piezoelectric ceramics

### leaders (meteorology)

(added August 1999)

GS electric current

- . electric discharges
- . lightning
- . . . **leaders (meteorology)**
- . . . stepped leaders

### leadership

RT morale

- . personnel management

### leading edge flaps

DEF Control surfaces at the leading edges of airfoils. Hinged panels deflected downward to induce and control separation of the air flow.

UF *Krueger flaps*

GS airfoils

- . flaps (control surfaces)
- . . wing flaps
- . . . **leading edge flaps**
- . brakes (for arresting motion)
- . aerodynamic brakes
- . wing flaps
- . . . **leading edge flaps**
- . aircraft brakes
- . wing flaps
- . . . **leading edge flaps**

- control surfaces
  - . flaps (control surfaces)
  - . . wing flaps
  - . . . **leading edge flaps**
- drag devices
  - . aerodynamic brakes
  - . . wing flaps
  - . . . **leading edge flaps**
- RT aircraft structures
  - vortex flaps
- ∞ winged vehicles
  - wings
- leading edge slats**
  - UF *wing slats*
  - GS airfoils
    - . flaps (control surfaces)
    - . . wing flaps
    - . . . **leading edge slats**
  - brakes (for arresting motion)
    - . aerodynamic brakes
    - . . wing flaps
    - . . . **leading edge slats**
  - . aircraft brakes
    - . . wing flaps
    - . . . **leading edge slats**
  - control surfaces
    - . flaps (control surfaces)
    - . . wing flaps
    - . . . **leading edge slats**
  - drag devices
    - . aerodynamic brakes
    - . . wing flaps
    - . . . **leading edge slats**
  - RT boundary layer control
    - split flaps
    - spoilers
    - trailing edge flaps
    - wing slots
- leading edge sweep**
  - GS geometry
    - . Euclidean geometry
    - . . angles (geometry)
    - . . . sweep angle
    - . . . . sweepback
    - . . . . . **leading edge sweep**
- leading edge thrust**
  - DEF The increase in lift produced by highly swept, low-aspect ratio wings which develop a strong separation vortex; however, an even larger increase in drag is produced.
  - GS thrust
    - . **leading edge thrust**
  - RT aerodynamic forces
    - airfoils
    - leading edges
    - lift
    - wing loading
- leading edges**
  - GS edges
    - . **leading edges**
    - . . blunt leading edges
    - . . sharp leading edges
  - RT airfoils
    - forebodies
    - leading edge thrust
    - thrust distribution
    - trailing edges
    - vortex flaps
    - wing rock
- leaf area index**
  - GS ratios
    - . indexes (ratios)
    - . . vegetative index
    - . . . **leaf area index**
  - RT canopies (vegetation)
    - crop identification
    - crop inventories
    - leaves
    - photosynthetically active radiation
    - remote sensing
    - spectral reflectance
- leakage**
  - RT brush seals
    - cavities
- cracks
  - defects
  - ∞ escape
- fluid flow
  - intrusion
- labyrinth seals
  - loss of coolant
- losses
  - permeability
  - pinholes
  - porosity
  - ∞ reduction
  - seepage
  - wastes
- Lear jet aircraft**
  - GS commercial aircraft
    - . **Lear jet aircraft**
    - jet aircraft
    - . **Lear jet aircraft**
  - RT ∞ aircraft
- learning**
  - GS **learning**
    - . astronaut training
    - . conditioning (learning)
    - . habituation (learning)
    - . maze learning
    - . transfer of training
  - RT achievement
    - aptitude
    - behavior
    - child device
    - deconditioning
    - education
    - educational resources
    - educational television
    - habits
    - instructors
    - knowledge
    - memory
    - motivation
    - reinforcement (psychology)
    - responses
    - retention (psychology)
    - students
    - teaching machines
    - textbooks
    - training analysis
    - training evaluation
    - universities
- learning curves**
  - RT asymptotic methods
    - ∞ curves
- learning machines*
  - USE **machine learning**
- learning theory**
  - RT child device
    - education
    - problem solving
    - ∞ theories
- leasing**
  - DEF Contracting for the use and possession of land, buildings, etc., for a specified time and fixed payments.
  - GS procurement
    - . **leasing**
  - RT contracts
    - land use
    - NASA programs
    - resources management
    - site selection
- least squares method**
  - DEF Any statistical procedure that involves minimizing the sum of squared differences.
  - GS analysis (mathematics)
    - . numerical analysis
    - . . approximation
    - . . . **least squares method**
  - RT backpropagation (artificial intelligence)
    - correlation
    - curve fitting
    - Gauss-Markov theorem
    - mean square values
    - ∞ methodology
- optimization
  - parameter identification
  - quality control
  - regression analysis
  - simultaneous equations
- leather**
  - RT clothing
    - collagens
    - shoes
    - skin (anatomy)
- leaves**
  - RT brown wave effect
    - canopies (vegetation)
    - deciduous trees
    - defoliant
    - defoliation
    - foliage
    - green wave effect
    - herbicides
    - leaf area index
    - plant physiology
    - plants (botany)
- Lebanon**
  - GS nations
    - . **Lebanon**
  - RT Asia
- Lebesgue theorem**
  - GS analysis (mathematics)
    - . real variables
    - . . measure and integration
    - . . . **Lebesgue theorem**
  - theorems
    - . **Lebesgue theorem**
  - RT set theory
- lectures**
  - UF *speeches*
  - RT education
    - public speaking
    - speech
    - verbal communication
- LED (diodes)*
  - USE **light emitting diodes**
- Leda**
  - (added January 1996)
  - DEF A natural satellite of Jupiter orbiting at a mean distance of 11,094,000 kilometers.
  - GS celestial bodies
    - . natural satellites
    - . . Jupiter satellites
    - . . . **Leda**
  - RT Jupiter (planet)
- ledges**
  - RT cliffs
    - rocks
    - topography
- lee waves**
  - DEF Internal waves occurring on the downstream sides of submarine ridges.
  - RT air currents
    - barotropic flow
    - surface waves
    - tropospheric waves
    - vertical air currents
- leg (anatomy)**
  - GS anatomy
    - . limbs (anatomy)
    - . . **leg (anatomy)**
    - . . . feet (anatomy)
    - . . . knee (anatomy)
    - . . . thigh
    - appendages
    - . **leg (anatomy)**
    - . . feet (anatomy)
    - . . knee (anatomy)
    - . . thigh
  - RT femur
    - gait
    - tibia
- legal liability**
  - GS law (jurisprudence)



## Legendre functions

- . public law
- . . liabilities
- . . . **legal liability**
- RT air law
- contracts
- insurance (contracts)
- intellectual property
- international law
- judgments
- losses
- penalties
- prohibition

### Legendre code

USE **computer programming**  
**neutron scattering**

### Legendre functions

UF *Legendre polynomials*  
*Legendre transformation*

GS analysis (mathematics)  
. complex variables  
. . **Legendre functions**  
functions (mathematics)  
. **Legendre functions**

RT orthogonal functions  
spherical harmonics

### Legendre polynomials

USE **Legendre functions**

### Legendre transformation

USE **Legendre functions**

### legibility

RT character recognition  
contrast  
perception  
printing  
reading  
resolution  
symbols  
visibility  
vision

### leguminous plants

GS farm crops  
. **leguminous plants**  
. . soybeans  
plants (botany)  
. **leguminous plants**  
. . soybeans

RT agriculture  
botany  
Earth resources

∞ food  
hay  
nitrogenation  
nodules  
vegetables

### Leidenfrost phenomenon

GS phase transformations  
. vaporizing  
. . boiling  
. . . nucleate boiling  
. . . **Leidenfrost phenomenon**

RT film boiling  
heat transfer

### LEM (lunar module)

USE **Lunar Module**

### lemmas

USE **theorems**

### length

DEF The larger of the two dimensions of the open face.

GS dimensions  
. **length**  
. . diffusion length

RT distance  
thickness

### Lennard-Jones gas

RT binary fluids  
gas viscosity

Lennard-Jones potential

### Lennard-Jones potential

RT computerized simulation  
intermolecular forces  
Lennard-Jones gas  
molecular interactions  
potential theory

### lens antennas

GS antennas  
. directional antennas  
. . **lens antennas**  
. radio antennas  
. . microwave antennas  
. . . **lens antennas**  
microwave equipment  
. microwave antennas  
. . **lens antennas**  
radio equipment  
. radio antennas  
. . microwave antennas  
. . . **lens antennas**

RT antenna design  
dipole antennas  
horn antennas  
lenses  
multibeam antennas  
radar antennas  
waveguide antennas  
wire grid lenses

### lens design

RT antireflection coatings  
aspheric optics  
computer aided design

∞ design  
gradient index optics  
lenses  
optical correction procedure

∞ optics  
product development  
stigmatism  
zoom lenses

### lenses

DEF Transparent optical elements, so constructed that they serve to change the degree of convergence of the transmitted rays.

GS **lenses**  
. aspheric optics  
. contact lenses  
. Fresnel lenses  
. gravitational lenses  
. magnetic lenses  
. wide angle lenses  
. wire grid lenses  
. zoom lenses

RT astigmatism  
cameras  
cataracts  
circumsolar telescopes  
eye (anatomy)  
eyepieces  
focusing  
gradient index optics  
integrated optics  
lens antennas  
lens design  
magnification  
numerical aperture  
optical coatings  
optical equipment  
optical filters  
optical materials

∞ optics  
panoramic cameras  
photographic equipment  
refracting telescopes  
refraction  
reticles  
stigmatism  
streak cameras  
telescopes  
vignetting

### lenticular bodies

GS symmetrical bodies  
. **lenticular bodies**

RT axisymmetric bodies

∞ bodies  
convexity

### LEO

USE **low Earth orbits**

### LEO environments

USE **Earth orbital environments**

### Leonardo Logistics Module (ISS)

(added April 2005)  
USE **Multi-Purpose Logistics Modules**

### Leonid meteoroids

GS celestial bodies  
. meteoroid showers  
. . **Leonid meteoroids**  
meteoroids  
. . **Leonid meteoroids**

### leptons

DEF In the classification of subatomic particles according to mass, the lightest of all particles; examples of leptons are the electron and positron.

GS particles  
. elementary particles  
. . fermions  
. . . **leptons**  
. . . . antineutrinos  
. . . . electrons  
. . . . . conduction electrons  
. . . . . free electrons  
. . . . . high energy electrons  
. . . . . . relativistic electron beams  
. . . . . hot electrons  
. . . . . N electrons  
. . . . . negatrons  
. . . . . photoelectrons  
. . . . . pi-electrons  
. . . . . polarons  
. . . . . solar electrons  
. . . . . muons  
. . . . . neutrinos  
. . . . . solar neutrinos  
. . . . . positrons

RT charged particles  
charm (particle physics)  
gluons  
mesons  
partons  
quantum chromodynamics  
quark parton model

### LES (escape systems)

USE **launch escape systems**

### LES (mathematics)

(added October 1997)  
USE **large eddy simulation**

### LES (satellites)

USE **Lincoln Experimental Satellites**

### LESA (lunar exploration system)

USE **Lunar Exploration System for Apollo**

### lesions

GS injuries  
. **lesions**  
. . pulmonary lesions

RT abrasion  
burns (injuries)

### Lesotho

GS nations  
. **Lesotho**

RT Africa  
Republic of South Africa

### Lesser Antilles

GS landforms  
. islands  
. . West Indies  
. . . **Lesser Antilles**

RT Atlantic Ocean

### lessons learned

(added March 2008)  
DEF Knowledge or understanding gained

by experience. The lesson must be significant in that it has real or assumed impact on operations; valid in that it is factually and technically correct; and applicable in that it identifies a specific design, process, or decision that reduces or eliminates the potential for failures and mishaps, or reinforces a positive result.

- GS knowledge
  - . **lessons learned**
- RT accident investigation
  - accident prevention
  - accidents
  - documentation
  - experience
  - failure analysis
  - mission planning
  - quality control
  - reliability engineering

**lethality**

- RT carbon monoxide poisoning
  - damage
  - destruction

**lethargy**

- RT boredom
  - ∞ depression
  - detachment
  - frustration
  - human behavior
- ∞ inhibition
  - monotony

*letters (symbols)*

USE **symbols**

**leucine**

- GS acids
  - . amino acids
  - . . . **leucine**
  - . . . norleucine
- organic compounds
  - . amino acids
  - . . **leucine**
  - . . . norleucine

**leukemias**

- GS diseases
  - . tumors
  - . . neoplasms
  - . . . cancer
  - . . . . **leukemias**
- RT bone marrow
  - occupational diseases

**leukocytes**

- UF *white blood cells*
- GS cells (biology)
  - . blood cells
  - . . **leukocytes**
  - . . . eosinophils
  - . . . lymphocytes
  - . . . monocytes
  - . . . neutrophils
- RT biocompatibility
  - blood cell count
  - bone marrow
  - erythrocytes
  - immune systems
  - interleukins

**leukopenia**

- GS signs and symptoms
  - . **leukopenia**
- RT infectious diseases

∞ **level**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT chemical energy
  - free energy
  - height
  - internal energy
  - level (horizontal)
  - level (quantity)

**level (horizontal)**

- GS **level (horizontal)**
  - . liquid levels
- RT ∞ grade

gradients

∞ level

slopes

**level (quantity)**

- GS **level (quantity)**
  - . effective perceived noise levels
  - . energy levels
  - . . atomic energy levels
  - . . electron states
  - . . ground state
  - . . molecular energy levels
  - . . . intermolecular forces
  - . . . rotational states
  - . . . vibrational states
  - . . yrast state
- RT amplitudes
  - displacement
- ∞ flux
  - flux (rate)
  - flux density
- ∞ intensity
- ∞ level
  - loudness
  - magnitude
  - value

**leveling**

- SN (EXCLUDES METAL WORKING)
- RT adjusting
  - consistency
  - datum (elevation)
  - flattening
  - metal working
- ∞ rolling
  - smoothing
  - winding

**levers**

- RT cantilever members
  - handles
  - knobs
- ∞ machinery
  - manual control
  - mechanical devices
  - pedals

**levitation**

- GS **levitation**
  - . acoustic levitation
- RT buoyancy
  - electrostatic gyroscopes
  - flotation
  - frictionless environments
  - levitation melting
  - magnetic bearings
  - magnetic levitation vehicles
  - suspension systems (vehicles)
  - vacuum melting

**levitation melting**

DEF A metallurgical process in which a piece of metal placed above a coil carrying a high frequency current can be supported against gravity by the Lorentz force caused by the induced surface currents in the metal. At the same time, the heat produced by Joule dissipation melts the metal.

- GS phase transformations
  - . melting
  - . . **levitation melting**
- RT electric current
  - external surface currents
  - levitation
  - liquid metals
  - low gravity manufacturing
  - magnetic suspension
- ∞ metallurgy
  - ohmic dissipation
  - resistance heating
  - space manufacturing
  - space processing

**Lewis base**

- RT amines
  - electrons

**Lewis numbers**

- GS dimensionless numbers
  - . **Lewis numbers**

ratios

- . **Lewis numbers**
- RT density (mass/volume)
  - diffusion coefficient
  - fluid flow
  - heat transfer
  - mass flow
  - mass transfer
  - specific heat
  - thermal conductivity

**Lexan (trademark)**

- GS carbon compounds
  - . carbonates
  - . . polycarbonates
  - . . . **Lexan (trademark)**
- esters
  - . polycarbonates
  - . . **Lexan (trademark)**
- RT ∞ polymers
  - resins

*LFA thrusters*

(added April 2001)

USE **magnetoplasmadynamic thrusters**

*LFO*

USE **Landsat follow-on missions**

**liabilities**

- GS law (jurisprudence)
  - . public law
  - . . **liabilities**
  - . . . legal liability
- RT air law
  - commerce
  - disciplining
  - losses
  - penalties
  - regulations

**Liapunov functions**

- UF *Lyapunov functions*
- GS analysis (mathematics)
  - . real variables
  - . . **Liapunov functions**
  - . . . functions (mathematics)
  - . **Liapunov functions**
- RT differential equations

**Liberia**

- GS nations
  - . **Liberia**
- RT Africa

**libraries**

- RT bibliographies
  - catalogs (publications)
  - data retrieval
  - documentation
  - documents
  - information dissemination
  - information resources management
  - information retrieval
  - information systems
  - integrated library systems
  - interservice data exchange program
  - literature
  - museums
- ∞ reference systems
  - selective dissemination of information
  - textbooks
  - world data centers

**libration**

DEF A real or apparent oscillatory motion, particularly the apparent oscillation of the moon. Because of libration more than half of the moon's surface is revealed to an observer on the Earth even though the same side of the moon is always toward the Earth, because the moon's periods of rotation and revolution are the same. Other motions regarded as librations are long period orbital motions and periodic perturbations in orbital elements.

- RT Earth limb
  - Lissajous figures
  - lunar far side
  - lunar limb
- ∞ motion

## librational motion

nutaton  
orbital resonances (celestial mechanics)  
precession  
rotation

### librational motion

RT Lagrange coordinates  
∞ motion  
nutaton  
orbital resonances (celestial mechanics)

*LIFS (spectroscopy)*

(added June 2001)

USE **laser-induced breakdown spectroscopy**

### Libya

UF *Lybia*  
GS nations  
. **Libya**  
RT Africa

### Libyan desert

GS land  
. deserts  
. . **Libyan desert**  
RT Africa

### licensing

GS **licensing**  
. open source licensing (computers)  
RT copyrights  
intellectual property  
patent applications  
policies  
regulations

### lichens

GS plants (botany)  
. **lichens**  
RT algae  
fungi  
lacunas  
symbiosis

*lidar*

USE **optical radar**

### lie groups

GS algebra  
. **lie groups**  
. . spinor groups  
geometry  
. differential geometry  
. . **lie groups**  
. . . spinor groups  
RT group theory  
supergravity  
supersymmetry

### Liechtenstein

GS nations  
. **Liechtenstein**  
RT Europe

### Lienard potential

GS potential energy  
. electric potential  
. . **Lienard potential**  
RT electric current  
electric fields

### lies

RT galvanic skin response  
mental performance

*LIF (fluorescence)*

USE **laser induced fluorescence**

*life (biology)*

USE **life sciences**

### life (durability)

UF *lifetime (durability)*  
GS **life (durability)**  
. carrier lifetime  
. fatigue life  
. half life  
. plasma lifetime

. satellite lifetime  
. service life  
. storage stability

RT accelerated life tests  
aircraft survivability  
depletion  
depreciation  
durability  
failure analysis  
long term effects  
∞ longevity  
Mills ratio  
MTBF  
∞ resistance  
retirement for cause  
systems health monitoring  
vulnerability

### life cycle costs

DEF The sum of the acquisition costs and maintenance costs for the life of a system.

GS costs  
. **life cycle costs**  
RT concurrent engineering  
cost analysis  
cost effectiveness  
design to cost  
financial management  
management planning  
production costs  
systems engineering  
value engineering

### life detectors

RT biomarkers  
biosatellites  
∞ detectors  
extraterrestrial life

### life rafts

GS rafts  
. **life rafts**  
RT floats  
inflatable structures  
lifeboats

### life sciences

DEF A collective discipline encompassing biology, physiology, psychology, medicine, and sometimes sociology and other related areas.

Used for life (biology).

UF *life (biology)*  
GS **life sciences**  
. extraterrestrial life  
. molecular biology  
RT abiogenesis  
aging (biology)  
biological evolution  
∞ biology  
chemical evolution  
environmental engineering  
neurology  
∞ physical sciences  
psychopharmacology  
∞ science

### life span

SN (LIMITED TO THE LIFE SCIENCES)  
RT age factor  
aging (biology)  
death  
existence  
gerontology  
∞ longevity  
mortality  
∞ span

### life support systems

GS support systems  
. **life support systems**  
. . biopaks  
. . closed ecological systems  
. . emergency life sustaining systems  
. . . AEPS  
. . portable life support systems  
. . . AEPS  
. . . IMLSS  
RT aerospace environments  
air conditioning  
artificial gravity

astronaut locomotion  
∞ atmospheres  
biosatellites  
breathing apparatus  
Chlorella  
environmental engineering  
environments  
exobiology  
extravehicular mobility units  
human factors engineering  
long term effects  
lunar environment  
lunar logistics  
lunar shelters  
manned maneuvering units  
∞ nutrients  
onboard equipment  
oxygen masks  
oxygen supply equipment  
planetary environments  
pressure suits  
pressurized cabins  
provisioning  
rebreathing  
Service Module (ISS)  
space flight feeding  
space habitats  
spacecraft environments  
survival  
∞ sustaining  
∞ systems  
thermal environments  
underwater breathing apparatus  
vapor barrier clothing  
ventilation  
waste management  
water  
weightlessness

### lifeboats

GS surface vehicles  
. boats  
. . **lifeboats**  
water vehicles  
. boats  
. . **lifeboats**  
RT Assured Crew Return Vehicle  
life rafts  
rafts  
survival equipment  
X-38 crew return vehicle

*lifetime (durability)*

USE **life (durability)**

### lift

DEF That component of the total aerodynamic force acting on a body perpendicular to the undisturbed airflow relative to the body. To lift off, to take off in vertical ascent. Said of rocket vehicles. Used for aerodynamic lift, lift coefficients, lift distribution, lift forces, and variable lift.

UF *aerodynamic lift*  
*lift coefficients*  
*lift distribution*  
*lift forces*  
*variable lift*

GS aerodynamic characteristics  
. **lift**  
. . interference lift  
. . jet lift  
. . rotor lift  
. . zero lift  
aerodynamic forces  
. **lift**  
. . interference lift  
. . jet lift  
. . rotor lift  
. . zero lift  
dynamic characteristics  
. **lift**  
. . interference lift  
. . jet lift  
. . rotor lift  
. . zero lift  
RT aerodynamic coefficients  
aerodynamic configurations  
aerodynamic drag  
aerodynamics  
airfoils

- angle of attack  
 aspect ratio  
 camber  
 distribution (property)  
 drag  
 externally blown flaps  
 gliding  
 ground effect (aerodynamics)  
 hypersonic forces  
 leading edge thrust  
 pressure distribution  
 sweep effect  
 under surface blowing  
 upper surface blowing
- lift augmentation**  
 RT boundary layer control  
 circulation control airfoils  
 downwash  
 peripheral jet flow  
 spanwise blowing  
 STOVL aircraft  
 tangential blowing  
 upper surface blown flaps  
 vortex flaps
- lift coefficients*  
 USE **aerodynamic coefficients**  
**lift**
- lift devices**  
 UF *lifting surfaces*  
 RT boundary layer control  
 ∞ devices  
 direct lift controls  
 drag devices  
 externally blown flaps  
 flaps (control surfaces)  
 magnetic levitation vehicles  
 slots  
 upper surface blown flaps
- lift distribution*  
 USE **force distribution**  
**lift**
- lift drag ratio**  
 DEF The ratio of lift to drag obtained by dividing the lift by the drag or the lift coefficient by the drag coefficient. Used for drag balance.  
 UF *drag balance*  
 GS ratios  
 . **lift drag ratio**  
 RT aerodynamic balance  
 aerodynamic coefficients  
 aerodynamic drag  
 aerodynamic stalling  
 boundary layer separation  
 drag reduction  
 force distribution  
 pressure ratio
- lift fans**  
 UF *fanlift devices*  
 RT ducted fans  
 fan in wing aircraft  
 lifting rotors  
 propeller fans  
 rotary wings  
 short takeoff aircraft  
 turbofans  
 vertical takeoff aircraft  
 XV-11A aircraft
- lift forces*  
 USE **lift**
- lifting bodies**  
 UF *lifting surfaces*  
 GS **lifting bodies**  
 . lifting reentry vehicles  
 . . FDL-5 reentry vehicle  
 . . HL-10 reentry vehicle  
 . . HLD-35 reentry vehicle  
 . . Janus spacecraft  
 . . M-2 lifting body  
 . . . M-2F2 lifting body  
 . . X-20 aircraft  
 . . X-24 aircraft  
 . M-2F3 lifting body
- RT aerodynamic configurations  
 airfoils  
 bluff bodies  
 ∞ bodies  
 ∞ devices  
 lunar flying vehicles  
 reentry vehicles  
 towed bodies  
 waveriders
- lifting reentry vehicles**  
 UF *reentry gliders*  
*space gliders*  
 GS lifting bodies  
 . **lifting reentry vehicles**  
 . . FDL-5 reentry vehicle  
 . . HL-10 reentry vehicle  
 . . HLD-35 reentry vehicle  
 . . Janus spacecraft  
 . . M-2 lifting body  
 . . . M-2F2 lifting body  
 . . X-20 aircraft  
 . . X-24 aircraft  
 reentry vehicles  
 . maneuverable reentry bodies  
 . . **lifting reentry vehicles**  
 . . . FDL-5 reentry vehicle  
 . . . HL-10 reentry vehicle  
 . . . HLD-35 reentry vehicle  
 . . . Janus spacecraft  
 . . . M-2 lifting body  
 . . . . M-2F2 lifting body  
 . . . X-20 aircraft  
 . . . X-24 aircraft
- RT aerospace planes  
 ∞ aircraft  
 ASSET gliders  
 Astro vehicle  
 boostglide vehicles  
 gliders  
 HOPE aerospace plane  
 hypersonic gliders  
 manned reentry  
 manned spacecraft  
 recoverable spacecraft  
 reentry  
 spacecraft reentry
- lifting rotors**  
 GS airfoils  
 . wings  
 . . rotary wings  
 . . . **lifting rotors**  
 . . . . bearingless rotors  
 rotating bodies  
 . rotors  
 . . rotary wings  
 . . . **lifting rotors**  
 . . . . bearingless rotors
- RT ground effect machines  
 lift fans  
 rotary wing aircraft  
 short takeoff aircraft  
 vertical takeoff aircraft
- lifting surfaces*  
 USE **lift devices**  
**lifting bodies**  
**surfaces**
- liftoff (launching)**  
 GS launching  
 . rocket launching  
 . . **liftoff (launching)**  
 . spacecraft launching  
 . . **liftoff (launching)**
- RT booster rocket engines  
 countdown  
 launching pads  
 rocket firing  
 rocket thrust
- ∞ **lifts**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT conveyors  
 cranes  
 elevators (lifts)  
 escalators
- jacks (lifts)  
 winches
- ligaments**  
 RT connective tissue  
 joints (anatomy)
- ligands**  
 RT chemical bonds  
 chemical composition  
 coordination number
- light (visible radiation)**  
 DEF Visible radiation (about 0.4 to 0.7 microns in wavelength) considered in terms of its luminous efficiency, i.e., evaluated in proportion to its ability to stimulate the sense of sight. Used for optical spectrum and visible radiation.  
 UF *optical spectrum*  
*visible radiation*  
 GS electromagnetic radiation  
 . **light (visible radiation)**  
 . . coherent light  
 . . gegenschein  
 . . polarized light  
 . . sky radiation  
 . . . airglow  
 . . . . geocoronal emissions  
 . . . . nightglow  
 . . . . twilight glow  
 . . . dayglow  
 . . . elves  
 . . . sprites (atmospheric physics)  
 . . sunlight  
 . . zodiacal light
- RT atmospheric radiation  
 attenuation  
 beams (radiation)  
 black body radiation  
 brightness  
 Cerenkov radiation  
 coherent electromagnetic radiation  
 coherent radiation  
 color  
 critical frequencies  
 darkness  
 dichroism  
 electromagnetic spectra  
 energy absorption  
 excitons  
 extraterrestrial radiation  
 ∞ flash  
 geometrical optics  
 glare  
 illuminance  
 incandescence  
 infrared radiation  
 light curve  
 lighting equipment  
 line spectra  
 lumens  
 luminaires  
 luminance  
 luminescence  
 luminosity  
 luminous intensity  
 monochromatic radiation  
 near infrared radiation  
 near ultraviolet radiation  
 opacity  
 optical depolarization  
 optical emission spectroscopy  
 optical measurement  
 optical properties  
 ∞ optics  
 photics  
 photometry  
 photons  
 photonuclear reactions  
 photoperiod  
 photophilic plants  
 photophoresis  
 photosensitivity  
 planetary radiation  
 polarized electromagnetic radiation  
 polarizers  
 ∞ radiation  
 Raman spectra  
 reflection  
 refraction

## light adaptation

refractivity  
shadows  
sky brightness  
solar radiation  
thermal radiation  
transmittance  
ultraviolet spectra  
visibility  
visible spectrum

*light absorption*

USE **electromagnetic absorption**

### light adaptation

GS adaptation  
. retinal adaptation  
. . **light adaptation**  
sensitivity  
. photosensitivity  
. . **light adaptation**  
RT flash blindness  
night vision  
pupillometry  
thresholds (perception)  
vision

### Light Airborne Multipurpose System

UF *LAMPS program*  
GS navigation aids  
. **Light Airborne Multipurpose System**  
onboard equipment  
. airborne equipment  
. . **Light Airborne Multipurpose System**  
RT aircraft equipment  
flight instruments  
navigation instruments  
∞ systems

### light aircraft

GS **light aircraft**  
. Beech 99 aircraft  
. . Beechcraft 18 aircraft  
. . C-33 aircraft  
. . C-35 aircraft  
. Cessna 172 aircraft  
. Cessna 205 aircraft  
. Cessna 210 aircraft  
. Cessna 402B aircraft  
. Cessna L-19 aircraft  
. DH 125 aircraft  
. DO-27 aircraft  
. DO-28 aircraft  
. F-28 helicopter  
. Firebee 2 target drone aircraft  
. G-1 aircraft  
. light helicopters  
. . OH-4 helicopter  
. . OH-5 helicopter  
. . OH-6 helicopter  
. . OH-58 helicopter  
. light intratheater transport  
. MH-262 aircraft  
. Mystere 20 aircraft  
. OH-13 helicopter  
. OH-23 helicopter  
. PD-808 aircraft  
. Piper aircraft  
. . PA-34 Seneca aircraft  
. Saab 105 aircraft  
. SC-7 aircraft  
. U-10 aircraft  
. VZ-8 aircraft  
RT agricultural aircraft  
∞ aircraft  
biplanes  
drone aircraft  
general aviation aircraft  
∞ low wing aircraft  
∞ military aircraft  
observation aircraft  
passenger aircraft  
pilotless aircraft  
reconnaissance aircraft  
submersible aircraft  
∞ subsonic aircraft  
training aircraft  
transport aircraft  
ultralight aircraft

utility aircraft  
water takeoff and landing aircraft

### light alloys

GS alloys  
. **light alloys**  
. . aluminum alloys  
. . . aluminum-lithium alloys  
. . beryllium alloys  
. . magnesium alloys  
RT ∞ metallurgy  
metals

### light amplifiers

UF *optical amplifiers*  
GS amplifiers  
. **light amplifiers**  
RT fiber lasers  
four-wave mixing  
HCN lasers  
image converters  
image enhancement  
image intensifiers  
Lallemand cameras  
laser cavities  
laser microscopy  
lasers  
microchannels  
∞ optics  
photocathodes  
quantum amplifiers  
ultrashort pulsed lasers  
ultraviolet lasers

*light armed reconnaissance aircraft*

USE **COIN aircraft**

### light beams

UF *light probes*  
GS beams (radiation)  
. **light beams**  
. . laser beams  
electromagnetic radiation  
. **light beams**  
. . laser beams  
RT Bragg cells  
four-wave mixing  
optical waveguides  
photon beams  
rare gas-halide lasers

*light bulbs*

USE **luminaires**

*light communication*

USE **optical communication**

### light curve

RT ∞ curves  
light (visible radiation)  
stellar radiation

*light duration*

USE **flash pulse duration**

### light elements

GS chemical elements  
. **light elements**  
RT ∞ elements  
low density materials

### light emission

UF *optical emission*  
GS emission  
. **light emission**  
. . incandescence  
. . luminescence  
. . . bioluminescence  
. . . cathode glow  
. . . cathodoluminescence  
. . . chemiluminescence  
. . . electroluminescence  
. . . fluorescence  
. . . . laser induced fluorescence  
. . . . phosphorescence  
. . . . resonance fluorescence  
. . . . x ray fluorescence  
. . . lunar luminescence  
. . . optical resonance

. . . photoluminescence  
. . . . triboluminescence  
. . . . x ray fluorescence  
. . . shock wave luminescence  
. . . sonoluminescence  
. . . spacecraft glow  
. . . thermoluminescence

RT airglow

auroral absorption  
auroral ionization  
auroral spectroscopy  
auroras  
diffraction radiation  
dimming  
electromagnetic radiation  
linear polarization  
∞ optics  
self sustained emission  
sky brightness  
spectral emission  
stimulated emission  
white holes (astronomy)

### light emitting diodes

DEF Pn junction semiconductor devices that emit incoherent optical radiation when biased in the forward direction. Used for LED (diodes).

UF *LED (diodes)*

GS electronic equipment  
. diodes  
. . semiconductor diodes  
. . . **light emitting diodes**  
. . solid state devices  
. . semiconductor devices  
. . . **light emitting diodes**  
optoelectronic devices  
. **light emitting diodes**  
RT aircraft instruments  
alphanumeric characters  
display devices  
electroluminescence  
fiber optics  
luminescence  
photonics  
surface emitting lasers

### light gas guns

GS gas guns  
. **light gas guns**  
RT hypervelocity projectiles

### light helicopters

(added June 1989)

GS light aircraft  
. **light helicopters**  
. . OH-4 helicopter  
. . OH-5 helicopter  
. . OH-6 helicopter  
. . OH-58 helicopter  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . **light helicopters**  
. . . . OH-4 helicopter  
. . . . OH-5 helicopter  
. . . . OH-6 helicopter  
. . . . OH-58 helicopter  
RT ∞ aircraft  
military helicopters  
observation aircraft

*light intensity*

USE **luminous intensity**

### light intratheater transport

GS light aircraft  
. **light intratheater transport**  
transport aircraft  
. **light intratheater transport**  
RT ∞ aircraft  
COIN aircraft

### light ions

DEF Ions of helium, boron, and other elements used in implantation experiments.  
GS ions  
. **light ions**  
RT chemical elements  
heavy ions

- plasmas (physics)
- light modulation**
- UF *optical maser modulation*
  - optical modulation*
  - GS modulation
    - . **light modulation**
    - . . Miros system
    - . . ultrasonic light modulation
  - RT amplitude modulation
    - Bragg cells
    - deformable mirrors
    - electro-optical effect
    - frequency modulation
    - Kerr electrooptical effect
    - lasers
    - light modulators
    - light valves
    - modulators
    - optical heterodyning
    - optical resonators
    - optical switching
  - ∞ optics
    - polarization modulation
    - pulse modulation
    - traveling wave modulation
    - tunable lasers
- light modulators**  
(added September 1995)
- GS modulators
    - . **light modulators**
  - RT acousto-optics
    - electro-optics
    - light modulation
    - magneto-optics
    - optical data processing
- light pressure*  
USE **illuminance**
- light probes*  
USE **light beams**
- light scattering**
- GS scattering
    - . wave scattering
    - . . electromagnetic scattering
    - . . . **light scattering**
    - . . . . halos
    - transmission
    - . electromagnetic wave transmission
    - . . light transmission
    - . . . **light scattering**
    - . . . . halos
    - . wave propagation
    - . . **light scattering**
    - . . . halos
  - RT afterglows
    - atmospheric scattering
    - bidirectional reflectance
    - Brillouin effect
    - circumsolar radiation
    - diffuse radiation
    - electromagnetic absorption
    - forward scattering
    - gravitational lenses
    - infrared absorption
    - optical coatings
    - Rayleigh scattering
    - reflection nebulae
    - scatter plates (optics)
    - speckle patterns
    - transmissivity
    - tropospheric scattering
    - Umkehr effect
- light scattering meters**
- GS measuring instruments
    - . optical measuring instruments
    - . . **light scattering meters**
    - optical equipment
    - . optical measuring instruments
    - . . **light scattering meters**
  - RT meteorological instruments
- light sources**
- GS **light sources**
    - . illuminators
  - RT arc lamps
- cathodoluminescence
- dayglow
- duochromators
- electric arcs
- electroluminescence
- flash lamps
- glow discharges
- HCN lasers
- heat sources
- illuminating
- lasers
- lighting equipment
- luminaires
- mercury lamps
- monochromators
- moon
- plasma display devices
- point sources
- porous silicon
- radiation sources
- sun
- light speed**
- GS rates (per time)
    - . **light speed**
    - velocity
    - . **light speed**
  - RT high speed
    - relativistic velocity
    - Schwarzschild metric
- light transmission**
- UF *optical absorption*
  - GS transmission
    - . electromagnetic wave transmission
    - . . **light transmission**
    - . . . light scattering
    - . . . . halos
  - RT absorbptance
    - atmospheric optics
    - atmospheric refraction
    - Fermat principle
    - fiber optics
    - flicker
    - gamma ray lasers
    - geometrical optics
    - haze
    - holographic optical elements
    - illuminating
    - ∞ illumination
    - integrated optics
    - lasers
    - low visibility
    - molecular absorption
    - opacity
    - optical bistability
    - optical coupling
    - optical properties
    - optical reflection
    - optical waveguides
    - rainbows
    - Sagnac effect
    - squeezed states (quantum theory)
    - stimulated emission devices
    - thermochromic coatings
    - translucence
    - transparence
    - turbidity
    - ultraviolet lasers
    - visibility
    - wave dispersion
    - wave propagation
- light transport aircraft**  
DEF A classification of multiengine air-planes having a maximum passenger capacity of 30 seats and a gross weight of about 35,000 pounds.
- GS commercial aircraft
    - . **light transport aircraft**
    - transport aircraft
    - . **light transport aircraft**
  - RT ∞ aircraft
    - multiengine vehicles
    - passenger aircraft
- light valves**  
DEF Optical shutters which, when activated by light, become either transparent or opaque.
- RT electro-optics
- light modulation
- liquid crystals
- optical data processing
- light water**
- DEF Water in which both hydrogen atoms in each molecule are of the isotope protium. Used for protium.
  - UF *protium*
  - GS hydrogen compounds
    - . **light water**
    - water
    - . **light water**
- light water breeder reactors**
- GS nuclear reactors
    - . breeder reactors
    - . . **light water breeder reactors**
  - RT heavy water reactors
- light water reactors**
- DEF Nuclear reactors using ordinary (rather than heavy) water as moderator.
  - GS nuclear reactors
    - . liquid cooled reactors
    - . . water cooled reactors
    - . . . **light water reactors**
  - RT water moderated reactors
- light-cone expansion**
- RT field theory (physics)
    - Minkowski space
    - quantum mechanics
    - relativity
    - space-time functions
- Lighthill gas model**
- GS models
    - . **Lighthill gas model**
  - RT boundary layer flow
    - gas mixtures
    - gas transport
    - hypersonic flow
    - molecular theory
    - transport properties
- Lighthill method**
- RT airfoil profiles
    - airfoils
    - conformal mapping
    - flow theory
    - integral transformations
  - ∞ methodology
- lighting*  
USE **illuminating**
- lighting equipment**
- GS **lighting equipment**
    - . illuminators
    - . luminaires
    - . . aircraft lights
    - . . airport lights
    - . . . runway lights
    - . . arc lamps
    - . . flash lamps
    - . . . alkali vapor lamps
    - . . mercury lamps
    - . . quartz lamps
    - . . searchlights
    - . . xenon lamps
  - RT ∞ electric equipment
  - ∞ equipment
  - ∞ flares
    - illuminating
    - light (visible radiation)
    - light sources
    - onboard equipment
    - waste energy utilization
- lightning**
- DEF A discharge of atmospheric electricity accompanied by a vivid flash of light.
  - GS electric current
    - . electric discharges
    - . . **lightning**
    - . . . ball lightning
    - . . . cloud-to-cloud discharges
    - . . . cloud-to-ground discharges
    - . . . intracloud discharges

# lightning suppression

. . . leaders (meteorology)

. . . stepped leaders

- RT ∞ arresters
  - atmospheric electricity
  - electric arcs
  - electric sparks
  - electricity
  - electrodeless discharges
  - elves
  - gas discharges
  - lightning suppression
  - nitrogenation
  - radiative recombination
  - sprites (atmospheric physics)
  - static electricity
  - thunderstorms
  - whistlers

## lightning suppression

- GS weather modification
  - . lightning suppression
- RT atmospheric electricity
  - climatology
  - electric discharges
  - lightning
  - thunderstorms

## lights

USE luminaires

## lignin

DEF That part of plant material which is not saccharified by the action of 72 percent sulfuric acid or 42 percent hydrochloric acid, after the resins, waxes, and tannins have been removed.

- GS biopolymers
  - . lignin
- RT cellulose
  - ∞ polymers

## lignite

DEF Coal of relatively recent origin, an intermediate between peat and bituminous coal.

- GS fuels
  - . chemical fuels
  - . . hydrocarbon fuels
  - . . . fossil fuels
  - . . . . coal
  - . . . . . lignite
- resources
  - . Earth resources
  - . . fossil fuels
  - . . . coal
  - . . . . lignite
- rocks
  - . sedimentary rocks
  - . . carbonaceous rocks
  - . . . coal
  - . . . . lignite
- RT ashes
  - bitumens
  - carbonaceous materials
  - coal gasification
  - coal liquefaction
  - coal utilization
  - coke
  - energy conversion
  - energy policy
  - energy technology
  - gaseous fuels
  - hydrocarbon fuel production
  - hydrogen production
  - hydropyrolysis
  - synthane

## LIGO (observatory)

(added December 2000)

UF Laser Interferometer Gravitational-Wave Observatory

- GS antennas
  - . gravitational wave antennas
  - . . LIGO (observatory)
- observatories
  - . astronomical observatories
  - . . LIGO (observatory)
- RT astronomical interferometry
  - gravitational waves

laser interferometry

## likelihood ratio

DEF The probability of a random drawing of a specified sample from a population, assuring a given hypothesis about the parameters of the population, divided by the probability of a random drawing of the same sample, assuring that the parameters of the population are such that this probability is maximized.

- GS ratios
  - . likelihood ratio
- statistical analysis
  - . likelihood ratio
- RT estimates
  - Fisher information
  - mathematical models
  - maximum likelihood estimates
  - probability theory
  - statistical tests

## limb brightening

DEF The increase in the intensity of radio or x ray brightness of the sun or other stars from its center to its limb.

- RT B stars
  - brightness
  - brightness temperature
- ∞ limbs
  - solar flux
  - solar flux density
  - solar granulation
  - solar limb
  - stellar atmospheres
  - stellar luminosity

## limb darkening

DEF A condition, sometimes observed on celestial bodies, in which the brightness of the object decreases as the edges or limbs of the object are approached. The sun and Jupiter exhibit limb darkening.

- GS darkening
  - . limb darkening
- RT B stars
  - binary stars
- ∞ limbs
  - solar limb
  - stellar atmospheres
  - stellar luminosity

∞ limbs

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Earth limb
  - limb brightening
  - limb darkening
  - limbs (anatomy)
  - lunar limb
  - planetary limb
  - solar limb

## limbs (anatomy)

- GS anatomy
  - . limbs (anatomy)
  - . . arm (anatomy)
  - . . . elbow (anatomy)
  - . . . forearm
  - . . hand (anatomy)
  - . . . fingers
  - . . leg (anatomy)
  - . . . feet (anatomy)
  - . . . knee (anatomy)
  - . . . thigh
- RT appendages
  - hindlimb suspension
  - human body
- ∞ limbs

## lime

USE calcium oxides

## limen

DEF Threshold; a psychophysical concept denoting the lowest detectable intensity of any sensory stimulus.

- RT psychological tests

thresholds (perception)

## limestone

DEF Sedimentary rock composed principally of calcium carbonate (the mineral calcite) or the double carbonate of calcium and magnesium (the mineral dolomite) or mixture of the two.

- GS rocks
  - . sedimentary rocks
  - . . limestone
- RT aggregates
  - calcium carbonates
  - dolomite (mineral)
  - Earth resources
  - fluxes
  - minerals
  - schist
  - soils

## limitations

USE constraints

## limiter amplifiers

- GS amplifiers
  - . limiter amplifiers

## limiter circuits

- GS circuits
  - . limiter circuits
  - . . clipper circuits
- RT circulators (phase shift circuits)
  - clamping circuits
  - current regulators
  - power limiters

## limiters (fusion reactors)

DEF Material aperture in fusion power reactors which collect particles from the outer surfaces of the plasmas to control their transport to regions of low density.

- RT blankets (fusion reactors)
  - controlled fusion
  - divertors (fusion reactors)
  - fusion reactors
  - moderation (energy absorption)
  - moderators
  - plasma control
  - plasma loss
  - reactor design
  - reactor materials
  - tokamak devices
  - toroidal plasmas
  - walls

∞ limits

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ignition limits
  - limits (mathematics)
  - range (extremes)

## limits (mathematics)

- GS analysis (mathematics)
  - . calculus
  - . . limits (mathematics)
  - . . real variables
  - . . extremum values
  - . . . limits (mathematics)
- RT differential calculus
  - ∞ envelopes
  - ∞ limits

## limnology

DEF The physical, chemical, meteorological, and especially the biological and ecological conditions in inland waters.

- RT aquifers
  - arroyos
  - Earth hydrosphere
  - fresh water
  - geochemistry
  - geophysics
  - ground water
- ∞ hydraulics
  - hydrography
  - hydrology
  - Lake Texoma (OK-TX)
  - lakes
  - marine biology

- marine chemistry
  - ponds
  - potable water
  - rain
  - streams
  - water
  - water management
  - water pollution
  - water resources
  - wells
- limonite**
- GS iron compounds
    - . **limonite**
    - minerals
    - . **limonite**
- Lincoln Experimental Satellites**
- UF *LES (satellites)*
  - GS artificial satellites
    - . **Lincoln Experimental Satellites**
- line current**
- GS electric current
    - . **line current**
  - RT electric power supplies
    - electrodynamics
    - magnetohydrodynamic flow
    - plasma currents
    - ∞ power supplies
- line of sight**
- DEF An aim or observation taken with mechanical or optical aid to establish a direct path to an objective, target, etc.
  - RT area
    - coordinates
    - ∞ direction
    - loci
    - proportional navigation
    - targets
- line of sight communication**
- DEF Electromagnetic wave propagation, usually microwaves, in a straight line between the transmitter and receiver. The useful transmission distance is generally limited to the horizon as sighted from the elevation of the transmitter.
  - GS telecommunication
    - . communication
    - . . **line of sight communication**
  - RT boresight error
    - frequency modulation
    - space communication
    - television transmission
- line shape**
- GS shapes
    - . **line shape**
  - RT curves (geometry)
    - inflection points
    - ∞ profiles
- line spectra**
- DEF The spontaneous emission of electromagnetic radiation from the bound electrons as they jump from high to low energy levels in an atom. Used for spectral lines.
  - UF *spectral lines*
  - GS spectra
    - . radiation spectra
    - . . electromagnetic spectra
    - . . . **line spectra**
    - . . . . Balmer series
    - . . . . D lines
    - . . . . electronic spectra
    - . . . . Fraunhofer lines
    - . . . . H lines
    - . . . . . H alpha line
    - . . . . . H beta line
    - . . . . . H gamma line
    - . . . . K lines
    - . . . . Lyman spectra
    - . . . . Paschen series
    - . . . . Rydberg series
    - . . . . telluric lines
  - RT absorption spectra
    - atomic energy levels
    - Bohr theory
- emission spectra
  - fine structure
  - flame spectroscopy
  - frequencies
  - hyperfine structure
  - infrared spectra
  - light (visible radiation)
  - ∞ lines
    - molecular spectroscopy
    - oscillator strengths
    - pressure broadening
    - Raman spectra
    - Raman spectroscopy
    - resonance lines
    - rotational spectra
    - Seyfert galaxies
    - solar spectra
    - spectral bands
    - spectral emission
    - spectral energy distribution
    - spectral line width
    - spectral resolution
    - spectrograms
    - spectrum analysis
    - Stark effect
    - stellar spectra
    - ultraviolet spectra
    - visible spectrum
- lineament*
- USE **structural properties (geology)**
- linear AC alternators*
- USE **linear alternators**
- linear accelerators**
- DEF Devices for accelerating charged particles employing alternate electrodes and gaps arranged in a straight line, so proportioned that when their potentials are varied in the proper amplitudes and frequency, particles passing through them receive successive increments of energy.
  - GS particle accelerators
    - . **linear accelerators**
  - RT ∞ accelerators
    - electron accelerators
    - ion sources
    - multipactor discharges
    - neutron sources
- linear alternators**
- (added July 1991)
  - DEF An electromagnetic energy converter that converts reciprocating linear harmonic motion and driving force input to AC electrical power and energy output.
  - UF *linear AC alternators*
  - GS electric generators
    - . AC generators
    - . . **linear alternators**
  - RT free-piston engines
    - ∞ generators
    - Stirling engines
- linear amplifiers**
- GS amplifiers
    - . **linear amplifiers**
- linear arrays**
- DEF Antenna arrays whose elements are equally spaced along a straight line.
  - GS arrays
    - . antenna arrays
    - . . **linear arrays**
    - . . . endfire arrays
    - . . . . Yagi antennas
    - . . . . multispectral linear arrays
  - RT dipole antennas
    - focal plane devices
    - laser arrays
    - multiple beam interval scanners
    - phased arrays
    - pushbroom sensor modes
- linear circuits**
- GS circuits
    - . **linear circuits**
  - RT amplifiers
    - distributed parameter systems
- electrical resistance
  - superposition (mathematics)
  - transconductance
  - volt-ampere characteristics
- linear energy transfer (LET)**
- GS energy transfer
    - . **linear energy transfer (LET)**
  - RT ionizing radiation
- linear equations**
- GS algebra
    - . **linear equations**
    - . . Fflowcs Williams-Hawkings equation
    - . . linear evolution equations
    - . . Riccati equation analysis (mathematics)
    - . real variables
    - . . **linear equations**
    - . . . Fflowcs Williams-Hawkings equation
    - . . . linear evolution equations
    - . . . Riccati equation
  - RT determinants
    - differential equations
  - ∞ equations
    - Floquet theorem
    - Gaussian elimination
    - linear operators
    - matrices (mathematics)
    - operational calculus
    - polynomials
- linear evolution equations**
- DEF Denotes a large class of differential or integral differential equations which are used to describe the evolution in time of some physical systems from an initial state. The equation is said to be linear if the unknown functions and their derivatives appear linearly.
  - GS algebra
    - . linear equations
    - . . **linear evolution equations** analysis (mathematics)
    - . real variables
    - . . linear equations
    - . . . **linear evolution equations**
  - RT difference equations
    - ∞ equations
- linear filters**
- GS **linear filters**
    - . Kalman filters
    - . reduced order filters
  - RT adaptive filters
    - electric filters
    - electromagnetic wave filters
    - ∞ filters
      - frequency response
      - nonlinear filters
- linear integrated circuits**
- GS circuits
    - . integrated circuits
    - . . **linear integrated circuits**
  - RT electronic packaging
    - large scale integration
    - microminiaturization
    - molecular electronics
    - operational amplifiers
    - transistor circuits
- linear operators**
- GS operators (mathematics)
    - . **linear operators**
  - RT linear equations
    - linear systems
    - linear transformations
- linear parameter-varying control**
- (added July 2002)
  - RT ∞ control
    - control systems design
    - feedback control
    - H-infinity control
    - multivariable control
- linear polarization**
- DEF Polarization of an electromagnetic



## linear prediction

wave in which the electric vector at a fixed point in space remains pointing in a fixed direction although varying in magnitude. Also known as plane polarization.

- GS polarization (waves)
  - . **linear polarization**
- RT light emission
  - microwave emission
  - optical polarization
- ∞ polarization
  - polarized electromagnetic radiation
  - polarized radiation
  - radio astronomy

### linear prediction

- GS predictions
  - . **linear prediction**
- RT computation
  - differential pulse code modulation
  - mathematical models
  - operations research
  - quality control
  - statistical analysis

### linear programming

DEF An optimization problem characterization in which a set of parameter values are to be determined, subject to given linear constraints.

- GS optimization
  - . mathematical programming
  - . . **linear programming**
  - research
  - . **linear programming**
- RT ∞ applications of mathematics
  - computer programming
  - constraints
  - dynamic programming
  - formalism
  - game theory
  - matrices (mathematics)
  - nonlinear programming
  - numerical analysis
  - operations research
- ∞ programming
  - simplex method

### linear quadratic Gaussian control

DEF A type of optimal-state feedback control whose design considers noise. It is primarily used to control aircraft and spacecraft systems. Used for LQG control.

- UF *LQG control*
- GS automatic control
  - . optimal control
  - . . **linear quadratic Gaussian control**
  - optimization
    - . linear quadratic regulator
    - . . **linear quadratic Gaussian control**
  - . optimal control
  - . . **linear quadratic Gaussian control**
- RT ∞ control
  - control systems design
  - control theory
  - feedback control
  - H-2 control
  - H-infinity control
  - Kalman filters

### linear quadratic regulator

DEF A type of optimal-state feedback controller that does not consider noise. It is primarily used to control aircraft and spacecraft. Used for linear regulator and LQR.

- UF *linear regulator*
  - LQR*
- GS optimization
  - . **linear quadratic regulator**
  - . . linear quadratic Gaussian control
- RT ∞ control
  - control systems design
  - control theory
  - controllers
  - feedback control
  - Kalman filters

optimal control

### linear receivers

- GS receivers
  - . **linear receivers**
- RT frequency response
  - Nyquist frequencies

### linear regulator

- USE **linear quadratic regulator**

### linear systems

- RT distributed parameter systems
  - linear operators
  - nonlinear systems
  - robustness (mathematics)
  - state estimation
- ∞ systems
  - tracking problem
  - uncertain systems

### linear transformations

- GS algebra
  - . **linear transformations**
  - functions (mathematics)
  - . **linear transformations**
  - transformations (mathematics)
  - . **linear transformations**
- RT Fourier analysis
  - Jordan form
  - linear operators
  - matrices (mathematics)
  - orthogonal functions
  - Schwartz inequality
  - vector spaces

### linear vibration

- GS vibration
  - . structural vibration
  - . . **linear vibration**
- RT free vibration
  - missile vibration
  - random vibration
  - vibration mode

### linearity

DEF The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points; usually expressed as a percentage of the full scale.

- GS **linearity**
  - . collinearity
- RT accuracy
  - consistency
  - differential equations
  - dynamic characteristics
  - errors
  - functions (mathematics)
  - instrument errors
  - linearization
  - nonlinearity
  - tolerances (mechanics)
  - variability

### linearization

- RT Bernoulli theorem
  - ∞ equations
  - Galerkin method
  - linearity
  - simplification

### linen

- GS fabrics
  - . **linen**
  - fibers
  - . **linen**
  - textiles
  - . **linen**
- RT organic materials

### liners

- USE **linings**

### ∞ lines

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT delay lines
  - line spectra
  - lines of force

pipelines  
terminator lines  
tetherlines  
transmission lines  
underground transmission lines

### lines (geometry)

- GS geometry
  - . Euclidean geometry
  - . . **lines (geometry)**
  - . . . chords (geometry)
  - . . . geodesic lines
- RT radii
  - reciprocal theorems
  - segments

### lines of force

- RT barium ion clouds
  - conjugate points
  - field aligned currents
  - flux pinning
  - flux transfer events
- ∞ force
- ∞ lines
  - magnetic circuits
  - magnetic domains
  - magnetic fields
  - magnetic flux
  - magnetic mirrors
  - magnetic properties
  - magnetostatic fields
  - nonuniform magnetic fields
  - polar cusps

### Ling-Temco-Vought aircraft

- UF *LTV aircraft*
- GS **Ling-Temco-Vought aircraft**
  - . A-7 aircraft
  - . F-8 aircraft
  - . XC-142 aircraft
- RT ∞ aircraft

### linguistics

- GS **linguistics**
  - . machine translation
  - . phonemics
  - . phonetics
  - . psycholinguistics
  - . semantics
  - . syntax
- RT languages
  - natural language processing
  - orthography
  - phonemes
  - predicate logic
  - speech
  - speech recognition

### lining processes

- RT coating
  - coatings
  - insulation
  - linings
  - sealing
  - tunneling (excavation)

### linings

- UF *liners*
- GS **linings**
  - . rocket linings
- RT bushings
  - ∞ casing
  - coatings
  - inserts
  - insulation
  - jackets
  - lining processes
  - sheaths
  - shielding
  - ∞ tubes

### linkages

- RT cams
  - connectors
  - coupling
  - couplings
  - eccentrics
  - fasteners
  - fittings
  - joints (junctions)

- latches
- ∞ links
  - mechanical devices
  - unions (connectors)
  - yokes
- linking
  - USE **joining**
- ∞ links
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT chains
    - data links
    - linkages
    - links (mathematics)
- links (mathematics)**
  - GS geometry
    - . topology
    - . **links (mathematics)**
  - RT ∞ links
- Liouville equations**
  - GS analysis (mathematics)
    - . real variables
    - . differential equations
    - . partial differential equations
    - . . . **Liouville equations**
  - RT ∞ equations
    - plasma physics
    - plasmas (physics)
    - statistical mechanics
- Liouville theorem**
  - GS analysis (mathematics)
    - . complex variables
    - . **Liouville theorem**
  - theorems
    - . **Liouville theorem**
- lip reading**
  - GS communicating
    - . **lip reading**
  - reading
    - . **lip reading**
- lipid metabolism**
  - GS metabolism
    - . protein metabolism
    - . **lipid metabolism**
  - RT glucocorticoids
    - ∞ nutrients
    - oils
- lipids**
  - GS organic compounds
    - . **lipids**
    - . . . calciferol
    - . . . castor oil
    - . . . fats
    - . . . lipoproteins
    - . . . phyloquinone
    - . . . retinene
    - . . . steroids
    - . . . . cholesterol
    - . . . . corticosteroids
    - . . . . aldosterone
    - . . . . hydroxycorticosteroid
    - . . . . cortisone
    - . . . . glucocorticoids
    - . . . . estrogens
    - . . . . prostaglandins
    - . . . . tocopherol
  - RT amino acids
    - esters
    - glycerols
    - myelin
  - ∞ nutrients
- lipoic acid**
  - GS acids
    - . carboxylic acids
    - . . . fatty acids
    - . . . **lipoic acid**
  - organic compounds
    - . carboxylic acids
    - . . . fatty acids
- . . . **lipoic acid**
- lipoproteins**
  - GS biopolymers
    - . proteins
    - . . . **lipoproteins**
  - organic compounds
    - . lipids
    - . . . **lipoproteins**
    - . . . proteins
    - . . . **lipoproteins**
- lips (anatomy)**
  - GS anatomy
    - . digestive system
    - . . . mouth
    - . . . **lips (anatomy)**
    - . . . face (anatomy)
    - . . . mouth
    - . . . **lips (anatomy)**
  - RT head (anatomy)
- Lipschitz condition**
  - GS analysis (mathematics)
    - . real variables
    - . **Lipschitz condition**
  - conditions
    - . **Lipschitz condition**
  - RT differential equations
- liquefaction**
  - GS phase transformations
    - . **liquefaction**
    - . . . coal liquefaction
  - RT ∞ condensation
    - ∞ conversion
      - jet condensers
      - melting
      - noncondensable gases
      - thixotropy
- liquefied gases**
  - GS gases
    - . **liquefied gases**
    - . . . liquefied natural gas
    - . . . liquid air
    - . . . liquid ammonia
    - . . . liquid fluorine
    - . . . liquid helium
    - . . . . liquid helium 2
    - . . . liquid hydrogen
    - . . . liquid neon
    - . . . liquid nitrogen
    - . . . liquid oxygen
  - liquids
    - . **liquefied gases**
    - . . . liquefied natural gas
    - . . . liquid air
    - . . . liquid ammonia
    - . . . liquid fluorine
    - . . . liquid helium
    - . . . . liquid helium 2
    - . . . liquid hydrogen
    - . . . liquid neon
    - . . . liquid nitrogen
    - . . . liquid oxygen
  - RT condensates
    - condensers (liquefiers)
    - cryogenic rocket propellants
    - cryogenics
      - gas mixtures
      - liquid rocket propellants
      - solid cryogen cooling
- liquefied natural gas**
  - UF *LNG*
  - GS fuels
    - . chemical fuels
    - . . . hydrocarbon fuels
    - . . . . fossil fuels
    - . . . . natural gas
    - . . . . . **liquefied natural gas**
    - . . . . . gaseous fuels
    - . . . . . natural gas
    - . . . . . **liquefied natural gas**
    - . . . . . gaseous fuels
    - . . . . . flammable gases
    - . . . . . gaseous fuels
    - . . . . . natural gas
    - . . . . . **liquefied natural gas**
- . . . **liquefied natural gas**
- . . . liquefied gases
- . . . **liquefied natural gas**
- geophysical fluids
  - . natural gas
  - . . . **liquefied natural gas**
  - liquids
    - . liquefied gases
    - . . . **liquefied natural gas**
  - organic compounds
    - . hydrocarbons
    - . . . natural gas
    - . . . . **liquefied natural gas**
  - resources
    - . Earth resources
    - . . . fossil fuels
    - . . . . natural gas
    - . . . . . **liquefied natural gas**
  - RT methane
- liquid air**
  - GS gases
    - . gas mixtures
    - . . . air
    - . . . **liquid air**
  - liquefied gases
    - . **liquid air**
  - liquids
    - . liquefied gases
    - . . . **liquid air**
  - mixtures
    - . solutions
    - . . . gas mixtures
    - . . . . air
    - . . . . **liquid air**
- liquid air cycle engines**
  - UF *LACE (engine)*
  - GS engines
    - . rocket engines
    - . . . liquid propellant rocket engines
    - . . . **liquid air cycle engines**
  - RT aerospace planes
    - hydrogen oxygen engines
    - sustainer rocket engines
    - turbo-rocket engines
- liquid alloys**
  - GS alloys
    - . **liquid alloys**
  - RT metals
- liquid ammonia**
  - GS gases
    - . ammonia
    - . . . **liquid ammonia**
  - liquefied gases
    - . . . **liquid ammonia**
  - inorganic compounds
    - . ammonia
    - . . . **liquid ammonia**
  - liquids
    - . liquefied gases
    - . . . **liquid ammonia**
  - nitrogen compounds
    - . ammonia
    - . . . **liquid ammonia**
  - RT fuels
    - liquid fuels
- liquid atomization**
  - GS atomizing
    - . **liquid atomization**
  - RT gas atomization
    - spraying
- liquid bearings**
  - GS bearings
    - . **liquid bearings**
  - RT lubrication
- liquid breathing**
  - GS respiration
    - . **liquid breathing**
  - RT acclimatization
    - pressure breathing
    - resuscitation
- liquid bridges**
  - (added September 1993)

## liquid chromatography

DEF Axisymmetric liquid columns held by capillary forces and forming an interface between two solids or between two gaps in a solid. Useful in space processing.

RT ∞ bridges  
capillary flow  
containerless melts  
interfacial tension  
liquid-solid interfaces  
low gravity manufacturing  
Marangoni convection  
space manufacturing  
space processing

### liquid chromatography

GS chemical tests  
. chemical analysis  
. chromatography  
. . . **liquid chromatography**  
RT colorimetry  
gel chromatography  
paper chromatography  
sorption

### liquid cooled reactors

GS nuclear reactors  
. **liquid cooled reactors**  
. . . liquid metal cooled reactors  
. . . advanced sodium cooled reactor  
. . . Experimental Breeder Reactor 1  
. . . Experimental Breeder Reactor 2  
. . . Lithium Cooled Reactor Experiment  
. . . Los Alamos Molten Plutonium Reactor  
. . . military compact reactors  
. . . sodium graphite reactors  
. . . sodium reactor experiment  
. . . organic cooled reactors  
. . . experimental organic cooled reactors  
. . . water cooled reactors  
. . . boiling water reactors  
. . . experimental boiling water reactors  
. . . Halden Boiling Water Reactor  
. . . Los Alamos Water Boiler Reactor  
. . . Pathfinder nuclear reactor  
. . . Spert reactors  
. . . heavy water reactors  
. . . heavy water components test reactors  
. . . plutonium recycle test reactor  
. . . zero power reactor 2  
. . . light water reactors  
. . . NRX reactors  
. . . Plum Brook Reactor  
. . . pressurized water reactors  
. . . spectral shift control reactor  
. . . swimming pool reactors  
. . . zero power reactors  
. . . zero power reactor 2  
. . . zero power reactor 3  
. . . zero power reactor 6  
. . . zero power reactor 9  
RT sodium cooling

### liquid cooling

SN (COOLING WITH LIQUIDS)  
UF *water cooling*  
GS cooling  
. **liquid cooling**  
. . film cooling  
RT air cooling  
capillary pumped loops  
coolants  
cooling systems  
sodium cooling  
space cooling (buildings)  
sweat cooling  
thermal pollution  
water immersion

### liquid crystals

GS crystals  
. **liquid crystals**  
RT anisotropic fluids  
cholesterol  
ferroelectric materials

light valves

### liquid drops

USE **drops (liquids)**

### liquid filled shells

GS shells (structural forms)  
. fluid filled shells  
. . . **liquid filled shells**  
RT hydrodynamic ram effect  
propellant tanks  
reinforced shells  
shell stability  
∞ storage  
tanks (containers)  
∞ vessels

### liquid flow

GS fluid flow  
. **liquid flow**  
. . open channel flow  
. . water flow  
RT critical flow  
gas flow  
head (fluid mechanics)  
head flow  
hydrodynamic coefficients  
laminar flow  
mass flow  
multiphase flow  
nonNewtonian flow  
orifice flow  
pipe flow  
pressure gradients  
pressure heads  
rheology  
single-phase flow  
Soret coefficient  
steady flow  
subcritical flow  
supercritical flow  
turbulent flow  
two phase flow  
uniform flow  
unsteady flow

### liquid fluorine

GS chemical elements  
. halogens  
. . fluorine  
. . . **liquid fluorine**  
gases  
. liquefied gases  
. . **liquid fluorine**  
liquids  
. liquefied gases  
. . **liquid fluorine**

### liquid fuels

GS fuels  
. chemical fuels  
. . **liquid fuels**  
. . . antimisting fuels  
. . . diesel fuels  
. . . gasoline  
. . . hydrogen fuels  
. . . jet engine fuels  
. . . JP-4 jet fuel  
. . . JP-5 jet fuel  
. . . JP-6 jet fuel  
. . . JP-7 jet fuel  
. . . JP-8 jet fuel  
. . . fuel oils  
. . . kerosene  
RT aircraft fuels  
automobile fuels  
fuel production  
gaseous fuels  
liquid ammonia  
liquid hydrogen  
liquid rocket propellants  
liquids  
synthetic fuels

### liquid helium

UF *helium 2*  
GS chemical elements  
. rare gases  
. . helium  
. . . **liquid helium**

. . . liquid helium 2  
gases  
. liquefied gases  
. . **liquid helium**  
. . . liquid helium 2  
. rare gases  
. . helium  
. . . **liquid helium**  
. . . . liquid helium 2  
liquids  
. cryogenic fluids  
. . **liquid helium**  
. . . liquid helium 2  
. liquefied gases  
. . **liquid helium**  
. . . liquid helium 2  
RT cryostats  
superfluidity  
two fluid models

### liquid helium 2

GS chemical elements  
. rare gases  
. . helium  
. . . liquid helium  
. . . . **liquid helium 2**  
gases  
. liquefied gases  
. . liquid helium  
. . . **liquid helium 2**  
. rare gases  
. . helium  
. . . liquid helium  
. . . . **liquid helium 2**  
liquids  
. cryogenic fluids  
. . liquid helium  
. . . **liquid helium 2**  
. liquefied gases  
. . liquid helium  
. . . **liquid helium 2**  
RT cryostats  
superfluidity

### liquid hydrogen

GS chemical elements  
. hydrogen  
. . **liquid hydrogen**  
gases  
. hydrogen  
. . **liquid hydrogen**  
. liquefied gases  
. . **liquid hydrogen**  
liquids  
. cryogenic fluids  
. . **liquid hydrogen**  
. liquefied gases  
. . **liquid hydrogen**  
RT cryogenic rocket propellants  
fuels  
hydrogen fuels  
hydrogen-based energy  
liquid fuels  
slush hydrogen  
topping cycle engines

### liquid injection

GS injection  
. fluid injection  
. . **liquid injection**  
. . . deep well injection (wastes)  
. . . water injection  
RT film cooling  
fuel injection  
fuel sprays  
mixing  
propellant sprays  
thrust vector control

### liquid lasers

GS stimulated emission devices  
. lasers  
. . **liquid lasers**  
RT carbon lasers  
chemical lasers  
dye lasers  
infrared lasers

- organic lasers
- liquid levels**
  - GS level (horizontal)
  - . **liquid levels**
  - RT fluid boundaries
- liquid lithium**
  - GS chemical elements
  - . alkali metals
  - . . lithium
  - . . . **liquid lithium**
  - liquids
  - . liquid metals
  - . . **liquid lithium**
  - metals
  - . alkali metals
  - . . lithium
  - . . . **liquid lithium**
  - . liquid metals
  - . . **liquid lithium**
- liquid mercury*
  - USE **mercury (metal)**
- liquid metal cooled reactors**
  - UF *LMCR (reactors)*
  - GS nuclear reactors
  - . liquid cooled reactors
  - . . **liquid metal cooled reactors**
  - . . . advanced sodium cooled reactor
  - . . . Experimental Breeder Reactor 1
  - . . . Experimental Breeder Reactor 2
  - . . . Lithium Cooled Reactor Experiment
  - . . . Los Alamos Molten Plutonium Reactor
  - . . . military compact reactors
  - . . . sodium graphite reactors
  - . . . sodium reactor experiment
  - RT Enrico Fermi atomic power plant sodium
- liquid metal fast breeder reactors**
  - UF *LMFBR*
  - GS nuclear reactors
  - . breeder reactors
  - . . **liquid metal fast breeder reactors**
  - . fast nuclear reactors
  - . . **liquid metal fast breeder reactors**
  - RT nuclear power reactors
- liquid metals**
  - GS liquids
  - . **liquid metals**
  - . . liquid lithium
  - . . liquid potassium
  - . . liquid sodium
  - . . mercury (metal)
  - . . . mercury isotopes
  - . . . mercury vapor
  - metals
  - . **liquid metals**
  - . . liquid lithium
  - . . liquid potassium
  - . . liquid sodium
  - . . mercury (metal)
  - . . . mercury isotopes
  - . . . mercury vapor
  - RT casting
  - levitation melting
  - lubricants
  - melting
  - metal vapors
  - squeeze casting
- liquid neon**
  - GS chemical elements
  - . rare gases
  - . . neon
  - . . . **liquid neon**
  - gases
  - . liquefied gases
  - . . **liquid neon**
  - . rare gases
  - . . neon
  - . . . **liquid neon**
  - liquids
- . liquefied gases
- . . **liquid neon**
- liquid nitrogen**
  - GS chemical elements
  - . nitrogen
  - . . **liquid nitrogen**
  - gases
  - . liquefied gases
  - . . **liquid nitrogen**
  - . nitrogen
  - . . **liquid nitrogen**
  - liquids
  - . cryogenic fluids
  - . . **liquid nitrogen**
  - . liquefied gases
  - . . **liquid nitrogen**
  - RT high temperature superconductors
  - solid cryogens
- liquid oxidizers**
  - GS liquids
  - . **liquid oxidizers**
  - oxidizers
  - . **liquid oxidizers**
  - RT rocket oxidizers
- liquid oxygen**
  - UF *LOX (oxygen)*
  - GS chemical elements
  - . oxygen
  - . . **liquid oxygen**
  - gases
  - . liquefied gases
  - . . **liquid oxygen**
  - . oxygen
  - . . **liquid oxygen**
  - liquids
  - . cryogenic fluids
  - . . **liquid oxygen**
  - . liquefied gases
  - . . **liquid oxygen**
  - oxidizers
  - . **liquid oxygen**
  - RT cryogenic rocket propellants
  - FLOX
  - oxygen-hydrocarbon rocket engines
  - rocket oxidizers
- liquid oxygen hydrocarbon rocket engines*
  - USE **oxygen-hydrocarbon rocket engines**
- liquid phase epitaxy**
  - DEF A liquid phase transformation during crystal growth.
  - GS growth
  - . crystal growth
  - . . epitaxy
  - . . . **liquid phase epitaxy**
  - RT crystal structure
  - liquid phases
  - vapor phase epitaxy
- liquid phase sintering**
  - (added August 1991)
  - DEF Sintering of a compact, or loose powder aggregate under conditions where a liquid phase is present during part of the sintering cycle.
  - GS sintering
  - . **liquid phase sintering**
  - RT consolidation
  - metal powder
  - powder metallurgy
- liquid phases**
  - RT alloys
  - critical pressure
  - electroepitaxy
  - eutectics
  - liquid phase epitaxy
  - liquids
  - liquidus
  - melting points
  - phase diagrams
  - phase separation (materials)
  - ∞ phases
  - solid phases
  - solid solutions
- solidus
- solubility
- supercritical pressures
- syntectic alloys
- transition temperature
- vapor phase epitaxy
- vapor phases
- liquid plus solid zones*
  - USE **mushy zones**
- liquid potassium**
  - GS chemical elements
  - . alkali metals
  - . . potassium
  - . . . **liquid potassium**
  - liquids
  - . liquid metals
  - . . **liquid potassium**
  - metals
  - . alkali metals
  - . . potassium
  - . . . **liquid potassium**
  - liquid metals
  - . . **liquid potassium**
- liquid propellant rocket engines**
  - DEF Rocket engines using a propellant or propellants in liquid form.
  - GS engines
  - . rocket engines
  - . . **liquid propellant rocket engines**
  - . . . AJ-10 engine
  - . . . F-1 rocket engine
  - . . . H-1 engine
  - . . . hydrazine engines
  - . . . hydrogen oxygen engines
  - . . . . J-2 engine
  - . . . M-1 engine
  - . . . RL-10-A-1 engine
  - . . . RL-10-A-3 engine
  - . . . liquid air cycle engines
  - . . . LR-62-RM-2 engine
  - . . . LR-87-AJ-5 engine
  - . . . LR-91-AJ-5 engine
  - . . . MA-2 engine
  - . . . MA-3 engine
  - . . . MA-5 engine
  - . . . oxygen-hydrocarbon rocket engines
  - . . . RL-10 engines
  - . . . RL-10-A-1 engine
  - . . . RL-10-A-3 engine
  - . . . pulse detonation engines
  - . . . Space Shuttle Main Engine
  - . . . X-405 engine
  - . . . XLR-99 engine
  - . . . YLR-91-AJ-1 engine
  - RT Ablestar launch vehicle
  - Atlas SLV-3 launch vehicle
  - Black Knight rocket vehicle
  - Blue Steel missile
  - Blue Streak launch vehicle
  - Blue Streak missile
  - BOMARC A missile
  - BOMARC B missile
  - booster rocket engines
  - Centaur launch vehicle
  - Corporal missile
  - Corvus missile
  - Delta 4 Heavy launch vehicle
  - Delta Clipper
  - Diamant launch vehicle
  - Dornier paraglider rocket vehicle
  - ducted rocket engines
  - hybrid propellant rocket engines
  - ∞ hybrid rocket engines
  - Hyla-Star rocket vehicle
  - internal combustion engines
  - Juno 1 launch vehicle
  - Juno 2 launch vehicle
  - Juno launch vehicles
  - Jupiter C rocket vehicle
  - Jupiter missile
  - Lance missile
  - Meteor 1 rocket vehicle
  - Navaho missile
  - Nike-Ajax missile
  - Nomad launch vehicle
  - Nova launch vehicles

## liquid rocket propellants

propellant tanks  
 restartable rocket engines  
 retrorocket engines  
 Saturn S-1 stage  
 Saturn S-1B stage  
 Saturn S-1C stage  
 Saturn S-2 stage  
 Saturn S-4 stage  
 Saturn S-4B stage  
 Saturn stages  
 solid propellant rocket engines  
 Sparrow 3 missile  
 sustainer rocket engines  
 Talos missile  
 Thor Able rocket vehicle  
 Thor Agena launch vehicle  
 Thor Delta launch vehicle  
 Thor launch vehicles  
 Thorad launch vehicles  
 Titan ICBM  
 Titan launch vehicles  
 V-1 missile  
 V-2 missile  
 vanguard 2 launch vehicle  
 Vega launch vehicle  
 Vernier engines  
 Veronique rocket vehicles  
 Viking rocket vehicle  
 X-33 reusable launch vehicle  
 X-34 reusable launch vehicle

### liquid rocket propellants

DEF Specifically, rocket propellants in liquid form. Examples of liquid propellants include fuels such as alcohol, gasoline, aniline, liquid ammonia, and liquid hydrogen; oxidants such as liquid oxygen, hydrogen peroxide (also applicable as a monopropellant), and nitric acid; additives such as water; and monopropellants such as nitromethane. Used for bipropellants and tripropellants.

UF *bipropellants*  
*tripropellants*

GS propellants  
 . rocket propellants  
 . . **liquid rocket propellants**  
 . . . cryogenic rocket propellants  
 . . . gelled rocket propellants  
 . . . hypergolic rocket propellants  
 . . . monopropellants  
 . . . RP-1 rocket propellants  
 . . . slurry propellants  
 . . . slush hydrogen  
 . . . aeroxine  
 RT aircraft fuels  
 chemical compatibility  
 chlorine fluorides  
 fuel tank pressurization  
 gaseous rocket propellants  
 high energy propellants  
 hybrid propellants  
 hydrazines  
 hydrogen fuels  
 liquefied gases  
 liquid fuels  
 liquids  
 monomethylhydrazines  
 nitrogen tetroxide  
 propellant sprays  
 solid rocket propellants  
 storable propellants

*liquid rotation*

USE **rotating liquids**

### liquid sloshing

DEF The back and forth movement of a liquid fuel in its tank, creating problems of stability and control in the vehicle. Used for sloshing.

UF *sloshing*

RT aerodynamic stability  
 aircraft stability  
 baffles  
 controllability  
 fuel control  
 fuel tanks  
 interface stability  
 propellant tanks  
 propellant transfer

rotating fluids  
 spacecraft stability  
 storage stability  
 tank geometry  
 ullage

### liquid sodium

GS chemical elements  
 . alkali metals  
 . . sodium  
 . . . **liquid sodium**  
 liquids  
 . liquid metals  
 . . **liquid sodium**  
 metals  
 . alkali metals  
 . . sodium  
 . . . **liquid sodium**  
 . liquid metals  
 . . **liquid sodium**

### liquid surfaces

GS **liquid surfaces**  
 . menisci  
 RT fluid boundaries  
 free boundaries  
 interfacial tension  
 jet boundaries  
 solid surfaces  
 surface waves  
 ∞ surfaces

### liquid wastes

DEF The liquid counterpart of solid wastes from industrial, chemical, metabolic, and/or mineral sources.

GS wastes  
 . **liquid wastes**  
 . . urine  
 . . waste water  
 RT drainage  
 effluents  
 human wastes  
 industrial wastes  
 metabolic wastes  
 ponds  
 sewage  
 sludge  
 solid wastes

### liquid-gas mixtures

GS mixtures  
 . dispersions  
 . . **liquid-gas mixtures**  
 . . . aerosols  
 . . . fog  
 RT air water interactions  
 binary mixtures  
 gas mixtures  
 menisci  
 solubility  
 vapor phases  
 vapor pressure

### liquid-liquid interfaces

GS boundaries  
 . fluid boundaries  
 . . **liquid-liquid interfaces**  
 interfaces  
 . fluid boundaries  
 . . **liquid-liquid interfaces**  
 RT boundary layers  
 free boundaries  
 heat transfer  
 interface stability  
 interfacial energy  
 interfacial tension  
 pressure gradients  
 solubility

### liquids

DEF Substances in a state in which the individual particles move freely with relation to each other and take the shape of the container, but do not expand to fill the container.

GS **liquids**  
 . cryogenic fluids  
 . . Fermi liquids  
 . . FLOX  
 . . liquid helium

. . . liquid helium 2  
 . . liquid hydrogen  
 . . liquid nitrogen  
 . . liquid oxygen  
 . ferrofluids  
 . hydraulic fluids  
 . . Skydrol (trademark)  
 . juices  
 . liquefied gases  
 . . liquefied natural gas  
 . . liquid air  
 . . liquid ammonia  
 . . liquid fluorine  
 . . liquid helium  
 . . . liquid helium 2  
 . . liquid hydrogen  
 . . liquid neon  
 . . liquid nitrogen  
 . . liquid oxygen  
 . liquid metals  
 . . liquid lithium  
 . . liquid potassium  
 . . liquid sodium  
 . . mercury (metal)  
 . . . mercury isotopes  
 . . . mercury vapor  
 . liquid oxidizers  
 . organic liquids  
 . potable liquids  
 . . beverages  
 . . . wines  
 . . potable water  
 . rotating liquids

RT ∞ fluids

globules  
 glycerols  
 liquid fuels  
 liquid phases  
 liquid rocket propellants  
 nonpoint sources  
 phase diagrams  
 vapor phases  
 water

### liquid-solid interfaces

GS boundaries  
 . fluid boundaries  
 . . **liquid-solid interfaces**  
 interfaces  
 . fluid boundaries  
 . . **liquid-solid interfaces**  
 RT boundary layers  
 fluid films  
 fluid-solid interactions  
 ∞ fusion  
 heat transfer  
 interface stability  
 liquid bridges  
 melting  
 menisci  
 metal surfaces  
 phase change materials  
 solid phases  
 solid-solid interfaces  
 squeeze films

### liquidus

RT crystallization  
 liquid phases  
 melting points  
 phase diagrams  
 solid phases  
 solid solutions  
 solidus

### liquid-vapor equilibrium

UF *vapor liquid equilibrium*  
 RT ∞ equilibrium  
 thermodynamic equilibrium  
 vapors

### liquid-vapor interfaces

GS boundaries  
 . fluid boundaries  
 . . **liquid-vapor interfaces**  
 interfaces  
 . fluid boundaries  
 . . **liquid-vapor interfaces**  
 RT air water interactions  
 evaporation

free boundaries  
 heat transfer  
 interface stability  
 menisci  
 pressure gradients  
 solubility  
 vapor phases  
 vapor pressure

**LIRTS (telescope)**

DEF A proposed large infrared telescope for Spacelab superseded by the German infrared laboratory. Used for Large Infrared Telescope on Spacelab.

UF *Large Infrared Telescope on Spacelab*

GS telescopes  
 . spaceborne telescopes

. . . **LIRTS (telescope)**

RT European Space Agency  
 payloads  
 space shuttles  
 Spacelab

**LISA (observatory)**

(added December 2000)

UF *Laser Interferometer Space Antenna*

GS antennas  
 . gravitational wave antennas  
 . . **LISA (observatory)**

artificial satellites  
 . scientific satellites  
 . . astronomical satellites

. . . **LISA (observatory)**

observatories  
 . astronomical observatories  
 . . astronomical satellites

. . . **LISA (observatory)**

RT astronomical interferometry  
 gravitational waves  
 laser interferometry  
 spaceborne astronomy

**LISP (programming language)**

GS languages  
 . programming languages  
 . . **LISP (programming language)**

RT computer programming  
 recursive functions

**Lissajous figures**

DEF Figures where the path of a particle moving in a plane when the components of its position along two perpendicular axes each undergo simple harmonic motions and the ratio of their frequencies is a rational number.

RT eccentric orbits  
 equations of motion  
 libration  
 lunar orbits  
 satellite orbits

**lists**

GS **lists**  
 . hardware utilization lists

RT ∞ catalogs  
 display devices  
 enumeration  
 indexes (documentation)  
 printouts

**literature**

GS **literature**  
 . biography  
 . documentation

RT bibliographies  
 documents  
 indexes (documentation)  
 knowledge  
 libraries  
 papers  
 philosophy

**lithergol rocket engines**

GS engines  
 . rocket engines  
 . . hybrid propellant rocket engines  
 . . . **lithergol rocket engines**

RT ∞ hybrid rocket engines

**lithergolic propellants**

USE **hybrid propellants**

**lithiasis**

GS diseases  
 . **lithiasis**

RT calculi  
 dental calculi

**lithium**

GS chemical elements  
 . alkali metals  
 . . **lithium**  
 . . . liquid lithium  
 . . . lithium isotopes  
 metals  
 . alkali metals  
 . . **lithium**  
 . . . liquid lithium  
 . . . lithium isotopes

**lithium 4**

USE **lithium isotopes**

**lithium 6**

USE **lithium isotopes**

**lithium alloys**

GS alloys  
 . **lithium alloys**  
 . . aluminum-lithium alloys

RT aircraft construction materials  
 aluminum alloys  
 copper alloys  
 magnesium alloys  
 zirconium alloys

**lithium aluminum hydrides**

GS aluminum compounds  
 . **lithium aluminum hydrides**  
 hydrogen compounds  
 . hydrides  
 . . metal hydrides  
 . . . lithium hydrides  
 . . . . **lithium aluminum hydrides**  
 lithium compounds  
 . lithium hydrides  
 . . **lithium aluminum hydrides**

RT powdered aluminum

**lithium batteries**

(added December 1999)

GS electrochemical cells  
 . electric batteries  
 . . **lithium batteries**  
 . . . lithium sulfur batteries

RT storage batteries

**lithium borates**

GS boron compounds  
 . borates  
 . . **lithium borates**  
 lithium compounds  
 . **lithium borates**

**lithium chlorides**

GS halogen compounds  
 . chlorine compounds  
 . . chlorides  
 . . . **lithium chlorides**  
 . halides  
 . . chlorides  
 . . . **lithium chlorides**  
 . metal halides  
 . . . **lithium chlorides**  
 lithium compounds  
 . **lithium chlorides**

**lithium compounds**

GS **lithium compounds**  
 . lithium borates  
 . lithium chlorides  
 . lithium fluorides  
 . lithium hydrides  
 . . lithium aluminum hydrides  
 . lithium hydroxides  
 . lithium iodates  
 . lithium niobates  
 . lithium oxides

. lithium perchlorates  
 . lithium sulfates  
 . organic lithium compounds  
 . spodumene

RT ∞ alkali metal compounds

∞ chemical compounds

∞ metal compounds

metal fuels

**Lithium Cooled Reactor Experiment**

UF *LCRE Reactor*

GS nuclear reactors  
 . liquid cooled reactors  
 . . liquid metal cooled reactors  
 . . . **Lithium Cooled Reactor Experiment**

**lithium fluorides**

GS halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . metal fluorides  
 . . . . **lithium fluorides**  
 . halides  
 . . fluorides  
 . . . metal fluorides  
 . . . . **lithium fluorides**  
 . metal halides  
 . . metal fluorides  
 . . . . **lithium fluorides**  
 lithium compounds  
 . **lithium fluorides**

**lithium hydrides**

GS hydrogen compounds  
 . hydrides  
 . . metal hydrides  
 . . . **lithium hydrides**  
 . . . . lithium aluminum hydrides  
 lithium compounds  
 . **lithium hydrides**  
 . . lithium aluminum hydrides

**lithium hydroxides**

GS bases (chemical)  
 . alkalis  
 . . **lithium hydroxides**  
 hydroxides  
 . **lithium hydroxides**  
 lithium compounds  
 . **lithium hydroxides**

**lithium iodates**

DEF Salts of iodic acid containing the 10 to the third power radical.

GS halogen compounds  
 . iodine compounds  
 . . iodates

. . . **lithium iodates**

lithium compounds

. **lithium iodates**

RT ∞ metal compounds

**lithium isotopes**

UF *lithium 4*  
*lithium 6*

GS chemical elements  
 . alkali metals  
 . . lithium  
 . . . **lithium isotopes**  
 . nuclides  
 . . isotopes  
 . . . **lithium isotopes**  
 metals  
 . alkali metals  
 . . lithium  
 . . . **lithium isotopes**

**lithium niobates**

GS lithium compounds  
 . **lithium niobates**  
 niobium compounds  
 . niobates  
 . . **lithium niobates**

**lithium oxides**

GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . **lithium oxides**

## lithium perchlorates

lithium compounds  
. **lithium oxides**

### lithium perchlorates

GS halogen compounds  
. chlorine compounds  
. . . perchlorates  
. . . **lithium perchlorates**  
lithium compounds  
. **lithium perchlorates**

### lithium sulfates

GS lithium compounds  
. **lithium sulfates**  
sulfur compounds  
. sulfates  
. . **lithium sulfates**

### lithium sulfur batteries

DEF Primary cells for producing electrical energy using lithium metal for one electrode and sulfur for the other.  
GS electrochemical cells  
. electric batteries  
. . lithium batteries  
. . . **lithium sulfur batteries**  
RT ∞ cells  
∞ electric cells  
∞ energy sources  
∞ power supplies

### lithography

DEF The process of printing from a plane surface on which the image to be printed is ink receptive and water repellent and the non-image area is ink repellent and water receptive.  
UF *stereolithography*  
*ultraviolet lithography*  
GS printing  
. **lithography**  
. . photolithography  
RT nanofabrication  
photomechanical effect  
reproduction (copying)

### lithology

DEF Description of the physical character of rocks as determined by eye or with a low-power magnifier and based on color, structure, mineralogical components, and grain size.  
GS geology  
. petrology  
. . **lithology**  
RT regolith  
rocks

### lithosphere

DEF The solid portion of the Earth, as compared to atmosphere and hydrosphere.  
UF *geosphere*  
GS **lithosphere**  
. Earth core  
. Earth crust  
. Earth mantle  
. Earth surface  
RT asthenosphere  
Earth planetary structure  
planetary mantles  
plates (tectonics)  
subduction (geology)

### Lithuania

GS nations  
. **Lithuania**  
RT Europe

### Little Joe 2 launch vehicle

GS launch vehicles  
. **Little Joe 2 launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . **Little Joe 2 launch vehicle**  
RT Algol engine  
Mercury project  
sergeant missiles  
solid propellant rocket engines  
TX-354 engine

XM-33 engine

### Little John rocket vehicle

GS rocket vehicles  
. single stage rocket vehicles  
. . **Little John rocket vehicle**  
surface to surface rockets  
. . **Little John rocket vehicle**  
RT Hercules engine  
solid propellant rocket engines

### littoral currents

USE **coastal currents**

### littoral drift

DEF Material (such as shingle, gravel, sand, and shell fragments) that is moved along the shore by coastal currents.  
RT bars (landforms)  
beaches  
breakwaters  
coasts  
ocean currents  
sands  
sediments

### littoral transport

RT breakwaters  
ocean currents  
sands  
water waves  
∞ waves

### liver

GS anatomy  
. **liver**  
RT gastrointestinal system  
glands (anatomy)  
hepatitis  
tyrosine

### Livermore Pool Type Reactor

UF *LPTR Reactor*  
GS nuclear reactors  
. nuclear research and test reactors  
. . **Livermore Pool Type Reactor**

### liverworts

USE **Bryophytes**

### livestock

GS animals  
. **livestock**  
RT calves  
cattle  
deer  
goats  
horses  
rangelands  
sheep  
swine  
turkeys

### lixiscopes

DEF Portable light weight battery operated low intensity x ray imaging systems with medical, industrial, and scientific applications. Used for Low Intensity X Ray Imaging Scopes.  
UF *Low Intensity X Ray Imaging Scopes*  
GS medical equipment  
. x ray apparatus  
. . **lixiscopes**  
RT portable equipment  
radiography  
x ray astronomy  
x ray imagery

### lizards

GS animals  
. vertebrates  
. . reptiles  
. . . **lizards**

### Llanos Orientales (Colombia)

GS land  
. grasslands  
. . **Llanos Orientales (Colombia)**  
. plains  
. . **Llanos Orientales (Colombia)**  
landforms  
. plains

. . **Llanos Orientales (Colombia)**

RT Colombia

### LLR (ranging)

(added July 2001)  
USE **laser ranging**  
**lunar ranging**

### LMCR (reactors)

USE **liquid metal cooled reactors**

### LMFBR

USE **liquid metal fast breeder reactors**

### LNG

USE **liquefied natural gas**

### load carrying capacity

(added August 1991)  
SN (LIMITED TO STRUCTURAL MECHANICS)  
DEF The capacity of a structure to bear loads.  
GS mechanical properties  
. yield strength  
. . **load carrying capacity**  
RT compressive strength  
creep strength  
critical loading  
fracture strength  
loads (forces)  
∞ strength  
structural failure  
structural stability  
structural strain  
tensile strength

### load distribution (forces)

GS distribution (property)  
. **load distribution (forces)**  
RT ∞ distribution  
transverse loads

### load factors

USE **loads (forces)**

### load testing machines

RT ∞ machinery  
∞ test equipment

### load tests

RT compression tests  
creep tests  
destructive tests  
fatigue tests  
impact tests  
loading rate  
nondestructive tests  
shock tests  
specimen geometry  
spin tests  
static tests  
tensile tests  
∞ tests  
variable amplitude loading

### ∞ loading

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *dummy loads*  
RT feeding (supplying)  
filling  
input  
loading operations  
loads (forces)  
payloads  
refilling  
replenishment  
shafts (machine elements)  
sweep effect  
variable amplitude loading

### loading forces

USE **loads (forces)**

### loading moments

GS moments  
. **loading moments**  
RT aerodynamic loads  
bending moments  
flexing

- loads (forces)
  - mass distribution
  - moment distribution
  - pressure distribution
  - static loads
  - structural analysis
  - torque
  - transverse loads
- loading operations**
- RT feeders
  - ∞ loading
  - materials handling
  - ∞ operations
  - unloading
- loading rate**
- GS rates (per time)
    - . **loading rate**
  - RT impact loads
  - load tests
  - loads (forces)
  - strain rate
  - variable amplitude loading
  - velocity
- loading waves*
- USE **elastic waves**
  - loads (forces)**
- loads (forces)**
- UF *load factors*
  - loading forces*
  - loading waves*
  - GS **loads (forces)**
    - . axial loads
    - . . axial compression loads
    - . compression loads
    - . . axial compression loads
    - . . impact loads
    - . contact loads
    - . . impact loads
    - . . rolling contact loads
    - . critical loading
    - . dynamic loads
    - . . aerodynamic loads
    - . . . blast loads
    - . . . gust loads
    - . . cyclic loads
    - . . rolling contact loads
    - . . thrust loads
    - . . transient loads
    - . . . gust loads
    - . . . impact loads
    - . . . landing loads
    - . . . shock loads
    - . . . . blast loads
    - . . variable amplitude loading
    - . . vibratory loads
    - . . wing loading
    - . edge loading
    - . random loads
    - . . gust loads
    - . static loads
    - . transverse loads
  - RT ballast (mass)
  - ∞ equilibrium
  - ∞ force
    - force distribution
    - Hugoniot equation of state
    - load carrying capacity
  - ∞ loading
    - loading moments
    - loading rate
    - mass distribution
    - mechanics (physics)
    - moment distribution
    - payloads
    - plane stress
    - pressure
    - pressure distribution
    - pressure effects
    - shafts (machine elements)
    - shearing
    - stress concentration
    - stress intensity factors
    - stresses
    - structural design criteria
    - weight (mass)

wind pressure

## ∞ lobes

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT antenna design
- antenna radiation patterns
- backlobes
- sidelobes

*LOC (microelectronics)**(added August 2009)*USE **lab-on-a-chip devices****local area networks**

DEF Networks, generally microcomputer based, that enable users in the same location to use the same programs and equipment such as printers. Used for LAN (computer networks).

UF *LAN (computer networks)*

GS networks

. communication networks

. . **local area networks**

. computer networks

. . **local area networks**

RT architecture (computers)

carrier sense multiple access

data transmission

Ethernet

interprocessor communication

network control

protocol (computers)

VSAT (network)

wide area networks

**local group (astronomy)**

DEF The cluster of galaxies to which our galaxy belongs. It is a poor, irregular cluster with some 20 certain members including the Milky Way Galaxy, the Andromeda Galaxy, the Triangulum, four irregular galaxies, and about 13 intermediate or dwarf ellipticals.

GS celestial bodies

. galactic clusters

. . **local group (astronomy)**

RT Andromeda Galaxy

barred galaxies

cosmology

disk galaxies

dwarf galaxies

elliptical galaxies

Milky Way Galaxy

solar neighborhood

spiral galaxies

Virgo galactic cluster

**local scientific survey module**

GS modules

. **local scientific survey module**

RT instrument packages

lunar exploration

measuring instruments

**local thermodynamic equilibrium***(added April 1991)*UF *LTE (astronomy)*

RT stellar atmospheres

stellar physics

thermodynamic equilibrium

*localization*USE **position (location)****LOCATES system**UF *Location of Air Traffic Satellites*

RT air traffic control

Beacon satellites

navigation satellites

satellite guidance

∞ systems

*location*USE **position (location)***Location of Air Traffic Satellites*USE **LOCATES system****loci**

GS geometry

. Euclidean geometry

. . analytic geometry

. . . **loci**

RT ∞ centers

conics

foci

line of sight

points (mathematics)

resolution

*Lockheed 186 helicopter*USE **XH-51 helicopter****Lockheed aircraft**GS **Lockheed aircraft**

. C-5 aircraft

. C-121 aircraft

. C-130 aircraft

. C-140 aircraft

. C-141 aircraft

. CL-823 aircraft

. Electra aircraft

. F-94 aircraft

. F-104 aircraft

. L-1011 aircraft

. L-2000 aircraft

. Lockheed model 18 aircraft

. P-3 aircraft

. S-3 aircraft

. SR-71 aircraft

. T-33 aircraft

. U-2 aircraft

. X-35 aircraft

. XH-51 helicopter

. XV-4 aircraft

RT ∞ aircraft

*Lockheed C-5 aircraft*USE **C-5 aircraft***Lockheed CL-595 helicopter*USE **XH-51 helicopter***Lockheed CL-823 aircraft*USE **CL-823 aircraft***Lockheed Constellation aircraft*USE **C-121 aircraft***Lockheed L-2000 aircraft*USE **L-2000 aircraft****Lockheed model 18 aircraft**

GS Lockheed aircraft

. **Lockheed model 18 aircraft**

monoplanes

. **Lockheed model 18 aircraft**

transport aircraft

. **Lockheed model 18 aircraft**

RT ∞ aircraft

*Lockheed U-2 aircraft*USE **U-2 aircraft***Lockheed XV-4A aircraft*USE **XV-4 aircraft****locking**UF *interlocking*GS **locking**

. laser mode locking

RT fasteners

∞ joining

locks (fasteners)

retaining

## ∞ locks

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT air locks

locks (fasteners)

**locks (fasteners)**

GS fasteners

. **locks (fasteners)**

RT locking

∞ locks

**locomotion**UF *motility*GS **locomotion**

. astronaut locomotion



## locomotives

. gait  
. running  
. walking  
RT exercise physiology  
navigation  
propulsion  
wheelchairs

### locomotives

RT diesel engines  
handling equipment  
rail transportation  
windshields

### locusts

GS animals  
. invertebrates  
. . . arthropods  
. . . . insects  
. . . . **locusts**  
RT farm crops  
foliage  
infestation  
vegetation

### LOFAR

RT sonar  
underwater acoustics

### LOFTI satellites

USE **low frequency transionospheric satellites**

### lofting

RT aircraft design  
ascent trajectories  
computer aided design  
differential geometry  
engineering drawings  
mathematical models  
spacecraft design  
structural design  
∞ surface geometry  
templates

### log periodic antennas

GS antennas  
. directional antennas  
. . **log periodic antennas**  
RT antenna arrays  
antenna design  
broadband  
dipole antennas  
frequency response  
parasitic elements (antennas)

### log spiral antennas

GS antennas  
. spiral antennas  
. . **log spiral antennas**  
RT dipole antennas

### logarithmic receivers

GS receivers  
. **logarithmic receivers**  
RT communication equipment  
frequency response  
intermediate frequency amplifiers  
transfer functions

### logarithms

DEF The power to which a fixed number, called the base, usually 10 or e (2. 7182818) must be raised to produce the value to which the logarithm corresponds.

GS analysis (mathematics)  
. complex variables  
. . exponential functions  
. . . **logarithms**  
functions (mathematics)  
. transcendental functions  
. . exponential functions  
. . . **logarithms**  
RT exponents

### logging (industry)

DEF The business of felling trees, cutting them up into logs and transporting the logs to sawmills or to a place of sale.  
RT forests

trees (plants)

### ∞ logic

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT artificial intelligence  
axioms  
Boolean algebra  
branching (mathematics)  
complements (mathematics)  
expert systems  
fluid logic  
fluidics  
formalism  
information theory  
logic circuits  
logic design  
mathematical logic  
paradoxes  
philosophy  
predicate calculus  
predicate logic  
∞ principles  
temporal logic  
threshold logic  
transistor logic

### logic circuits

UF *logic networks*  
GS circuits  
. **logic circuits**  
. . threshold gates  
RT adding circuits  
architecture (computers)  
arithmetic and logic units  
central processing units  
computers  
counting circuits  
decisions  
digital computers  
evolvable hardware  
fluid logic  
gates (circuits)  
∞ logic  
logical elements  
matrices (circuits)  
multipliers  
multivibrators  
neural nets  
programmable logic devices  
reconfigurable hardware  
∞ relay  
switching circuits  
threshold logic  
transistor circuits  
transistor logic

### logic design

RT amplifier design  
architecture (computers)  
computer aided design  
computer design  
computer programming  
∞ design  
design analysis  
evolvable hardware  
hardware description languages  
∞ logic  
logic programming  
logical elements  
programmable logic devices  
switching theory  
transistor logic

### logic networks

USE **logic circuits**

### logic programming

GS computer programming  
. **logic programming**  
RT artificial intelligence  
expert systems  
logic design  
temporal logic

### logic units

USE **arithmetic and logic units**

### logical elements

DEF In computers or data processing sys-

tems, the smallest building blocks which can be represented by operators in an appropriate system of symbolic logic. Typical logical elements are the AND gate and flip-flop, which can be represented as operators in a suitable symbolic logic. Used for decision elements.

UF *decision elements*  
RT computer components  
digital electronics  
∞ elements  
gates (circuits)  
logic circuits  
logic design

### logistics

GS **logistics**  
. lunar logistics  
. space logistics  
RT aircraft maintenance  
Army-Navy instrumentation program  
command and control  
cranes  
deployment  
downtime  
∞ electric equipment  
energy policy  
∞ facilities  
inventory management  
maintenance  
matrix management  
portable equipment  
rapid transit systems  
resource allocation  
resources  
services  
shipyards  
site selection  
stockpiling  
∞ storage  
stowage (onboard equipment)  
transportation  
∞ travel  
utilities

### logistics management

GS management  
. **logistics management**  
. . inventory management  
. . . inventory controls  
RT ∞ facilities  
maintenance  
resources  
services  
spare parts  
∞ storage

### logistics over the shore (LOTS) carrier

RT military technology

### LOH helicopter

USE **OH-6 helicopter**

### Loki rocket vehicle

GS rocket vehicles  
. single stage rocket vehicles  
. . **Loki rocket vehicle**  
. . sounding rockets  
. . . **Loki rocket vehicle**  
RT solid propellant rocket engines  
WASP sounding rocket

### LOLA (simulator)

USE **lunar orbit and landing simulators**

### Lomonosov current

GS circulation  
. water circulation  
. . water currents  
. . . ocean currents  
. . . . **Lomonosov current**  
RT Atlantic Ocean  
Gulf Stream  
tropical regions

### Long Duration Exposure Facility

UF *LDEF*  
GS artificial satellites  
. scientific satellites  
. . **Long Duration Exposure Facility**  
laboratories

. space laboratories  
 . . **Long Duration Exposure Facility**  
 space platforms  
 . **Long Duration Exposure Facility**  
 RT space weathering  
 spaceborne experiments

**long duration space flight**

DEF Space flight involving interplanetary and/or interstellar travel. Used for extended duration space flight.

UF *extended duration space flight*  
 GS space flight

. **long duration space flight**

RT Crew Exploration Vehicle  
 deep space  
 extraterrestrial environments

∞ flight

flyby missions  
 interplanetary flight  
 interstellar travel  
 manned Mars missions  
 manned space flight  
 Mars bases

∞ missions

planetary environments  
 space adaptation syndrome

**Long Island (NY)**

GS landforms  
 . islands

. . **Long Island (NY)**

RT Atlantic Ocean  
 New York

**Long March launch vehicles**

(added January 1999)

GS launch vehicles

. **Long March launch vehicles**

RT Chinese space program  
 Chinese spacecraft  
 heavy lift launch vehicles  
 Shenzhou 5 spacecraft

*long period variables*

USE **Mira variables**

*long range navigation*

USE **loran**

**long range weather forecasting**

GS meteorology

. weather forecasting  
 . . **long range weather forecasting**  
 predictions

. forecasting

. . weather forecasting

. . . **long range weather forecasting**

RT Atmospheric General Circulation  
 Models  
 numerical weather forecasting  
 statistical weather forecasting

**long term effects**

UF *secular perturbation*

RT celestial mechanics  
 climate  
 closed ecological systems  
 cycles  
 durability

∞ effects

life (durability)  
 life support systems  
 orbit perturbation

∞ performance

periodic variations  
 perturbation  
 storage stability  
 time temperature parameter  
 weather

*Long Term Zonal Earth Energy Experiment*

USE **LZEEBE satellite**

**long wave radiation**

GS electromagnetic radiation  
 . radio waves

. . **long wave radiation**

RT far infrared radiation  
 monochromatic radiation

∞ radiation

short wave radiation  
 solar radiation  
 Surface Meteorology and Solar  
 Energy project  
 Surface Radiation Budget project

*long waves (meteorology)*

USE **planetary waves**

**longerons**

UF *astromasts*  
 GS structural members

. **longerons**

RT keels  
 reinforcement (structures)  
 ribs (supports)  
 strakes  
 stringers  
 structural stability

∞ **longevity**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT life (durability)  
 life span

**longitude**

DEF Angular distance, along a primary great circle, from the adopted reference point; the angle between a reference plane through the polar axis and a second plane through that axis.

GS **longitude**

. solar longitude

RT coordinates  
 geodetic coordinates  
 latitude  
 position (location)

**longitude measurement**

RT latitude measurement  
 ∞ measurement  
 navigation  
 positioning

**longitudinal control**

UF *pitch attitude control*

GS attitude control

. **longitudinal control**

RT aircraft control  
 altitude control  
 automatic control

∞ control

directional control  
 helicopter control  
 lateral control  
 manual control  
 missile control  
 pilot induced oscillation  
 pitch (inclination)  
 satellite attitude control  
 satellite control

**longitudinal stability**

GS dynamic characteristics  
 . dynamic stability  
 . . motion stability  
 . . . attitude stability  
 . . . . **longitudinal stability**  
 stability

. dynamic stability  
 . . motion stability  
 . . . attitude stability  
 . . . . **longitudinal stability**

RT aerodynamic stability  
 aircraft stability  
 directional stability  
 flow stability  
 hovering stability  
 lateral stability  
 pitch (inclination)  
 pitching moments  
 POGO effects  
 rotary stability  
 spacecraft stability

**longitudinal waves**

DEF Waves in which the direction of dis-

placement at each point of the medium is normal to the wave front.

GS **longitudinal waves**

. plane waves  
 RT beams (radiation)  
 dilatational waves  
 elastic waves  
 electrostatic waves  
 frequencies  
 normal shock waves

∞ radiation

seismic waves  
 shock waves  
 solar radiation  
 sound waves  
 transverse waves  
 wave packets  
 wavelengths

∞ waves

*longshore currents*

USE **coastal currents**

**look angles (electronics)**

DEF The solid angle in which an instrument operates effectively, generally used to describe radars, optical instruments, and space radiation detectors.

GS geometry

. Euclidean geometry  
 . . angles (geometry)

. . . **look angles (electronics)**

RT alignment  
 directivity  
 installing  
 instrument orientation  
 optical equipment  
 positioning  
 radar equipment

**look angles (tracking)**

DEF The elevation and azimuth at which a particular satellite is predicted to be found at a specified time.

GS geometry

. Euclidean geometry  
 . . angles (geometry)

. . . **look angles (tracking)**

RT azimuth  
 elevation angle  
 field of view

**loop antennas**

DEF Antennas whose configuration is that of a loop. If the current in the loop, or in the parallel turns of the loop is essentially uniform and the loop circumference is small compared with the wavelength, the radiation pattern approximates that of a magnetic dipole.

GS antennas

. directional antennas  
 . . **loop antennas**

RT aircraft antennas  
 loops  
 monopole antennas

**loop transfer functions**

(added September 1993)

GS functions (mathematics)  
 . transfer functions

. . **loop transfer functions**

RT control systems design  
 feedback control  
 loop transfer recovery

**loop transfer recovery**

(added September 1993)

DEF The recovery of the transfer properties of the controller in a feedback control system compensator design.

RT compensators  
 control stability  
 control systems design  
 control theory  
 error signals  
 feedback control  
 loop transfer functions  
 ∞ recovery

## loops

systems stability

### loops

GS

#### loops

. corrosion test loops

RT

circuits  
closed cycles  
loop antennas  
toruses  
trusses

LOR (*rendezvous*)

USE **lunar orbital rendezvous**

### LORAC navigation system

GS

navigation  
. radio navigation  
. . hyperbolic navigation  
. . . **LORAC navigation system**

RT

distance measuring equipment  
navigation aids  
navigation instruments  
surface navigation  
∞ systems

### loran

DEF A two dimensional pulse synchronized radio navigation system to determine hyperbolic lines of position through pulse time differencing from a master compared to two slave stations. Used for long range navigation.

UF *long range navigation*

GS

navigation  
. radio navigation  
. . hyperbolic navigation  
. . . **loran**

RT

air navigation  
Decca navigation  
distance measuring equipment  
navigation aids  
navigation instruments  
polar navigation  
solar compasses  
surface navigation  
surveys

### loran C

GS

navigation  
. radio navigation  
. . hyperbolic navigation  
. . . **loran**

RT

air navigation  
Decca navigation  
navigation aids

### loran D

GS

navigation  
. radio navigation  
. . hyperbolic navigation  
. . . **loran**

RT

air navigation  
Decca navigation  
navigation aids

### Lorentz contraction

UF *Fitzgerald-Lorentz contraction*

RT

relativity

### Lorentz force

DEF The force affecting a charged particle due to the motion of the particle in a magnetic field.

RT

charged particles  
∞ force  
magnetic fields  
ponderomotive forces

*Lorentz force accelerator thrusters*

(added April 2001)

USE **magnetoplasmadynamic thrusters**

### Lorentz gas

GS

gases  
. ionized gases  
. . **Lorentz gas**  
particles

. charged particles

. . ionized gases

. . . **Lorentz gas**

RT

gas dynamics  
kinetic theory

### Lorentz transformations

GS

functions (mathematics)

RT

. **Lorentz transformations**  
Dirac equation  
invariance  
Mandelstam representation

### LORV

USE

**low observable reentry vehicles**

### Los Alamos Molten Plutonium Reactor

GS

nuclear reactors  
. liquid cooled reactors  
. . liquid metal cooled reactors  
. . . **Los Alamos Molten Plutonium Reactor**  
. nuclear research and test reactors  
. . **Los Alamos Molten Plutonium Reactor**

*Los Alamos Turret Reactor*

USE

**high temperature nuclear reactors**

### Los Alamos Water Boiler Reactor

GS

nuclear reactors  
. liquid cooled reactors  
. . water cooled reactors  
. . . boiling water reactors  
. . . . **Los Alamos Water Boiler Reactor**

### loss of coolant

UF

*coolant loss*

GS

accidents  
. **loss of coolant**

RT

coolants  
leakage  
losses  
nuclear reactors  
reactor materials

### losses

GS

**losses**

RT

. dielectric loss  
auditory defects  
commerce  
damage  
depletion  
eddy currents  
energy dissipation  
impairment  
insertion loss  
leakage  
legal liability  
liabilities  
loss of coolant  
ohmic dissipation  
plasma loss  
seepage  
transmission loss  
wastes  
water loss  
yield

### lossless equipment

RT

lossless materials

### lossless materials

DEF Dielectric materials that do not dissipate energy or that do not dampen oscillations.

GS

dielectrics  
. **lossless materials**

RT

lossless equipment

∞ materials

### lossy media

DEF A material that dissipates electromagnetic or acoustic energy passing through it.

RT

electromagnetic wave transmission  
ionospheric propagation  
transmission loss

wave propagation

*lost wax process*

USE

**investment casting**

*LOTS cargo ships*

USE

**cargo ships**

### loudness

DEF The intensive attribute of an auditory sensation, in terms of which sounds may be ordered on a scale extending from soft to loud. Loudness is measured in sones. Loudness depends primarily upon the sound pressure of the stimulus, but it also depends upon the frequency and waveform of the stimulus.

RT

acoustics  
effective perceived noise levels  
flux density  
hearing  
∞ intensity  
level (quantity)  
noise (sound)  
noise measurement  
noise reduction  
power spectra  
sound intensity  
sound pressure  
sound waves

### loudspeakers

GS

audio equipment  
. **loudspeakers**  
transducers  
. sound transducers  
. . electroacoustic transducers  
. . . **loudspeakers**

RT

monaural signals  
radio receivers  
sound generators

### Louisiana

GS

nations  
. United States

. . **Louisiana**

RT

Atchafalaya River Basin (LA)  
Gulf of Mexico  
Lake Pontchartrain (LA)  
Mississippi Delta (LA)

### ∞ lounges

SN

(USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)

RT

mobile lounges  
rooms  
seats

### louvers

RT

apertures

baffles

∞

diffusers

∞

screening

shades

shielding

∞

shutters

slots

vents

### Love waves

DEF Surface waves having a horizontal motion that is shear or transverse to the direction of propagation. Their velocity depends only on density and rigidity and not on bulk modulus. They are named after A.E.H. Love, the English mathematician who discovered them.

GS

elastic waves

. seismic waves

. . **Love waves**

RT

surface waves

*low alloy steels*

USE

**high strength steels**

### low altitude

GS

altitude

. **low altitude**

RT

elevation  
lower atmosphere  
midaltitude  
nap-of-the-earth navigation

- terrain following
- low aspect ratio**  
GS ratios  
. aspect ratio  
. . **low aspect ratio**
- low aspect ratio wings**  
UF *diamond wings*  
GS airfoils  
. wings  
. . **low aspect ratio wings**  
. . . delta wings  
. . . trapezoidal wings  
RT cruciform wings  
fixed wings  
rigid wings  
wing planforms
- low carbon steels**  
DEF Iron alloys containing carbon in low percentages that display temper and malleability characteristics not found in ordinary carbon steels.  
GS alloys  
. iron alloys  
. . steels  
. . . carbon steels  
. . . . **low carbon steels**  
RT iron
- low concentrations**  
GS composition (property)  
. concentration (composition)  
. . **low concentrations**  
RT dilution
- low conductivity**  
RT electric current  
electrical resistivity  
transconductance
- low cost**  
GS costs  
. **low cost**  
RT economy
- low currents**  
GS electric current  
. **low currents**  
RT dark current  
low voltage  
plasma currents
- low density flow**  
GS fluid flow  
. **low density flow**  
RT  $\infty$  flow  
molecular flow  
rarefied gas dynamics  
rarefied gases
- low density gases*  
USE **rarefied gases**
- low density materials**  
RT absorbents  
absorbers (materials)  
foams  
granular materials  
honeycomb cores  
honeycomb structures  
light elements  
 $\infty$  materials  
polyurethane foam  
porous materials  
porous plates  
powder metallurgy
- low density research**  
GS research  
. **low density research**  
RT blowdown wind tunnels  
collisionless plasmas  
composite materials  
epoxy matrix composites  
nonuniform plasmas  
plasmas (physics)  
rarefied gases  
shock tubes  
shock tunnels
- shock wave luminescence  
ultrahigh vacuum  
vacuum apparatus
- low density wind tunnels**  
GS test facilities  
. wind tunnels  
. . **low density wind tunnels**  
RT hypersonic wind tunnels  
hypervelocity wind tunnels  
plasma jets  
rarefied gas dynamics  
shock tubes  
shock tunnels  
slip flow  
supersonic wind tunnels
- low Earth orbital environments*  
USE **Earth orbital environments**
- low Earth orbits**  
(added April 1995)  
DEF Nominally circular Earth orbits of low altitude (typically between 100 and 1,000 km.) and short periodicity.  
UF **LEO**  
GS orbits  
. Earth orbits  
. . **low Earth orbits**  
RT Earth orbital environments  
elliptical orbits  
interplanetary transfer orbits  
NPOESS  
parking orbits  
polar orbits  
remote sensing  
satellite orbits
- low frequencies**  
SN (30 TO 300 KHZ)  
GS frequencies  
. radio frequencies  
. . **low frequencies**  
. . . very low frequencies  
RT  $\infty$  bands  
extremely low frequencies  
high frequencies  
intermediate frequencies  
ultrahigh frequencies  
very high frequencies
- low frequency transionospheric satellites**  
UF *LOFTI satellites*  
GS artificial satellites  
. communication satellites  
. . **low frequency transionospheric satellites**
- low gravity*  
USE **microgravity**
- low gravity manufacturing**  
GS manufacturing  
. **low gravity manufacturing**  
RT containerless melts  
drop towers  
fabrication  
levitation melting  
liquid bridges  
Marangoni convection  
metal foams  
microgravity  
 $\infty$  microgravity applications  
space manufacturing  
space processing  
space tools  
technologies
- Low Intensity X Ray Imaging Scopes*  
USE **lixiscopes**
- low latitudes*  
USE **tropical regions**
- low level turbulence**  
GS turbulence  
. atmospheric turbulence  
. . **low level turbulence**
- RT homogeneous turbulence
- low mass*  
USE **mass**
- low molecular weights**  
GS molecular properties  
. molecular weight  
. . **low molecular weights**  
RT diatomic molecules  
molecules  
monatomic molecules  
weight (mass)
- low noise**  
RT preamplifiers  
signal to noise ratios
- low observable reentry vehicles**  
UF *LORV*  
GS reentry vehicles  
. **low observable reentry vehicles**  
RT radar cross sections  
reentry  
reentry physics  
 $\infty$  vehicles
- low pass filters**  
DEF Wave filters having a single transmission band extending from zero frequency up to some critical or bounding frequency, not infinite.  
RT bandstop filters  
electric filters  
electromagnetic wave filters  
 $\infty$  filters  
Gabor filters  
microwave filters  
optical filters
- low pressure**  
GS pressure  
. **low pressure**  
. . high altitude pressure  
RT altitude tolerance  
cyclogenesis  
cyclones  
 $\infty$  depression  
high altitude environments  
high pressure  
hypobaric atmospheres  
troughs  
vacuum
- low pressure chambers*  
USE **vacuum chambers**
- $\infty$  **low resistance**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT chemical properties  
electrical resistance  
flow resistance  
mechanical properties  
 $\infty$  resistance  
thermal resistance  
transconductance
- low Reynolds number**  
SN (RN BELOW 2,000)  
DEF A Reynolds number below the critical Reynolds number of a sphere.  
GS dimensionless numbers  
. Reynolds number  
. . **low Reynolds number**  
ratios  
. Reynolds number  
. . **low Reynolds number**  
RT direct numerical simulation  
high Reynolds number  
laminar flow  
viscosity
- low speed**  
UF *low velocity*  
GS rates (per time)  
. **low speed**  
velocity  
. **low speed**  
RT airspeed  
flow velocity

## low speed stability

ground speed  
landing speed  
subsonic speed

### low speed stability

GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . **low speed stability**  
stability  
. dynamic stability  
. . motion stability  
. . . **low speed stability**  
RT aerodynamic stability  
aerodynamic stalling  
aircraft stability  
attitude stability  
controllability  
dynamic tests  
flight characteristics  
flow stability  
hovering stability  
spacecraft stability

### low speed wind tunnels

GS test facilities  
. wind tunnels  
. . **low speed wind tunnels**  
. . . subsonic wind tunnels  
RT blowdown wind tunnels

### low temperature

GS temperature  
. **low temperature**  
. . cryogenic temperature  
RT bay ice  
cooling  
cryogenics  
freezing  
frost  
frost damage  
ice formation  
magnetic cooling  
pressure ice  
refrigerating

### low temperature brazing

GS welding  
. fusion welding  
. . gas welding  
. . . brazing  
. . . . **low temperature brazing**  
RT soldering

### low temperature environments

GS environments  
. **low temperature environments**  
RT cold strength  
cold weather  
high altitude environments  
lunar temperature  
magnetic cooling  
mountain inhabitants  
thermal environments

### low temperature physics

RT cryochemistry  
cryogenics  
high temperature superconductors  
Kondo effect  
 $\infty$  physics  
 $\infty$  science  
solidified gases  
superconducting power transmission  
superconductivity  
YBCO superconductors

### low temperature plasmas

USE **cold plasmas**

### low temperature tests

GS environmental tests  
. **low temperature tests**  
RT chemical tests  
cold strength  
cold weather tests  
cryostats  
hardness tests  
lubricant tests  
melting points

nondestructive tests  
quality control  
temperature control  
 $\infty$  tests  
thermal expansion  
thermal stability

### low thrust

GS thrust  
. **low thrust**  
. . microthrust  
RT high thrust  
jet thrust  
rocket thrust  
variable thrust

### low thrust propulsion

GS propulsion  
. **low thrust propulsion**  
. . electromagnetic propulsion  
. . . magnetic sails  
. . . electrostatic propulsion  
. . . ion propulsion  
. . man operated propulsion systems  
. . photonic propulsion  
. . . laser propulsion  
. . plasma propulsion  
. . solar propulsion  
. . . solar electric propulsion  
. . . solar thermal propulsion  
RT electric propulsion  
microthrust  
rocket thrust  
space station propulsion  
spacecraft propulsion  
variable thrust

### low turbulence

GS turbulence  
. **low turbulence**  
RT steady flow

### low vacuum

SN (PRESSURES BETWEEN 3. 001 AND 1. 0 TORR)  
DEF The condition in a gas filled space at pressures less than 760 torr corresponding approximately to the vapor pressure of water at 25 deg. C and to 1 inch of mercury.  
GS pressure  
. vacuum  
. . **low vacuum**  
RT high vacuum

### low velocity

USE **low speed**

### low visibility

GS visibility  
. **low visibility**  
RT aircraft landing  
all-weather landing systems  
hazards  
haze  
instrument flight rules  
light transmission

### low voltage

GS potential energy  
. electric potential  
. . **low voltage**  
RT low currents

### low volume ramjet engines

GS engines  
. air breathing engines  
. . gas turbine engines  
. . . jet engines  
. . . . ramjet engines  
. . . . . **low volume ramjet engines**  
. . internal combustion engines  
. . gas turbine engines  
. . . jet engines  
. . . . ramjet engines  
. . . . . **low volume ramjet engines**  
. turbine engines  
. . gas turbine engines  
. . . jet engines  
. . . . ramjet engines

. . . . . **low volume ramjet engines**

### low weight

RT gravitation  
microgravity  
weightlessness

### $\infty$ low wing aircraft

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT  $\infty$  aircraft  
aircraft configurations  
Beech 99 aircraft  
general aviation aircraft  
hypersonic aircraft  
jet aircraft  
light aircraft  
monoplanes  
passenger aircraft  
tailless aircraft  
transport aircraft  
turbofan aircraft  
turboprop aircraft

### lower atmosphere

SN (ALTITUDE BELOW ABOUT 50 KM)  
DEF Generally, and quite loosely, that part of the atmosphere in which most weather phenomena occur (i.e., the troposphere and lower stratosphere); hence, used in contrast to the common meaning for the upper atmosphere.  
GS Earth atmosphere  
. **lower atmosphere**  
. . troposphere  
. . . tropopause  
RT biosphere  
chemosphere  
heterosphere  
homosphere  
Intasat satellite  
LACATE (experiment)  
low altitude  
mesometeorology  
middle atmosphere

### Lower Atmospheric Composition Experiment

USE **LACATE (experiment)**

### lower body negative pressure

DEF Application and/or measurement of reduced pressure in the portion of the body below the iliac crests. Used as a simulator or orthostatic stress or as an indicator of cardiovascular deconditioning in a weightless environment.  
GS hemodynamics  
. **lower body negative pressure**  
pressure  
. blood pressure  
. . **lower body negative pressure**  
RT acceleration stresses (physiology)  
artificial gravity  
cardiovascular system  
fluid shifts (biology)  
gravitational effects  
head up tilt  
orthostatic tolerance  
space flight stress  
stress (physiology)  
tilt-table test  
weightlessness

### Lower California (Mexico)

UF *Baja California*  
RT Mexico  
North America

### lower ionosphere

GS Earth atmosphere  
. upper atmosphere  
. . Earth ionosphere  
. . . **lower ionosphere**  
. . . . D region

RT E region

*LOX (oxygen)*  
USE **liquid oxygen**

*LOX-hydrocarbon rocket engines*  
USE **oxygen-hydrocarbon rocket engines**

*LOX-hydrogen engines*  
USE **hydrogen oxygen engines**

*LPTR Reactor*  
USE **Livermore Pool Type Reactor**

*LQG control*  
USE **linear quadratic Gaussian control**

*LQR*  
USE **linear quadratic regulator**

*LR circuits*  
USE **RL circuits**

**LR-62-RM-2 engine**  
GS engines  
. rocket engines  
. liquid propellant rocket engines  
. . . **LR-62-RM-2 engine**  
RT Bullpup missiles

**LR-87-AJ-5 engine**  
GS engines  
. rocket engines  
. booster rocket engines  
. . . **LR-87-AJ-5 engine**  
. liquid propellant rocket engines  
. . . **LR-87-AJ-5 engine**  
RT Titan 1 ICBM

**LR-91-AJ-5 engine**  
GS engines  
. rocket engines  
. liquid propellant rocket engines  
. . . **LR-91-AJ-5 engine**  
RT Titan ICBM

*LRC circuits*  
USE **RLC circuits**

*LRV (vehicle)*  
USE **lunar roving vehicles**

**L-Sat**  
DEF A communications satellite designed by European Space Agency member states to meet future communications satellite market needs such as European broadcast services, global telecommunications trunk services, and mobile services. Used for European Large Telecomm Satellite.  
UF *European Large Telecomm Satellite*  
GS artificial satellites  
. communication satellites  
. . . **L-Sat**  
. ESA satellites  
. . . **L-Sat**  
ESA spacecraft  
. ESA satellites  
. . . **L-Sat**  
RT satellite networks

*LSI*  
USE **large scale integration**

*LSS (cosmology)*  
(added May 2002)  
USE **large-scale structure of the universe**

**LSSM**  
UF *Lunar Surface Scientific Modules*  
GS lunar spacecraft  
. lunar landing modules  
. Lunar Module  
. . . **LSSM**  
manned spacecraft  
. Lunar Module  
. . . **LSSM**  
modules  
. spacecraft modules

. . landing modules  
. . . lunar landing modules  
. . . . Lunar Module  
. . . . **LSSM**  
soft landing spacecraft  
. landing modules  
. lunar landing modules  
. . . Lunar Module  
. . . . **LSSM**  
spacecraft components  
. spacecraft modules  
. landing modules  
. . lunar landing modules  
. . . Lunar Module  
. . . . **LSSM**  
Apollo project  
lunar laboratories  
∞ surfaces

RT

*LST*  
USE **Hubble Space Telescope**

*LTE (astronomy)*  
USE **local thermodynamic equilibrium**

*LTV aircraft*  
USE **Ling-Temco-Vought aircraft**

**lubricant tests**  
RT engine tests  
high temperature tests  
low temperature tests  
∞ materials tests  
∞ tests  
tribometers  
wear resistance

**lubricants**  
DEF Substances interposed between two surfaces for the purpose of reducing the friction or wear between them.  
GS **lubricants**  
. gas lubricants  
. high temperature lubricants  
. lubricating oils  
. solid lubricants  
RT additives  
boundary lubrication  
graphite  
greases  
kerogen  
liquid metals  
lubrication  
lubrication systems  
maintenance  
oils  
petroleum products  
squeeze films

**lubricating oils**  
GS lubricants  
. **lubricating oils**  
oils  
. **lubricating oils**  
RT detergents  
lubrication  
mineral oils  
petroleum products  
shale oil

**lubrication**  
GS **lubrication**  
. boundary lubrication  
. self lubrication  
. spacecraft lubrication  
. vapor phase lubrication  
RT bearings  
elastohydrodynamics  
engines  
friction reduction  
gears  
impregnating  
liquid bearings  
lubricants  
lubricating oils  
lubrication systems  
maintenance  
self lubricating materials  
sliding

tribology

**lubrication systems**  
RT automobiles  
cooling systems  
internal combustion engines  
lubricants  
lubrication  
pumps  
∞ systems  
vapor phase lubrication

*Lucite (trademark)*  
USE **polymethyl methacrylate**

*Luder bands*  
USE **plastic deformation yield point**

**Ludox (trademark)**  
DEF Composite material utilizing colloidal silica matrixes.  
GS refractory materials  
. **Ludox (trademark)**  
RT densification  
heat shielding  
reentry shielding  
spacecraft construction materials  
thermal protection tiles

**lugs**  
RT fasteners  
holders  
studs (structural members)  
supports

**lumbar region**  
GS anatomy  
. **lumbar region**  
regions  
. **lumbar region**  
RT human body  
sciatic region

*lumbering areas*  
USE **forests**

**lumens**  
DEF Units of luminous flux equal to the luminous flux radiated into a unit solid angle (steradian) from a point source having a luminous intensity of 1 candela.  
GS pressure  
. radiation pressure  
. . **lumens**  
rates (per time)  
. flux density  
. . radiant flux density  
. . . **lumens**  
RT light (visible radiation)  
luminance  
luminescence  
luminosity  
optical properties  
radiance

**luminaires**  
UF *electroluminescent lamps lamps light bulbs lights*  
GS lighting equipment  
. **luminaires**  
. aircraft lights  
. airport lights  
. . runway lights  
. arc lamps  
. flash lamps  
. . alkali vapor lamps  
. mercury lamps  
. quartz lamps  
. searchlights  
. xenon lamps  
RT ballasts (impedances)  
bulbs  
fixtures  
∞ flares  
∞ globes  
illuminating

## luminance

light (visible radiation)  
light sources  
projectors  
visual signals

### luminance

SN (LIMITED TO EMISSION RATE PER UNIT AREA OF VISIBLE RADIATION)

DEF In photometry, a measure of the intrinsic luminous intensity emitted by a source in a given direction; the illuminance produced by light from the source upon a unit surface area oriented normal to the line of sight at any distance from the source, divided by the solid angle subtended by the source at the receiving surface. Also called brightness but luminance is preferred.

GS pressure  
. radiation pressure  
. . luminous intensity  
. . . **luminance**  
rates (per time)  
. flux density  
. . radiant flux density  
. . . luminous intensity  
. . . . **luminance**

RT brightness  
glare  
illuminance  
illuminating  
∞ intensity  
irradiance  
light (visible radiation)  
lumens  
optical properties  
photometry  
sky brightness  
solar flux density  
stellar magnitude

### luminescence

DEF Light emission by a process in which kinetic heat energy is not essential for the mechanism of excitation. Used for glow and noctilucence.

UF *glow*  
*noctilucence*

GS emission  
. light emission  
. . **luminescence**  
. . . bioluminescence  
. . . cathode glow  
. . . cathodoluminescence  
. . . chemiluminescence  
. . . electroluminescence  
. . . fluorescence  
. . . . laser induced fluorescence  
. . . . phosphorescence  
. . . . resonance fluorescence  
. . . . x ray fluorescence  
. . . lunar luminescence  
. . . optical resonance  
. . . photoluminescence  
. . . triboluminescence  
. . . . x ray fluorescence  
. . . shock wave luminescence  
. . . sonoluminescence  
. . . spacecraft glow  
. . . thermoluminescence

RT afterglows  
alkali vapor lamps  
brightness  
electron-hole drops  
Fraunhofer line discriminators  
∞ illumination  
illuminators  
incandescence  
light (visible radiation)  
light emitting diodes  
lumens  
luminosity  
luminous intensity  
noctilucence clouds  
optical transition  
plasma radiation  
stellar luminosity  
Stokes law of radiation  
temperature sensitive paints

visibility

*luminescent intensity*  
USE **luminous intensity**

### luminescent proteins

(added August 2004)

DEF Proteins which are involved in the phenomenon of light emission in living systems. Included are the "enzymatic" and "non-enzymatic" types of system with or without the presence of oxygen or co-factors.

GS biopolymers  
. proteins  
. . **luminescent proteins**  
organic compounds  
. proteins  
. . **luminescent proteins**

RT bioluminescence

### luminosity

GS electromagnetic properties  
. optical properties  
. . **luminosity**  
. . . stellar luminosity

RT brightness  
emissivity  
emittance  
illuminance  
incandescence  
light (visible radiation)  
lumens  
luminescence  
mass to light ratios  
phosphene  
radiance  
radiant flux density  
Tully-Fisher relation  
visibility

*luminous flux density*

USE **luminous intensity**

### luminous intensity

SN (LIMITED TO EMISSION OR DETECTION RATE PER UNIT AREA OF VISIBLE RADIATION)

DEF Luminous energy per unit time per unit solid angle; the intensity (flux per unit solid angle) of visible radiation weighted to take into account the variable response of the human eye as a function of the wavelength of light; usually expressed in candles. Used for light intensity, luminescent intensity, and luminous flux density.

UF *light intensity*  
*luminescent intensity*  
*luminous flux density*

GS pressure  
. radiation pressure  
. . **luminous intensity**  
. . . illuminance  
. . . luminance  
rates (per time)  
. flux density  
. . radiant flux density  
. . . **luminous intensity**  
. . . . illuminance  
. . . . luminance

RT BL Lacertae objects  
brightness  
emittance  
flux (rate)  
incandescence  
∞ intensity  
irradiance  
light (visible radiation)  
luminescence  
mass to light ratios  
radiance  
Seyfert galaxies  
solar flux density  
stellar magnitude

### lumped parameter systems

DEF Systems in which the parameters may be considered to represent, for purposes of analysis, a single inductance, capacitance, resistance, etc., throughout the frequency range of interest.

RT lumping  
mathematical models

matrices (mathematics)  
∞ systems

### lumping

RT agglomeration  
coagulation  
collection  
composition (property)  
lumped parameter systems

*LUNA lunar probes*

USE **Lunik lunar probes**

### lunar albedo

GS albedo  
. **lunar albedo**

RT absorptance  
cosmic ray albedo  
Earth albedo  
optical properties  
surface properties

### lunar atmosphere

UF *lunar ionosphere*

GS environments  
. extraterrestrial environments  
. . lunar environment  
. . . **lunar atmosphere**  
. . . satellite atmospheres  
. . . . **lunar atmosphere**

RT moon  
planetary atmospheres

### lunar based equipment

(added December 1990)

GS **lunar based equipment**  
. lunar construction equipment  
. lunar excavation equipment  
. lunar retroreflectors

RT ∞ equipment  
lunar bases  
lunar flying vehicles  
lunar laboratories  
lunar logistics  
lunar mining  
lunar shelters  
lunar surface vehicles

### lunar bases

GS space bases  
. **lunar bases**

RT AEPS  
Altair Lunar Lander  
∞ astronautics  
∞ bases  
lunar based equipment  
lunar construction equipment  
lunar laboratories  
lunar mining  
Mars bases  
moon  
orbiting lunar stations  
space colonies  
stations  
terraforming

*lunar cinematography*

USE **lunar photography**

### lunar communication

GS telecommunication  
. space communication  
. . **lunar communication**  
. . . circumlunar communication

RT facsimile communication  
interplanetary communication  
lasers  
moon  
optical communication  
radar  
radio communication  
satellite communication  
spacecraft communication

### lunar composition

GS composition (property)  
. **lunar composition**

RT lunar core  
Lunar Prospector  
moon

pre-Imbrian period  
selenology  
siderophile elements

**lunar construction equipment**

(added December 1990)

GS lunar based equipment

. **lunar construction equipment**

RT lunar bases  
lunar excavation equipment  
lunar shelters  
lunar surface vehicles

**lunar core**

GS cores

. **lunar core**

RT lunar composition  
lunar geology  
planetary cores  
selenology

*Lunar Crater Observation and Sensing Satellite*

(added December 2009)

USE **LCROSS (satellite)**

**lunar craters**

DEF A depression, usually circular, on the surface of the moon, usually with a raised rim called a ringwall.

GS craters

. **lunar craters**

. . Ptolemaeus Crater

. . Tycho crater

RT LCROSS (satellite)  
meteorite craters  
moon  
pre-Imbrian period  
selenography  
selenology

**lunar crust**

GS crusts

. **lunar crust**

RT Earth crust  
moon  
planetary crusts  
selenography  
selenology

**lunar dust**

GS particles

. dust

. . **lunar dust**

soils

. lunar soil

. . **lunar dust**

RT moon  
selenology

**lunar echoes**

GS echoes

. **lunar echoes**

. . lunar radar echoes

RT radio echoes  
selenology

**lunar eclipses**

DEF The phenomenon observed when the moon enters the shadow of the Earth.

GS eclipses

. **lunar eclipses**

RT moon  
selenology

**lunar effects**

UF *lunar perturbation*

GS **lunar effects**

. lunar gravitational effects

. lunar tides

RT ∞ effects  
orbit perturbation  
selenology

**lunar environment**

GS environments

. extraterrestrial environments

. . **lunar environment**

. . . lunar atmosphere

RT aerospace environments

bioastronautics  
exobiology  
life support systems  
Lunar Reconnaissance Orbiter  
moon  
planetary environments  
selenology  
terraforming  
thermal environments

**lunar equator**

GS equators

. **lunar equator**

RT infrared imagery  
radar imagery  
selenology

**lunar escape devices**

RT escape capsules  
escape rockets

**lunar evolution**

GS evolution (development)

. **lunar evolution**

RT GRAIL mission  
moon  
pre-Imbrian period  
selenology  
solar system evolution

**lunar excavation equipment**

(added December 1990)

GS lunar based equipment

. **lunar excavation equipment**

RT ∞ equipment  
excavation  
lunar construction equipment  
lunar mining  
lunar resources  
lunar surface vehicles  
tractors

**lunar exploration**

GS exploration

. space exploration

. . **lunar exploration**

RT Altair Lunar Lander  
Apollo 5 flight  
Apollo 6 flight  
Apollo 7 flight  
Apollo 8 flight  
Apollo 9 flight  
Apollo 10 flight  
Apollo 11 flight  
Apollo 12 flight  
Apollo 13 flight  
Apollo 14 flight  
Apollo 15 flight  
Apollo 16 flight  
Apollo 17 flight  
Apollo lunar experiment module  
Apollo Lunar Surface Experiments Package  
Apollo project  
Clementine spacecraft  
Crew Exploration Vehicle  
EASEP  
extraterrestrial resources  
LCROSS (satellite)  
local scientific survey module  
Lunar Prospector  
Lunar Reconnaissance Orbiter  
lunar resources  
Mars exploration  
moon  
selenology

**Lunar Exploration System for Apollo**

UF *LESA (lunar exploration system)*

RT Apollo 5 flight  
Apollo 6 flight  
Apollo 7 flight  
Apollo 8 flight  
Apollo 9 flight  
Apollo 10 flight  
Apollo 11 flight  
Apollo 12 flight  
Apollo 13 flight  
Apollo 14 flight  
Apollo 15 flight

Apollo 16 flight  
Apollo 17 flight  
Apollo project  
∞ systems

**lunar far side**

RT libration  
moon  
selenology

**lunar figure**

RT selenology

**lunar flight**

GS space flight  
. **lunar flight**  
RT Apollo 5 flight  
Apollo 6 flight  
Apollo 7 flight  
Apollo 8 flight  
Apollo 9 flight  
Apollo 10 flight  
Apollo 11 flight  
Apollo 12 flight  
Apollo 13 flight  
Apollo 14 flight  
Apollo 15 flight  
Apollo 16 flight  
Apollo 17 flight  
circumlunar trajectories  
cislunar space  
Earth-Moon trajectories  
∞ flight  
flyby missions  
moon-Earth trajectories  
orbits

**lunar flying vehicles**

RT ∞ flight vehicles  
lifting bodies  
lunar based equipment  
∞ vehicles

**lunar geology**

DEF The science that applies geologic principles and techniques to the study of the moon, especially its composition and the origin of its surface features.

GS geology

. **lunar geology**

RT geomorphology  
GRAIL mission  
lunar core  
lunar maria  
lunar seismographs  
moon  
moonquakes  
planetary geology  
pre-Imbrian period  
regolith  
seismology  
selenology

**lunar gravitation**

GS gravitation

. **lunar gravitation**

RT GRAIL mission  
moon  
planetary gravitation  
selenology

**lunar gravitational effects**

GS gravitational effects  
. **lunar gravitational effects**  
lunar effects  
. **lunar gravitational effects**  
RT ∞ effects  
selenology

**Lunar Gravity Simulator**

GS simulators  
. environment simulators  
. . **Lunar Gravity Simulator**  
RT gravitation

*lunar ionosphere*

USE **lunar atmosphere**

**lunar laboratories**

(added April 1993)



## lunar landing

GS laboratories  
  . **lunar laboratories**  
  . . lunar receiving laboratory  
RT LSSM  
  lunar based equipment  
  lunar bases  
  lunar observatories  
  space laboratories

### lunar landing

GS landing  
  . spacecraft landing  
  . . **lunar landing**  
RT Altair Lunar Lander  
  Apollo 5 flight  
  Apollo 6 flight  
  Apollo 7 flight  
  Apollo 8 flight  
  Apollo 9 flight  
  Apollo 10 flight  
  Apollo 11 flight  
  Apollo 12 flight  
  Apollo 13 flight  
  Apollo 14 flight  
  Apollo 15 flight  
  Apollo 16 flight  
  Apollo 17 flight  
  Apollo lunar experiment module  
  crash landing  
  hard landing  
  planetary landing  
  soft landing  
  Surveyor project

### lunar landing modules

GS lunar spacecraft  
  . **lunar landing modules**  
  . . Lunar Module  
  . . . Apollo lunar experiment module  
  . . . LSSM  
  . . . Lunar Module 5  
  . . . Lunar Module 7  
  . . Altair Lunar Lander  
  modules  
  . spacecraft modules  
  . . landing modules  
  . . . **lunar landing modules**  
  . . . . Lunar Module  
  . . . . . Apollo lunar experiment  
  . . . . . module  
  . . . . . LSSM  
  . . . . . Lunar Module 5  
  . . . . . Lunar Module 7  
  . . . . . Altair Lunar Lander  
  soft landing spacecraft  
  . landing modules  
  . . **lunar landing modules**  
  . . . Lunar Module  
  . . . . Apollo lunar experiment  
  . . . . . module  
  . . . . . LSSM  
  . . . . . Lunar Module 5  
  . . . . . Lunar Module 7  
  . . . . . Altair Lunar Lander  
  spacecraft components  
  . spacecraft modules  
  . . landing modules  
  . . . **lunar landing modules**  
  . . . . Lunar Module  
  . . . . . Apollo lunar experiment  
  . . . . . module  
  . . . . . LSSM  
  . . . . . Lunar Module 5  
  . . . . . Lunar Module 7  
  . . . . . Altair Lunar Lander  
RT Apollo extension system  
  maneuverable spacecraft  
  manned spacecraft  
  reusable spacecraft  
  unmanned spacecraft

### lunar landing sites

GS sites  
  . landing sites  
  . . **lunar landing sites**  
RT Lunar Reconnaissance Orbiter  
  moon

selenography

*lunar laser ranging*  
(added July 2001)  
USE **laser ranging**  
**lunar rangefinding**

### lunar launch

GS launching  
  . rocket launching  
  . . **lunar launch**  
RT Apollo 5 flight  
  Apollo 6 flight  
  Apollo 7 flight  
  Apollo 8 flight  
  Apollo 9 flight  
  Apollo 10 flight  
  Apollo 11 flight  
  Apollo 12 flight  
  Apollo 13 flight  
  Apollo 14 flight  
  Apollo 15 flight  
  Apollo 16 flight  
  Apollo 17 flight  
  orbital launching  
  Saturn project

### lunar limb

RT libration  
  ∞ limbs  
  moon  
  planetary limb  
  selenology

### lunar logistics

GS logistics  
  . **lunar logistics**  
RT Altair Lunar Lander  
  life support systems  
  lunar based equipment  
  manned lunar surface vehicles  
  materials handling

### lunar luminescence

GS emission  
  . light emission  
  . . luminescence  
  . . . **lunar luminescence**  
RT moon  
  selenology

### lunar magnetic fields

GS magnetic fields  
  . **lunar magnetic fields**  
RT moon  
  selenology

### lunar mantle

RT core-mantle boundary  
  crusts  
  Earth mantle  
  GRAIL mission  
  planetary mantles  
  planetary structure  
  regolith  
  selenology

### lunar maps

GS maps  
  . **lunar maps**  
RT astronomical maps  
  Clementine spacecraft  
  moon  
  selenography

### lunar maria

GS maria  
  . **lunar maria**  
RT basalt  
  lunar geology  
  lunar rocks  
  selenology

### lunar mining

(added December 1990)  
GS mining  
  . **lunar mining**  
RT lunar based equipment  
  lunar bases  
  lunar excavation equipment

lunar resources  
  lunar rocks  
  lunar soil  
  mineral deposits  
  mines (excavations)  
  space commercialization  
  space industrialization  
  strip mining

### lunar mobile laboratories

UF *MOLABS*  
GS laboratories  
  . **lunar mobile laboratories**  
  surface vehicles  
  . lunar surface vehicles  
  . . **lunar mobile laboratories**  
RT Apollo project  
  manned lunar surface vehicles  
  selenography

### Lunar Module

UF *LEM (lunar module)*  
GS lunar spacecraft  
  . lunar landing modules  
  . . **Lunar Module**  
  . . . Apollo lunar experiment module  
  . . . LSSM  
  . . . Lunar Module 5  
  . . . Lunar Module 7  
  manned spacecraft  
  . **Lunar Module**  
  . . Apollo lunar experiment module  
  . . LSSM  
  . . Lunar Module 5  
  . . Lunar Module 7  
  modules  
  . spacecraft modules  
  . . landing modules  
  . . . lunar landing modules  
  . . . . **Lunar Module**  
  . . . . . Apollo lunar experiment  
  . . . . . module  
  . . . . . LSSM  
  . . . . . Lunar Module 5  
  . . . . . Lunar Module 7  
  soft landing spacecraft  
  . landing modules  
  . . lunar landing modules  
  . . . **Lunar Module**  
  . . . . Apollo lunar experiment module  
  . . . . LSSM  
  . . . . Lunar Module 5  
  . . . . Lunar Module 7  
  spacecraft components  
  . spacecraft modules  
  . . landing modules  
  . . . lunar landing modules  
  . . . . **Lunar Module**  
  . . . . . Apollo lunar experiment  
  . . . . . module  
  . . . . . LSSM  
  . . . . . Lunar Module 5  
  . . . . . Lunar Module 7  
RT Apollo 5 flight  
  Apollo 6 flight  
  Apollo 7 flight  
  Apollo 8 flight  
  Apollo 9 flight  
  Apollo 10 flight  
  Apollo 11 flight  
  Apollo 12 flight  
  Apollo 13 flight  
  Apollo 14 flight  
  Apollo 15 flight  
  Apollo 16 flight  
  Apollo 17 flight  
  Apollo spacecraft  
  ascent propulsion systems

### Lunar Module 5

GS lunar spacecraft  
  . lunar landing modules  
  . . Lunar Module  
  . . . **Lunar Module 5**  
  manned spacecraft  
  . Lunar Module  
  . . **Lunar Module 5**  
  modules  
  . spacecraft modules  
  . . landing modules

- . . . lunar landing modules
  - . . . . Lunar Module
  - . . . . **Lunar Module 5**
- soft landing spacecraft
  - . landing modules
  - . . lunar landing modules
  - . . . Lunar Module
  - . . . . **Lunar Module 5**
- spacecraft components
  - . spacecraft modules
  - . . landing modules
  - . . . lunar landing modules
  - . . . . Lunar Module
  - . . . . . **Lunar Module 5**
- RT Apollo spacecraft
- Lunar Module 7**
  - GS lunar spacecraft
    - . lunar landing modules
    - . . Lunar Module
    - . . . **Lunar Module 7**
  - manned spacecraft
    - . Lunar Module
    - . . **Lunar Module 7**
  - modules
    - . spacecraft modules
    - . . landing modules
    - . . . lunar landing modules
    - . . . . Lunar Module
    - . . . . . **Lunar Module 7**
  - soft landing spacecraft
    - . landing modules
    - . . lunar landing modules
    - . . . Lunar Module
    - . . . . **Lunar Module 7**
  - spacecraft components
    - . spacecraft modules
    - . . landing modules
    - . . . lunar landing modules
    - . . . . Lunar Module
    - . . . . . **Lunar Module 7**
  - RT Apollo spacecraft
- Lunar Module Ascent Stage**
  - RT ascent
    - ascent trajectories
    - rocket engines
    - stage separation
- lunar observatories**
  - GS observatories
    - . **lunar observatories**
  - RT astronomical observatories
    - lunar laboratories
- lunar occultation**
  - GS occultation
    - . **lunar occultation**
    - . . solar eclipses
  - RT Exosat satellite
    - moon
    - selenology
    - stellar occultation
- lunar orbit and landing simulators**
  - UF *LOLA (simulator)*
  - GS simulators
    - . **lunar orbit and landing simulators**
  - RT flight simulators
    - training simulators
- lunar orbital rendezvous**
  - UF *LOR (rendezvous)*
  - GS maneuvers
    - . orbital maneuvers
    - . . orbital rendezvous
    - . . . **lunar orbital rendezvous**
  - rendezvous
    - . space rendezvous
    - . . orbital rendezvous
    - . . . **lunar orbital rendezvous**
  - RT Earth orbital rendezvous
    - orbital mechanics
    - spacecraft trajectories
- Lunar Orbiter**
  - GS artificial satellites
    - . lunar satellites
    - . . **Lunar Orbiter**
    - . . . Lunar Orbiter 1
- . . . Lunar Orbiter 2
- . . . Lunar Orbiter 3
- . . . Lunar Orbiter 4
- . . . Lunar Orbiter 5
- lunar spacecraft
  - . lunar satellites
  - . . **Lunar Orbiter**
  - . . . Lunar Orbiter 1
  - . . . Lunar Orbiter 2
  - . . . Lunar Orbiter 3
  - . . . Lunar Orbiter 4
  - . . . Lunar Orbiter 5
- Lunar Orbiter 1**
  - UF *Lunar Orbiter A*
  - GS artificial satellites
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 1**
  - lunar spacecraft
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 1**
- Lunar Orbiter 2**
  - UF *Lunar Orbiter B*
  - GS artificial satellites
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 2**
  - lunar spacecraft
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 2**
- Lunar Orbiter 3**
  - UF *Lunar Orbiter C*
  - GS artificial satellites
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 3**
  - lunar spacecraft
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 3**
- Lunar Orbiter 4**
  - UF *Lunar Orbiter D*
  - GS artificial satellites
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 4**
  - lunar spacecraft
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 4**
- Lunar Orbiter 5**
  - UF *Lunar Orbiter E*
  - GS artificial satellites
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 5**
  - lunar spacecraft
    - . lunar satellites
    - . . Lunar Orbiter
    - . . . **Lunar Orbiter 5**
- Lunar Orbiter A*
  - USE **Lunar Orbiter 1**
- Lunar Orbiter B*
  - USE **Lunar Orbiter 2**
- Lunar Orbiter C*
  - USE **Lunar Orbiter 3**
- Lunar Orbiter D*
  - USE **Lunar Orbiter 4**
- Lunar Orbiter E*
  - USE **Lunar Orbiter 5**
- lunar orbits**
  - UF *evection*
  - GS orbits
    - . **lunar orbits**
  - RT artificial satellites
    - artificial satellites
    - circular orbits
    - circumlunar trajectories
    - cislunar space
- command service modules
- Earth orbits
- Earth-Moon trajectories
- elliptical orbits
- equatorial orbits
- Lissajous figures
- moon
- orbital mechanics
- parking orbits
- perilunes
- polar orbits
- satellite orbits
- spacecraft orbits
- transfer orbits
- lunar perturbation*
- USE **lunar effects**
- lunar phases**
  - RT moon
    - ∞ phases
    - selenology
    - terminator lines
- lunar photographs**
  - GS photographs
    - . **lunar photographs**
  - RT astronomical photography
    - photography
    - Ranger project
    - spaceborne photography
- lunar photography**
  - UF *lunar cinematography*
  - GS imagery
    - . photography
    - . . **lunar photography**
  - RT astronomical photography
    - black and white photography
    - infrared photography
    - moon
    - Ranger project
    - spaceborne photography
- lunar probes**
  - DEF Probes for exploring and reporting on conditions on or about the Moon.
  - GS lunar spacecraft
    - . **lunar probes**
    - . . Lunik lunar probes
    - . . . Lunik 2 lunar probe
    - . . . Lunik 3 lunar probe
    - . . . Lunik 9 lunar probe
    - . . . Lunik 10 lunar probe
    - . . . Lunik 11 lunar probe
    - . . . Lunik 12 lunar probe
    - . . . Lunik 13 lunar probe
    - . . . Lunik 14 lunar probe
    - . . . Lunik 16 lunar probe
    - . . . Lunik 17 lunar probe
    - . . . Lunik 19 lunar probe
    - . . . Lunik 20 lunar probe
    - . . . Lunik 22 lunar probe
    - . . Ranger lunar probes
    - . . . Ranger 1 lunar probe
    - . . . Ranger 2 lunar probe
    - . . . Ranger 3 lunar probe
    - . . . Ranger 4 lunar probe
    - . . . Ranger 5 lunar probe
    - . . . Ranger 6 lunar probe
    - . . . Ranger 7 lunar probe
    - . . . Ranger 8 lunar probe
    - . . . Ranger 9 lunar probe
    - . . . Ranger lunar landing vehicles
    - . . Surveyor lunar probes
    - . . . Surveyor 1 lunar probe
    - . . . Surveyor 2 lunar probe
    - . . . Surveyor 3 lunar probe
    - . . . Surveyor 4 lunar probe
    - . . . Surveyor 5 lunar probe
    - . . . Surveyor 6 lunar probe
    - . . . Surveyor 7 lunar probe
    - . . LCROSS (satellite)
    - . . Lunar Reconnaissance Orbiter
    - unmanned spacecraft
      - . space probes
      - . . **lunar probes**
      - . . . Lunik lunar probes
      - . . . . Lunik 2 lunar probe
      - . . . . Lunik 3 lunar probe

## lunar programs

- . . . . Lunik 9 lunar probe
- . . . . Lunik 10 lunar probe
- . . . . Lunik 11 lunar probe
- . . . . Lunik 12 lunar probe
- . . . . Lunik 13 lunar probe
- . . . . Lunik 14 lunar probe
- . . . . Lunik 16 lunar probe
- . . . . Lunik 17 lunar probe
- . . . . Lunik 19 lunar probe
- . . . . Lunik 20 lunar probe
- . . . . Lunik 22 lunar probe
- . . . Ranger lunar probes
- . . . . Ranger 1 lunar probe
- . . . . Ranger 2 lunar probe
- . . . . Ranger 3 lunar probe
- . . . . Ranger 4 lunar probe
- . . . . Ranger 5 lunar probe
- . . . . Ranger 6 lunar probe
- . . . . Ranger 7 lunar probe
- . . . . Ranger 8 lunar probe
- . . . . Ranger 9 lunar probe
- . . . . Ranger lunar landing vehicles
- . . . Surveyor lunar probes
- . . . . Surveyor 1 lunar probe
- . . . . Surveyor 2 lunar probe
- . . . . Surveyor 3 lunar probe
- . . . . Surveyor 4 lunar probe
- . . . . Surveyor 5 lunar probe
- . . . . Surveyor 6 lunar probe
- . . . . Surveyor 7 lunar probe
- . . . LCROSS (satellite)
- . . . Lunar Reconnaissance Orbiter

RT Apollo project  
Atlas Able 5 launch vehicle  
maneuverable spacecraft  
Pioneer project  
Ranger project  
soft landing spacecraft  
Surveyor project

### lunar programs

GS programs  
. **lunar programs**  
. . Apollo project  
. . Surveyor project

RT Lunar Prospector

### Lunar Prospector

*(added February 1998)*  
GS artificial satellites  
. lunar satellites  
. . **Lunar Prospector**  
lunar spacecraft  
. lunar satellites  
. . **Lunar Prospector**

RT lunar composition  
lunar exploration  
lunar programs  
lunar resources  
lunar surface

### lunar radar echoes

UF *lunar scattering*  
GS echoes  
. lunar echoes  
. . **lunar radar echoes**  
. . radar echoes  
. . . **lunar radar echoes**

RT selenology

### lunar radiation

GS extraterrestrial radiation  
. **lunar radiation**

RT ∞ radiation  
selenology

### lunar rangefinding

UF *LLR (ranging)*  
*lunar laser ranging*

GS rangefinding  
. **lunar rangefinding**

RT distance measuring equipment  
laser range finders  
laser ranging  
measuring instruments  
optical range finders  
range finders

### lunar rays

SN (EXCLUDES RADIATION)

RT meteorite craters  
moon  
∞ rays  
selenography

### lunar receiving laboratory

GS laboratories  
. lunar laboratories  
. . **lunar receiving laboratory**

### Lunar Reconnaissance Orbiter

*(added July 2009)*  
DEF Orbiter spacecraft and associated lunar mission to identify safe landing sites, locate potential resources, characterize the radiation environment, and demonstrate new technologies. Launched June 18, 2009.

GS artificial satellites  
. lunar satellites  
. . **Lunar Reconnaissance Orbiter**  
lunar spacecraft  
. lunar probes  
. . **Lunar Reconnaissance Orbiter**  
. . lunar satellites  
. . . **Lunar Reconnaissance Orbiter**  
unmanned spacecraft  
. space probes  
. . lunar probes  
. . . **Lunar Reconnaissance Orbiter**

RT LCROSS (satellite)  
lunar environment  
lunar exploration  
lunar landing sites  
lunar resources

### lunar resources

*(added August 1990)*  
GS resources  
. extraterrestrial resources  
. . **lunar resources**

RT in situ resource utilization  
LCROSS (satellite)  
lunar excavation equipment  
lunar exploration  
lunar mining  
Lunar Prospector  
Lunar Reconnaissance Orbiter  
lunar rocks  
lunar soil  
lunar surface

### lunar retroreflectors

GS lunar based equipment  
. **lunar retroreflectors**

RT Apollo Lunar Surface Experiments  
Package  
Earth-Moon system  
geodesy  
laser range finders  
retroreflection  
U.S.S.R. space program

### lunar rocks

GS rocks  
. **lunar rocks**  
. . krep  
RT gabbro  
impact melts  
lunar maria  
lunar mining  
lunar resources  
particle tracks  
pre-Imbrian period  
regolith  
selenography  
selenology

### lunar rotation

GS gyration  
. rotation  
. . **lunar rotation**  
rotating bodies  
. **lunar rotation**

RT center of gravity  
selenology  
spin dynamics

### lunar roving vehicles

UF *LRV (vehicle)*  
GS surface vehicles

. lunar surface vehicles  
. . **lunar roving vehicles**  
. . . Lunokhod lunar roving vehicles  
. . . manned lunar surface vehicles  
. . roving vehicles  
. . **lunar roving vehicles**  
. . . Lunokhod lunar roving vehicles  
. . . manned lunar surface vehicles

RT research vehicles  
∞ vehicles

### lunar satellites

GS artificial satellites  
. **lunar satellites**  
. . Explorer 18 satellite  
. . Explorer 28 satellite  
. . IMP  
. . Lunar Orbiter  
. . . Lunar Orbiter 1  
. . . Lunar Orbiter 2  
. . . Lunar Orbiter 3  
. . . Lunar Orbiter 4  
. . . Lunar Orbiter 5  
. . LCROSS (satellite)  
. . Lunar Prospector  
. . Lunar Reconnaissance Orbiter  
. . orbiting lunar stations  
lunar spacecraft  
. **lunar satellites**  
. . Explorer 18 satellite  
. . Explorer 28 satellite  
. . IMP  
. . Lunar Orbiter  
. . . Lunar Orbiter 1  
. . . Lunar Orbiter 2  
. . . Lunar Orbiter 3  
. . . Lunar Orbiter 4  
. . . Lunar Orbiter 5  
. . LCROSS (satellite)  
. . Lunar Prospector  
. . Lunar Reconnaissance Orbiter  
. . orbiting lunar stations

RT maneuverable spacecraft  
manned spacecraft  
perilunes  
polar orbits  
unmanned spacecraft

### lunar scattering

USE **diffuse radiation**  
**lunar radar echoes**

### lunar seismographs

GS measuring instruments  
. vibration meters  
. . seismographs  
. . . **lunar seismographs**  
recording instruments  
. seismographs  
. . **lunar seismographs**

RT lunar geology  
selenology

### lunar shadow

GS shadows  
. **lunar shadow**

RT eclipses  
moon  
selenology  
solar eclipses

### lunar shelters

GS shelters  
. **lunar shelters**

RT inflatable structures  
life support systems  
lunar based equipment  
lunar construction equipment  
space colonies  
survival  
∞ tunnels

### lunar soil

GS soils  
. **lunar soil**  
. . lunar dust

RT krep  
lunar mining  
lunar resources  
minerals

- moon
  - penetrometers
  - selenology
  - space weathering
- lunar spacecraft**
- GS **lunar spacecraft**
    - . Apollo spacecraft
    - . . Apollo lunar experiment module
    - . lunar landing modules
    - . . Lunar Module
    - . . . Apollo lunar experiment module
    - . . . LSSM
    - . . . Lunar Module 5
    - . . . Lunar Module 7
    - . . Altair Lunar Lander
    - . lunar probes
    - . Lunik lunar probes
    - . . Lunik 2 lunar probe
    - . . Lunik 3 lunar probe
    - . . Lunik 9 lunar probe
    - . . Lunik 10 lunar probe
    - . . Lunik 11 lunar probe
    - . . Lunik 12 lunar probe
    - . . Lunik 13 lunar probe
    - . . Lunik 14 lunar probe
    - . . Lunik 16 lunar probe
    - . . Lunik 17 lunar probe
    - . . Lunik 19 lunar probe
    - . . Lunik 20 lunar probe
    - . . Lunik 22 lunar probe
    - . Ranger lunar probes
    - . . Ranger 1 lunar probe
    - . . Ranger 2 lunar probe
    - . . Ranger 3 lunar probe
    - . . Ranger 4 lunar probe
    - . . Ranger 5 lunar probe
    - . . Ranger 6 lunar probe
    - . . Ranger 7 lunar probe
    - . . Ranger 8 lunar probe
    - . . Ranger 9 lunar probe
    - . . Ranger lunar landing vehicles
    - . Surveyor lunar probes
    - . . Surveyor 1 lunar probe
    - . . Surveyor 2 lunar probe
    - . . Surveyor 3 lunar probe
    - . . Surveyor 4 lunar probe
    - . . Surveyor 5 lunar probe
    - . . Surveyor 6 lunar probe
    - . . Surveyor 7 lunar probe
    - . . LCROSS (satellite)
    - . . Lunar Reconnaissance Orbiter
    - . lunar satellites
    - . . Explorer 18 satellite
    - . . Explorer 28 satellite
    - . . IMP
    - . . Lunar Orbiter
    - . . . Lunar Orbiter 1
    - . . . Lunar Orbiter 2
    - . . . Lunar Orbiter 3
    - . . . Lunar Orbiter 4
    - . . . Lunar Orbiter 5
    - . . LCROSS (satellite)
    - . . Lunar Prospector
    - . . Lunar Reconnaissance Orbiter
    - . . orbiting lunar stations
    - . . Crew Exploration Vehicle
  - RT Apollo 5 flight
  - Apollo 6 flight
  - artificial satellites
  - Clementine spacecraft
  - Halo Orbit space station
  - manned spacecraft
  - rendezvous spacecraft
  - space capsules
  - ∞ spacecraft
  - Surveyor project
  - unmanned spacecraft
- lunar surface**
- GS satellite surfaces
  - . **lunar surface**
  - RT Clementine spacecraft
  - LCROSS (satellite)
  - Lunar Prospector
  - lunar resources
  - selenology
  - surface layers
  - surface properties
- ∞ surfaces
- Lunar Surface Scientific Modules*
- USE **LSSM**
- lunar surface vehicles**
- GS surface vehicles
  - . **lunar surface vehicles**
  - . . lunar mobile laboratories
  - . . lunar roving vehicles
  - . . Lunokhod lunar roving vehicles
  - . . . manned lunar surface vehicles
  - RT crawler tractors
  - lunar based equipment
  - lunar construction equipment
  - lunar excavation equipment
  - ∞ surfaces
  - ∞ vehicles
  - walking machines
- lunar temperature**
- GS temperature
  - . **lunar temperature**
  - RT high temperature environments
  - low temperature environments
  - moon
  - selenology
- lunar tides**
- DEF The parts of tides caused solely by the tide producing force of the moon.
  - GS lunar effects
  - . **lunar tides**
  - tides
  - . **lunar tides**
  - RT atmospheric tides
  - Earth tides
  - moonquakes
  - selenology
- lunar topography**
- GS topography
  - . **lunar topography**
  - RT moon
  - selenography
  - selenology
  - surface properties
  - surface roughness
- lunar trajectories**
- GS trajectories
  - . spacecraft trajectories
  - . . **lunar trajectories**
  - . . . circumlunar trajectories
  - . . . Earth-Moon trajectories
  - . . . moon-Earth trajectories
  - RT parking orbits
  - transfer orbits
- lunation*
- USE **month**
- luneberg lenses*
- USE **radar corner reflectors**
- lung morphology**
- GS morphology
  - . **lung morphology**
  - RT alveoli
  - pulmonary lesions
  - respiratory diseases
- lungs**
- GS anatomy
  - . respiratory system
  - . . **lungs**
  - . . . alveoli
  - RT alveolar air
  - atelectasis
  - bronchi
  - pleurae
  - pneumography
  - pneumothorax
  - pulmonary circulation
  - pulmonary functions
  - pulmonary lesions
  - spirometers
- Lunik 2 lunar probe**
- GS lunar spacecraft
  - . lunar probes
- . Lunik lunar probes
  - . . Lunik 2 lunar probe
  - . . . Lunik 2 lunar probe
  - . . . Soviet spacecraft
  - . . . Lunik lunar probes
  - . . . Lunik 2 lunar probe
  - . . . unmanned spacecraft
  - . . . space probes
  - . . . Lunik probes
  - . . . Lunik lunar probes
  - . . . Lunik 2 lunar probe
- Lunik 3 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 3 lunar probe
  - . . . Soviet spacecraft
  - . . Lunik lunar probes
  - . Lunik 3 lunar probe
  - unmanned spacecraft
  - . space probes
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 3 lunar probe
- Lunik 9 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 9 lunar probe
  - . . . Soviet spacecraft
  - . Lunik lunar probes
  - . Lunik 9 lunar probe
  - unmanned spacecraft
  - . space probes
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 9 lunar probe
- Lunik 10 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 10 lunar probe
  - . . . Soviet spacecraft
  - . Lunik lunar probes
  - . Lunik 10 lunar probe
  - unmanned spacecraft
  - . space probes
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 10 lunar probe
- Lunik 11 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 11 lunar probe
  - . . . Soviet spacecraft
  - . Lunik lunar probes
  - . Lunik 11 lunar probe
  - unmanned spacecraft
  - . space probes
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 11 lunar probe
- Lunik 12 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 12 lunar probe
  - . . . Soviet spacecraft
  - . Lunik lunar probes
  - . Lunik 12 lunar probe
  - unmanned spacecraft
  - . space probes
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 12 lunar probe
- Lunik 13 lunar probe**
- GS lunar spacecraft
  - . lunar probes
  - . Lunik lunar probes
  - . . Lunik 13 lunar probe
  - . . . Soviet spacecraft
  - . Lunik lunar probes
  - . Lunik 13 lunar probe
  - unmanned spacecraft

## Lunik 14 lunar probe

- . space probes
- . . . lunar probes
- . . . . Lunik lunar probes
- . . . . . **Lunik 13 lunar probe**

### Lunik 14 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 14 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 14 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 14 lunar probe**

### Lunik 16 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 16 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 16 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 16 lunar probe**

### Lunik 17 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 17 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 17 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 17 lunar probe**

### Lunik 19 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 19 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 19 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 19 lunar probe**
- RT U.S.S.R. space program

### Lunik 20 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 20 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 20 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 20 lunar probe**

### Lunik 22 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . Lunik lunar probes
- . . . **Lunik 22 lunar probe**
- Soviet spacecraft
- . Lunik lunar probes
- . . **Lunik 22 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Lunik lunar probes
- . . . . **Lunik 22 lunar probe**

RT U.S.S.R. space program

### Lunik lunar probes

DEF Russian term for a space probe launched to the moon's vicinity or to impact on the Moon. Used for LUNA lunar probes.

UF *LUNA lunar probes*

GS lunar spacecraft

- . lunar probes

- . . **Lunik lunar probes**

- . . . Lunik 2 lunar probe

- . . . Lunik 3 lunar probe

- . . . Lunik 9 lunar probe

- . . . Lunik 10 lunar probe

- . . . Lunik 11 lunar probe

- . . . Lunik 12 lunar probe

- . . . Lunik 13 lunar probe

- . . . Lunik 14 lunar probe

- . . . Lunik 16 lunar probe

- . . . Lunik 17 lunar probe

- . . . Lunik 19 lunar probe

- . . . Lunik 20 lunar probe

- . . . Lunik 22 lunar probe

- Soviet spacecraft

- . **Lunik lunar probes**

- . . Lunik 2 lunar probe

- . . Lunik 3 lunar probe

- . . Lunik 9 lunar probe

- . . Lunik 10 lunar probe

- . . Lunik 11 lunar probe

- . . Lunik 12 lunar probe

- . . Lunik 13 lunar probe

- . . Lunik 14 lunar probe

- . . Lunik 16 lunar probe

- . . Lunik 17 lunar probe

- . . Lunik 19 lunar probe

- . . Lunik 20 lunar probe

- . . Lunik 22 lunar probe

- unmanned spacecraft

- . space probes

- . . lunar probes

- . . . **Lunik lunar probes**

- . . . . Lunik 2 lunar probe

- . . . . Lunik 3 lunar probe

- . . . . Lunik 9 lunar probe

- . . . . Lunik 10 lunar probe

- . . . . Lunik 11 lunar probe

- . . . . Lunik 12 lunar probe

- . . . . Lunik 13 lunar probe

- . . . . Lunik 14 lunar probe

- . . . . Lunik 16 lunar probe

- . . . . Lunik 17 lunar probe

- . . . . Lunik 19 lunar probe

- . . . . Lunik 20 lunar probe

- . . . . Lunik 22 lunar probe

RT Lunokhod lunar roving vehicles

U.S.S.R. space program

### Lunokhod lunar roving vehicles

GS surface vehicles

- . lunar surface vehicles

- . . lunar roving vehicles

- . . . **Lunokhod lunar roving vehicles**

- . . roving vehicles

- . . lunar roving vehicles

- . . . **Lunokhod lunar roving vehicles**

RT Lunik lunar probes

Marsokhod Mars roving vehicles

U.S.S.R. space program

∞ vehicles

### luster

DEF The appearance characteristic of a specimen due to pronounced changes in intensity of light reflected from elemental areas of the specimen when the angle of illumination or view is changed. Used for dullness.

UF *dullness*

RT brightness

- finishes

- glare

- reflectance

### lutetium

GS chemical elements

- . nuclides

- . . isotopes

- . . . **lutetium**

- . . . . lutetium isotopes

- . . . . rare earth elements

- . . **lutetium**

- . . . lutetium isotopes

- metals

- . rare earth elements

- . . **lutetium**

- . . . lutetium isotopes

*lutetium 176*

USE **lutetium isotopes**

### lutetium compounds

GS rare earth compounds

- . **lutetium compounds**

RT ∞ chemical compounds

∞ metal compounds

### lutetium isotopes

UF *lutetium 176*

GS chemical elements

- . nuclides

- . . isotopes

- . . . lutetium

- . . . . **lutetium isotopes**

- . . . . rare earth elements

- . . lutetium

- . . . **lutetium isotopes**

- metals

- . rare earth elements

- . . lutetium

- . . . **lutetium isotopes**

### Luxembourg

GS nations

- . **Luxembourg**

RT Europe

- Luxembourg space program

### Luxembourg effect

RT ∞ effects

- ionospheric cross modulation

- ionospheric propagation

### Luxembourg space program

(added March 1989)

GS programs

- . space programs

- . . European space programs

- . . . **Luxembourg space program**

RT Luxembourg

### Lyapunov functions

USE **Liapunov functions**

### Lybia

USE **Libya**

### Lyman alpha radiation

DEF The radiation emitted by hydrogen at 1216 angstrom, first observed in the solar spectrum by rocket borne spectrographs. Lyman alpha is very important in the heating of the upper atmosphere thus affecting other atmospheric phenomena.

GS electromagnetic radiation

- . ultraviolet radiation

- . . far ultraviolet radiation

- . . . **Lyman alpha radiation**

RT atomic spectra

- extraterrestrial radiation

- polarized electromagnetic radiation

∞ radiation

- ultraviolet astronomy

### Lyman beta radiation

GS electromagnetic radiation

- . ultraviolet radiation

- . . far ultraviolet radiation

- . . . **Lyman beta radiation**

RT atomic spectra

- extraterrestrial radiation

- polarized electromagnetic radiation

∞ radiation

- ultraviolet astronomy

### Lyman spectra

GS spectra

- . radiation spectra

- . . electromagnetic spectra

- . . . line spectra

- . . . . **Lyman spectra**

RT atomic spectra

electronic spectra  
 emission spectra  
 H lines  
 solar spectra  
 spectral theory  
 ultraviolet spectra

**lymph**

GS body fluids  
 . **lymph**  
 RT lymphatic system  
 lymphocytes

*lymph nodes*

(added February 2002)  
 USE **lymphatic system**

**lymphatic system**

(added February 2002)  
 DEF A major component of the immune system consisting of a network of vessels, organs, and nodes that collect and filter lymph from body tissues and return it to the bloodstream.

UF *lymph nodes*  
*lymphoid system*  
 GS anatomy  
 . immune systems  
 . . **lymphatic system**  
 . . . spleen  
 . . . thymus gland  
 RT antibodies  
 bone marrow  
 immunology  
 lymph  
 lymphocytes  
 metastasis

**lymphocytes**

GS cells (biology)  
 . blood cells  
 . . leukocytes  
 . . . **lymphocytes**  
 RT blood cell count  
 immune systems  
 lymph

lymphatic system

*lymphoid system*  
 (added February 2002)  
 USE **lymphatic system**

*lyophilization*  
 USE **colloiding**

*lyophils*  
 USE **colloids**

**Lyra constellation**  
 GS constellations  
 . **Lyra constellation**  
 RT celestial bodies  
 celestial sphere  
 stars

**lysergine**  
 GS bases (chemical)  
 . alkaloids  
 . . **lysergine**  
 nitrogen compounds  
 . alkaloids  
 . . **lysergine**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . alkaloids  
 . . . . **lysergine**

**lysimeters**  
 DEF Instruments for measuring the water percolating through soils and determining the materials dissolved by the water.  
 GS measuring instruments  
 . **lysimeters**  
 RT ground water  
 moisture content  
 percolation  
 soil moisture  
 soils  
 water balance  
 water pollution

**lysine**  
 GS acids  
 . amino acids  
 . . **lysine**  
 . carboxylic acids  
 . . **lysine**  
 organic compounds

. amino acids  
 . . **lysine**  
 . carboxylic acids  
 . . **lysine**  
 RT digesting  
 lysogenesis

**Lysithea**  
 (added January 1996)  
 DEF A natural satellite of Jupiter orbiting at a mean distance of 11,720,000 kilometers.  
 GS celestial bodies  
 . natural satellites  
 . . Jupiter satellites  
 . . . **Lysithea**  
 RT Jupiter (planet)

**lysogenesis**  
 RT disintegration  
 lysine

**lysosomes**  
 GS organelles  
 . **lysosomes**  
 RT cells (biology)  
 cytology  
 enzyme activity  
 lysozyme

**lysozyme**  
 GS biopolymers  
 . proteins  
 . . enzymes  
 . . . **lysozyme**  
 organic compounds  
 . proteins  
 . . enzymes  
 . . . **lysozyme**  
 RT body fluids  
 lysosomes

**LZEEBE satellite**  
 UF *Earth Energy Budget Experiment*  
*Long Term Zonal Earth Energy*  
*Experiment*  
*Zonal Earth Energy Budget*  
*Experiment*  
 GS artificial satellites  
 . scientific satellites  
 . . **LZEEBE satellite**

# M

## M region

- GS regions
  - . **M region**
- RT geomagnetism
  - solar atmosphere
  - solar corpuscular radiation
  - solar wind

## M stars

- GS celestial bodies
  - . stars
  - .. late stars
  - ... cool stars
  - .... **M stars**
  - ..... Van Biesbroeck star
- RT asymptotic giant branch stars
  - flare stars
  - giant stars
  - main sequence stars
  - Mira variables
  - red giant stars
  - S stars
  - subgiant stars
  - supergiant stars
  - symbiotic stars

## M wings

- USE **variable sweep wings**

## M-1 engine

- UF *AJ-1000 engine*
- GS engines
  - . rocket engines
  - .. booster rocket engines
  - ... **M-1 engine**
  - .. liquid propellant rocket engines
  - ... hydrogen oxygen engines
  - .... **M-1 engine**
- RT Nova launch vehicles
  - Saturn 1 launch vehicles
  - Saturn 1B launch vehicles

## M-2 lifting body

- GS lifting bodies
  - . lifting reentry vehicles
  - .. **M-2 lifting body**
  - ... M-2F2 lifting body
  - reentry vehicles
  - . maneuverable reentry bodies
  - .. lifting reentry vehicles
  - ... **M-2 lifting body**
  - .... M-2F2 lifting body

## M-2F2 lifting body

- GS lifting bodies
  - . lifting reentry vehicles
  - .. M-2 lifting body
  - ... **M-2F2 lifting body**
  - reentry vehicles
  - . maneuverable reentry bodies
  - .. lifting reentry vehicles
  - ... M-2 lifting body
  - .... **M-2F2 lifting body**

## M-2F3 lifting body

- GS lifting bodies
  - . **M-2F3 lifting body**

## M-46 engine

- GS engines
  - . rocket engines
  - .. solid propellant rocket engines
  - ... **M-46 engine**
- RT Falcon missile

## M-55 engine

- GS engines
  - . rocket engines
  - .. booster rocket engines
  - ... **M-55 engine**
  - .. solid propellant rocket engines
  - ... **M-55 engine**
- RT Minuteman ICBM

## M-56 engine

- GS engines
  - . rocket engines
  - .. solid propellant rocket engines
  - ... **M-56 engine**

- RT Minuteman ICBM

## M-57 engine

- GS engines
  - . rocket engines
  - .. solid propellant rocket engines
  - ... **M-57 engine**
- RT Minuteman ICBM

## M-100 engine

- GS engines
  - . rocket engines
  - .. **M-100 engine**

## MA-2 engine

- GS engines
  - . rocket engines
  - .. booster rocket engines
  - ... **MA-2 engine**
  - .. liquid propellant rocket engines
  - ... **MA-2 engine**
- RT Atlas ICBM
  - Vernier engines

## MA-2 mission

- USE **Mercury MA-2 flight**

## MA-3 engine

- GS engines
  - . rocket engines
  - .. booster rocket engines
  - ... **MA-3 engine**
  - .. liquid propellant rocket engines
  - ... **MA-3 engine**
- RT Atlas ICBM
  - Vernier engines

## MA-3 flight

- USE **Mercury MA-3 flight**

## MA-4 flight

- USE **Mercury MA-4 flight**

## MA-5 engine

- GS engines
  - . rocket engines
  - .. booster rocket engines
  - ... **MA-5 engine**
  - .. liquid propellant rocket engines
  - ... **MA-5 engine**
- RT Atlas launch vehicles
  - Atlas SLV-3 launch vehicle
  - Vernier engines

## MA-5 flight

- USE **Mercury MA-5 flight**

## MA-8 flight

- USE **Mercury MA-8 flight**

## MA-9 flight

- USE **Mercury MA-9 flight**

## maars

- USE **craters**

## Mace missiles

- GS missiles
  - . surface to surface missiles
  - .. **Mace missiles**
- RT booster rocket engines
  - J-33 engine
  - solid propellant rocket engines
  - turbojet engines

## Mach cones

DEF The cone shaped shock waves theoretically emanating from an infinitesimally small particle moving at supersonic speed through a fluid medium. It is the locus of the Mach lines. The cone shaped shock waves generated by a sharp pointed body, as at the nose of a high speed aircraft.

- GS cones
  - . **Mach cones**
  - elastic waves
  - . shock waves
  - .. **Mach cones**
- RT acoustic velocity
  - bow waves

- hypersonic shock
- sound waves
- supersonic flight
- supersonic flow
- supersonics

## Mach inertia principle

- GS inertia
  - . inertia principle
  - .. **Mach inertia principle**
- RT equations of motion
  - moments of inertia

## Mach number

DEF A number expressing the ratio of the speed of a body or a point on a body with respect to the surrounding air or other fluid, or the speed of a flow, to the speed of sound in the medium; the speed represented by this number. Used for critical Mach number and Glauert coefficient.

- UF *critical Mach number*
- Glauert coefficient*
- GS dimensionless numbers
  - . **Mach number**
  - ratios
  - . **Mach number**
- RT acoustic velocity
  - aerodynamics
  - airspeed
  - shock waves
  - superharmonics
  - sweep angle

## Mach reflection

DEF The reflection of a shock wave from a rigid wall in which the shock strength of the reflected wave and the angle of reflection both have the smaller of the two values theoretically possible.

- GS reflection
  - . wave reflection
  - .. **Mach reflection**
- RT shock waves

## machine aided indexing

- (added April 2000)
- USE **indexing (information science)**

## machine learning

- (added May 1989)
- UF *learning machines*
- RT adaptive control
  - artificial intelligence
  - automata theory
  - backpropagation (artificial intelligence)
  - cybernetics
  - data mining
  - feedback control
  - genetic algorithms
  - ∞ machinery
  - membership functions
  - self organizing systems
  - teaching machines

## machine life

- USE **service life**

## machine oriented languages

- GS languages
  - . programming languages
  - .. **machine oriented languages**
- RT ALGOL
  - Assembly language
  - autocoders
  - language programming
  - PL/1

## machine recognition

- USE **artificial intelligence**

## machine storage

- USE **computer storage devices**
- core storage**

## machine tools

- GS tools
  - . **machine tools**
  - .. boring machines

- . . grinding machines
  - . . lathes
  - . . . turret lathes
  - . . milling machines
  - . . shapers
  - RT cutters
  - dies
  - drills
  - ∞ machinery
  - machining
  - mandrels
  - mechanical devices
  - mechanical engineering
  - metal cutting
  - numerical control
  - presses
  - punches
  - saws
  - shears
  - taps
  - ultrasonic cleaning
- machine translation**
- GS linguistics
  - . **machine translation**
  - translating
  - . **machine translation**
  - RT computer programs
  - information theory
  - language programming
  - languages
  - natural language processing
- machine vision*
- USE **computer vision**
- machine-independent programs**
- GS computer programs
  - . **machine-independent programs**
  - RT computer programming
  - computers
  - multiprogramming
- ∞ **machinery**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT boring machines
  - computers
  - drafting machines
  - engines
  - fatigue testing machines
  - grinding machines
  - ground effect machines
  - impact testing machines
  - levers
  - load testing machines
  - machine learning
  - machine tools
  - mechanical engineering
  - ∞ mechanism
  - mechanization
  - milling machines
  - positioning devices (machinery)
  - refrigerating machinery
  - ∞ rotating electrical machines
  - self focusing
  - teaching machines
  - tide powered machines
  - tools
  - turbomachinery
  - Turing machines
  - vibration simulators
  - walking machines
  - waterwave powered machines
  - welding machines
  - windmills (windpowered machines)
- machining**
- UF *material removal (machining)*
  - GS **machining**
  - . chemical machining
  - . . electrochemical machining
  - . hot machining
  - . laser machining
  - . micromachining
  - . milling (machining)
  - . spark machining
  - . ultrasonic machining
  - RT ∞ cut-off
- cutting
  - drilling
  - finishes
  - forming techniques
  - grinding (material removal)
  - grooving
  - knurling
  - laser cutting
  - machine tools
  - metal cutting
  - metal working
  - planing
  - residual stress
  - setups
  - surface finishing
  - surface roughness
  - tooling
  - V grooves
- MACHOs (astronomy)*  
(added November 1999)
- USE **massive compact halo objects**
- Mach-Zehnder interferometers**
- GS measuring instruments
  - . interferometers
  - . . **Mach-Zehnder interferometers**
  - RT aerodynamics
  - argon lasers
  - carbon dioxide lasers
  - diffractometers
  - gas lasers
  - goniometers
  - optical equipment
  - optical measuring instruments
  - Schlieren photography
- Macintosh PC*
- USE **Macintosh personal computers**
- Macintosh personal computers**  
(added September 1992)
- UF *Macintosh PC*
  - GS data processing equipment
  - . computers
  - . . digital computers
  - . . . microcomputers
  - . . . . personal computers
  - . . . . . **Macintosh personal computers**
  - RT computer graphics
  - computer programs
- MacLaurin series**
- UF *MacLaurin series*
  - GS analysis (mathematics)
  - . calculus
  - . . series (mathematics)
  - . . . power series
  - . . . . Taylor series
  - . . . . . **MacLaurin series**
  - . real variables
  - . . series (mathematics)
  - . . . power series
  - . . . . Taylor series
  - . . . . . **MacLaurin series**
- macroclimate*
- USE **climate**
- macromolecules**  
(added March 1990)
- GS molecules
  - . **macromolecules**
  - . . dendrimers
  - RT molecular chains
  - molecular structure
  - molecular weight
  - ∞ polymers
  - proteins
- macrophages**
- GS cells (biology)
  - . **macrophages**
  - RT tissues (biology)
- macroscopic equations**
- RT ∞ equations
  - ∞ measurement
  - ∞ properties
- statistical mechanics
- macular vision*
- USE **vision**
- Madagascar**  
(added September 1993)
- UF *Malagasy Republic*
  - GS landforms
  - . islands
  - . . **Madagascar**
  - nations
  - . **Madagascar**
  - RT Africa
  - Indian Ocean
- Madden-Julian Oscillation**  
(added September 2000)
- DEF The most dominant and coherent component of the intraseasonal variability in the tropical atmosphere; characterized by a strong eastward propagation of atmospheric features, with a typical period of 30-60 days. The Madden-Julian Oscillation (MJO) may influence the tropical climate and its short-term variability by modulating the timing and strength of El Niño - Southern Oscillation (ENSO) events, contributing to the mean heat budget of the western Pacific, and regulating the annual cycle of the tropical western Pacific, especially the Australian summer monsoon.
- UF *MJO (meteorology)*
  - GS oscillations
  - . **Madden-Julian Oscillation**
  - variations
  - . periodic variations
  - . . intraseasonal variations
  - . . . **Madden-Julian Oscillation**
  - RT air water interactions
  - annual variations
  - atmospheric circulation
  - atmospheric models
  - climatology
  - el Niño
  - monsoons
  - Southern Oscillation
  - tropical meteorology
  - zonal flow (meteorology)
- Maffei galaxies**
- GS celestial bodies
  - . galaxies
  - . . **Maffei galaxies**
  - RT nebulae
  - radio astronomy
  - radio galaxies
  - radio sources (astronomy)
  - spiral galaxies
- magazines (supply chambers)**
- RT ammunition
  - photographic film
  - spools
- Magdalena-Cauca Valley (Colombia)**
- GS landforms
  - . **Magdalena-Cauca Valley (Colombia)**
  - valleys
  - . **Magdalena-Cauca Valley (Colombia)**
  - RT Colombia
  - South America
- Magellan Mission (ESA)*
- USE **Magellan ultraviolet astronomy satellite**
- Magellan project (NASA)**
- SN (DOES NOT INCLUDE THE MAGELLAN ULTRAVIOLET ASTRONOMY SATELLITE)
  - DEF A Venus exploratory mission to acquire radar imagery and topographic profiles of the planet surface and determine the characteristics of the Venusian gravity field. (This term is used to designate general project reviews, chronologies, and project management and planning.) Used for Venus Radar Mapper Project.
  - UF *Venus Radar Mapper Project*
  - GS programs
  - . NASA programs



## Magellan spacecraft (NASA)

- . . NASA space programs
- . . . **Magellan project (NASA)**
- . projects
- . . **Magellan project (NASA)**
- . space programs
- . . NASA space programs
- . . . **Magellan project (NASA)**

- RT Magellan spacecraft (NASA)
- space exploration
- space missions
- Venus orbiting imaging radar
- (spacecraft)
- Venus probes
- Venus surface

### Magellan spacecraft (NASA)

SN (DOES NOT INCLUDE THE MAGELLAN ULTRAVIOLET ASTRONOMY SATELLITE)

DEF A Venus probe incorporating Voyager and Galileo hardware designs equipped with a synthetic aperture radar system to acquire surface imagery, altimetric profiles, and surface radiothermal emissivities. Earth-based Doppler radio tracking of the spacecraft will be used to derive gravimetric data. (This term designates the spacecraft intrinsic and support hardware, instrumentation acquired data.) Used for Venus Radar Mapper.

- UF *Venus Radar Mapper*
- GS interplanetary spacecraft
- . Venus probes
- . . **Magellan spacecraft (NASA)**
- unmanned spacecraft
- . space probes
- . . Venus probes
- . . . **Magellan spacecraft (NASA)**
- RT Magellan project (NASA)
- radar imagery
- ∞ spacecraft
- synthetic aperture radar
- Venus orbiting imaging radar
- (spacecraft)
- Venus surface

### Magellan ultraviolet astronomy satellite

DEF This ESA mission will provide high resolution spectra of celestial sources down to sixteenth magnitude over the extreme ultraviolet wavelength range (between 50 and 150 nm). This mission is still in the study phase. Used for Magellan Mission (ESA).

- UF *Magellan Mission (ESA)*
- GS artificial satellites
- . ESA satellites
- . . **Magellan ultraviolet astronomy satellite**
- . scientific satellites
- . . astronomical satellites
- . . . **Magellan ultraviolet astronomy satellite**
- ESA spacecraft
- . ESA satellites
- . . **Magellan ultraviolet astronomy satellite**
- observatories
- . astronomical observatories
- . . astronomical satellites
- . . . **Magellan ultraviolet astronomy satellite**
- RT extreme ultraviolet radiation
- far ultraviolet radiation
- spaceborne astronomy

### Magellanic clouds

- GS celestial bodies
- . galaxies
- . . **Magellanic clouds**
- RT ∞ clouds
- nebulae
- Orion nebula
- star clusters
- stars
- supernova 1987A

### magic tees

DEF Compound waveguides or coaxial tees with four arms which exhibit directional characteristics, when properly matched, so that a signal entering one arm will be split between two of the other arms but not the third. A signal entering

another arm is likewise split with half the energy entering one of the arms common to the other input but not its second arm and the other half of the energy entering the arm not used by the other input. Magic tees are used in radar as transmitter receiver duplexers.

- RT duplexers

### magma

DEF Naturally occurring mobile rock materials, generated within the Earth and capable of intrusion and extrusion, from which igneous rocks are thought to have been derived by solidification and related processes.

- GS geophysical fluids
- . **magma**
- RT igneous rocks
- lava
- petrogenesis
- regolith
- rhyolite
- rocks
- soils
- volcanic eruptions

### magnesium

- GS chemical elements
- . **magnesium**
- . . magnesium isotopes
- metals
- . **magnesium**
- . . magnesium isotopes

### magnesium alloys

- GS alloys
- . light alloys
- . . **magnesium alloys**
- RT aluminum-lithium alloys
- bismuth alloys
- lithium alloys
- silicon alloys

### magnesium bromides

- GS halogen compounds
- . bromine compounds
- . . bromides
- . . . **magnesium bromides**
- . halides
- . . bromides
- . . . **magnesium bromides**
- . metal halides
- . . . **magnesium bromides**
- magnesium compounds
- . **magnesium bromides**

### magnesium cells

DEF Primary cells with the negative electrodes made of magnesium or its alloy.

- GS electric generators
- . direct power generators
- . . primary batteries
- . . . dry cells
- . . . . **magnesium cells**
- electrochemical cells
- . electric batteries
- . . primary batteries
- . . . dry cells
- . . . . **magnesium cells**
- RT chemical auxiliary power units
- electrolytic polarization

### magnesium chlorides

- GS halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **magnesium chlorides**
- . halides
- . . chlorides
- . . . **magnesium chlorides**
- magnesium compounds
- . **magnesium chlorides**

### magnesium compounds

- GS **magnesium compounds**
- . brucite
- . chlorophylls
- . cordierite
- . dolomite (mineral)
- . enstatite
- . forsterite

- . magnesium bromides
- . magnesium chlorides
- . magnesium fluorides
- . magnesium germanates
- . magnesium germanides
- . magnesium oxides
- . . akermanite
- . . periclase
- . magnesium perchlorates
- . magnesium sulfates
- . . hexahedrite
- . magnesium titanates
- . merwinite
- . monticellite
- . talc
- RT ∞ alkaline earth compounds
- ∞ chemical compounds
- ∞ metal compounds

### magnesium fluorides

- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . metal fluorides
- . . . . **magnesium fluorides**
- . halides
- . . fluorides
- . . . metal fluorides
- . . . . **magnesium fluorides**
- . metal halides
- . . metal fluorides
- . . . . **magnesium fluorides**
- magnesium compounds
- . **magnesium fluorides**

### magnesium germanates

- GS germanium compounds
- . germanates
- . . **magnesium germanates**
- magnesium compounds
- . **magnesium germanates**

### magnesium germanides

- GS germanium compounds
- . germanides
- . . **magnesium germanides**
- magnesium compounds
- . **magnesium germanides**

### magnesium isotopes

- GS chemical elements
- . magnesium
- . . **magnesium isotopes**
- nuclides
- . isotopes
- . . . **magnesium isotopes**
- metals
- . magnesium
- . . **magnesium isotopes**

### magnesium oxides

- GS chalcogenides
- . oxides
- . . metal oxides
- . . . alkaline earth oxides
- . . . . **magnesium oxides**
- . . . . akermanite
- . . . . periclase
- magnesium compounds
- . **magnesium oxides**
- . . akermanite
- . . periclase

### magnesium perchlorates

- GS halogen compounds
- . chlorine compounds
- . . perchlorates
- . . . **magnesium perchlorates**
- magnesium compounds
- . **magnesium perchlorates**

### magnesium sulfates

- GS magnesium compounds
- . **magnesium sulfates**
- . . hexahedrite
- sulfur compounds
- . sulfates
- . . **magnesium sulfates**
- . . . hexahedrite

- RT bloedite  
nonuniform magnetic fields  
magnetic damping
- magnesium titanates**  
GS magnesium compounds  
. **magnesium titanates**  
titanium compounds  
. titanates  
. . **magnesium titanates**
- Magnesyln (trademark)*  
USE **servomotors**
- magnet coils**  
GS electric coils  
. magnetic coils  
. . **magnet coils**  
RT  $\infty$  coils  
electromagnetism  
electromagnets  
field coils  
inductors  
magnetic circuits  
magnetic cores  
magnetic energy storage  
magnets  
saturable reactors  
solenoids  
superconducting magnets  
toroids  
transformers  
wire winding  
yokes
- magnetars**  
(*added January 2000*)  
DEF Highly magnetized neutron stars believed to emit quasi-steady x-rays along with bursts of soft gamma rays-- emissions powered by their magnetic energy. According to the magnetar theory, these stars form in some fraction of all supernovae. When they are young (with ages less than about 10,000 years) magnetars may be observed as soft gamma repeaters (SGRs) or anomalous X-ray pulsars.  
GS celestial bodies  
. stars  
. . magnetic stars  
. . . **magnetars**  
. . neutron stars  
. . . **magnetars**  
RT pulsars  
soft gamma repeaters  
supernova remnants  
x ray sources
- magnetic absorption*  
USE **electromagnetic absorption**
- magnetic amplifiers**  
GS amplifiers  
. **magnetic amplifiers**  
RT magnetostatic amplifiers  
nonlinearity  
power amplifiers  
saturable reactors  
voltage amplifiers
- magnetic annular arc**  
RT  $\infty$  arcs  
current distribution  
plasma accelerators  
plasma control  
plasma propulsion
- magnetic annular shock tubes**  
UF *MAST shock tubes*  
GS shock wave generators  
. shock tubes  
. . **magnetic annular shock tubes**
- magnetic anomalies**  
UF *geomagnetic anomalies*  
GS anomalies  
. **magnetic anomalies**  
. . geomagnetic hollow  
RT aeromagnetism  
geomagnetism
- magnetic bearings**  
DEF Any application of the principle in which something capable of rotation and translation is held by the use of electromagnetic force without touching it. Applications range from small instruments to very large forces.  
GS bearings  
. **magnetic bearings**  
RT levitation  
magnetic suspension
- magnetic charge density**  
UF *scalar magnetic charge*  
GS divergence  
. **magnetic charge density**  
RT  $\infty$  charging  
constitutive equations  
Maxwell equation
- magnetic circuits**  
GS circuits  
. **magnetic circuits**  
RT flux (rate)  
lines of force  
magnet coils  
saturable reactors  
transformers
- magnetic clouds**  
GS magnetic fields  
. **magnetic clouds**  
particles  
. charged particles  
. . plasma clouds  
. . . **magnetic clouds**  
RT  $\infty$  clouds  
interplanetary magnetic fields  
interplanetary medium  
interstellar gas  
interstellar magnetic fields  
magnetic field configurations  
solar corona  
solar wind  
stellar mass ejection
- magnetic coils**  
GS electric coils  
. **magnetic coils**  
. . field coils  
. . magnet coils  
RT  $\infty$  coils  
electromagnetic hammers  
electromagnetism  
flux pumps
- magnetic compasses**  
DEF Compasses whose operation depends upon an element that senses the Earth's magnetic field, e.g., an instrument having a magnetic needle that turns freely on a pivot in a horizontal plane and that always swings to such a position that one end points to magnetic north.  
GS measuring instruments  
. indicating instruments  
. . compasses  
. . . **magnetic compasses**  
navigation aids  
. navigation instruments  
. . compasses  
. . . **magnetic compasses**  
RT gyrocompasses  
solar compasses
- magnetic compression**  
DEF The force exerted by a magnetic field on an electrically conducting fluid or on a plasma.  
RT compressing  
confinement  
plasma control  
plasmas (physics)
- magnetic control**  
RT attitude control  
 $\infty$  control
- magnetic cooling**  
DEF Keeping a substance cooled to about 0. 2 K by using a working substance (paramagnetic salt) in a cycle of processes between a high-temperature reservoir (liquid helium) at 1. 2 K and a low temperature reservoir containing the substance to be cooled.  
GS cooling  
. **magnetic cooling**  
RT absorption cooling  
adiabatic demagnetization cooling  
low temperature  
low temperature environments  
refrigerating
- magnetic cores**  
GS cores  
. **magnetic cores**  
RT bubble memory devices  
electric coils  
ferrites  
ferromagnetism  
laminates  
magnet coils  
magnets  
parametrons  
saturable reactors  
toroids  
transformers
- magnetic damping**  
(*added January 2004*)  
DEF Mechanical, electromagnetic, or plasmadynamic damping induced by an applied magnetic field.  
GS damping  
. **magnetic damping**  
magnetic properties  
. magnetic effects  
. . **magnetic damping**  
RT Landau damping  
magnetic control  
vibration damping
- magnetic diffusion**  
SN (DIFFUSION VIA A MAGNETIC FIELD)  
GS diffusion  
. **magnetic diffusion**  
RT field strength
- magnetic dipoles**  
RT  $\infty$  dipoles  
electric dipoles  
 $\infty$  physical properties  
 $\infty$  poles
- magnetic disks**  
GS computer components  
. computer storage devices  
. . **magnetic disks**  
magnetic storage  
. **magnetic disks**  
RT core storage  
disk operating system (DOS)  
 $\infty$  disks  
memory (computers)  
peripheral equipment (computers)  
video disks
- magnetic dispersion**  
RT  $\infty$  dispersion  
electromagnetic scattering  
ferromagnetism  
magnetization  
wave scattering
- magnetic disturbances**  
GS **magnetic disturbances**  
. magnetic storms  
. . polar substorms  
RT auroras  
Birkeland currents  
 $\infty$  disturbances  
geomagnetism  
KP index  
nonadiabatic theory  
solar activity  
solar activity effects

## magnetic domains

solar flares  
solar planetary interactions  
solar terrestrial interactions  
solar wind velocity  
space weather  
starspots  
stellar activity  
sudden ionospheric disturbances  
sudden storm commencements  
sunspots

### magnetic domains

DEF Small areas on the surface of the body of thin films of a magnetic medium, each of which maintains a discrete magnetic field orientation relative to the others around it.

GS domains  
. **magnetic domains**  
RT bubble memory devices  
bubble technique  
dipole moments  
domain wall  
lines of force  
magnetic force microscopy

### magnetic drums

DEF Memory devices used in computers; rotating cylinders on which information may be stored as magnetically polarized areas, usually along several parallel tracks around the periphery.

GS computer components  
. computer storage devices  
. . **magnetic drums**  
magnetic storage  
. **magnetic drums**  
RT core storage  
 $\infty$  drums

### magnetic effects

UF *geomagnetic effects*  
GS magnetic properties  
. **magnetic effects**  
. . magnetic damping  
. . magnetic rigidity  
RT  $\infty$  effects  
flux transfer events  
geomagnetism  
magnetoactivity  
plasma compression  
quantum Hall effect  
temperature effects

### magnetic energy storage

GS energy storage  
. **magnetic energy storage**  
RT energy technology  
magnet coils  
magnetic fields  
superconducting magnets

### magnetic equator

DEF That line on the surface of the Earth connecting all points at which the magnetic dip is zero. Used for geomagnetic equator.

UF *geomagnetic equator*  
GS equators  
. **magnetic equator**  
RT geomagnetism  
 $\infty$  inclination

### magnetic field configurations

GS **magnetic field configurations**  
. magnetic islands  
RT astrophysics  
divertors (fusion reactors)  
electromagnetic fields  
flux transfer events  
force-free magnetic fields  
helical windings  
magnetic clouds  
magnetic field reconnection  
plasma compression  
plasma control  
plasma physics  
polar cusps  
poloidal flux  
spheromaks

stellar magnetic fields

*magnetic field intensity*  
USE **magnetic flux**

### magnetic field inversions

GS inversions  
. **magnetic field inversions**  
RT electromagnetic fields  
electromagnetism  
electromechanics  
field theory (physics)

### magnetic field reconnection

DEF A change in topology of the magnetic field configuration resulting from a localized breakdown of the requirement for 'connection' of fluid elements at one time on a common magnetic field line. Alternatively, it occurs when an electric field exists with a component parallel to a locally two-dimensional X-type magnetic neutral line which is equivalent to a breakdown in connection.

GS magnetic properties  
. magnetoactivity  
. . **magnetic field reconnection**  
RT field aligned currents  
flux transfer events  
interplanetary magnetic fields  
magnetic field configurations  
magnetic fields  
magnetic flux  
magnetic islands  
magnetosphere-ionosphere coupling  
solar magnetic field  
space plasmas

### magnetic fields

DEF Regions of space wherein magnetic dipoles would experience a magnetic force or torque; often represented as the geometric array of the imaginary magnetic lines of force that exist in relation to magnetic poles. Magnetic fields are also considered to be the regions of influence of magnetized bodies or electric currents.

GS **magnetic fields**  
. biomagnetism  
. force-free magnetic fields  
. geomagnetism  
. interplanetary magnetic fields  
. interstellar magnetic fields  
. lunar magnetic fields  
. magnetic clouds  
. magnetostatic fields  
. nonuniform magnetic fields  
. paleomagnetism  
. planetary magnetic fields  
. stellar magnetic fields  
. . solar magnetic field  
. trapped magnetic fields

RT Bernstein energy principle  
beta factor  
Biot-Savart law  
conjugate points  
constitutive equations  
crossed fields  
demagnetization  
Earth magnetosphere  
electric fields  
electromagnetic acceleration  
electromagnetic fields  
electromagnetism  
electromechanics  
electron-hole drops  
ferromagnetic resonance  
field emission  
field strength  
field theory (physics)  
 $\infty$  fields  
flux pumps  
flux transfer events  
geomagnetic tail  
Helios satellites  
Intasat satellite  
 $\infty$  Kerr effects  
lines of force  
Lorentz force  
magnetic energy storage  
magnetic field reconnection

magnetic force microscopy  
magnetization  
magnetoactivity  
magneto-optics  
magnetoplasma dynamics  
magneto-resistivity  
magnetostatics  
magnets  
multipolar fields  
nonthermal radiation  
particle acceleration  
pinch effect  
polar cusps  
polarity  
pulsar magnetospheres  
racetracks (particle accelerators)  
radiation belts  
screw pinch  
Scylla  
self consistent fields  
square wells  
stellar magnetospheres  
Suhl effect  
Zeeman effect

### magnetic films

GS coatings  
. **magnetic films**  
RT  $\infty$  films

### magnetic flux

DEF The magnetic force exerted on an imaginary unit magnetic pole placed at any specified point of space. It is a vector quantity. Its direction is taken as the direction toward which a north magnetic pole would tend to move under the influence of the field. If the force is measured in dynes and the unit pole is a cgs unit pole, the field intensity is given in oersteds. Used for magnetic field intensity.

UF *magnetic field intensity*  
GS field strength  
. **magnetic flux**  
rates (per time)  
. flux (rate)

. . **magnetic flux**  
RT beta factor  
constitutive equations  
current sheets  
flux pinning  
flux quantization  
flux transfer events  
force-free magnetic fields  
lines of force  
magnetic field reconnection  
pinning

### magnetic force microscopy

(added June 2004)

DEF A form of microscopy designed to study magnetic materials on a nanometer scale by detecting magnetic forces or force gradients exerted on a probing tip that is moved over a sample surface.

UF *MFM (microscopy)*  
GS microscopy  
. **magnetic force microscopy**  
RT imaging techniques  
magnetic domains  
magnetic fields  
magnetic materials  
magnetic measurement  
magnetic probes  
magnetic resonance

### magnetic forming

GS forming techniques  
. **magnetic forming**  
metal working  
. **magnetic forming**  
RT bulging  
cold working  
deep drawing  
electromagnetic hammers  
metal drawing

### magnetic induction

UF *electromagnetic deduction*  
GS magnetic properties  
. **magnetic induction**

- RT coupling coefficients  
flux (rate)  
inductance  
∞ induction  
induction heating
- magnetic induction probes*  
USE **magnetic probes**
- magnetic islands**  
(added October 1994)  
GS magnetic field configurations  
. **magnetic islands**  
RT coalescing  
collisionless plasmas  
current sheets  
geomagnetic tail  
magnetic field reconnection
- magnetic lenses**  
UF *quadrupole lenses*  
GS lenses  
. **magnetic lenses**  
RT cathode ray tubes  
electron beams  
electron guns  
electron microscopes  
electron microscopy  
plasma guns  
plasma jets  
scanning electron microscopy  
transmission electron microscopy  
wire grid lenses
- magnetic levitation vehicles**  
GS surface vehicles  
. **magnetic levitation vehicles**  
RT levitation  
lift devices  
mass drivers  
rail transportation  
suspension systems (vehicles)  
∞ vehicles
- magnetic materials**  
UF *magnetic metals*  
GS **magnetic materials**  
. ferrimagnetic materials  
. ferromagnetic materials  
. . ferrofluids  
. . ferromagnetic films  
. . magnetite  
. . Permalloys (trademark)  
RT Kondo effect  
magnetic force microscopy  
magnetorheological fluids  
magnets  
∞ materials  
permanent magnets
- magnetic measurement**  
SN (MEASUREMENT OF MAGNETIC PROPERTIES, QUANTITIES OR CONDITIONS)  
UF *fluxmeters*  
*magnetometry*  
RT electromagnetic measurement  
magnetic force microscopy  
magnetometers  
∞ materials tests  
∞ measurement  
squid (detectors)
- magnetic memories*  
USE **magnetic storage**
- magnetic metals*  
USE **magnetic materials**  
**metals**
- magnetic mirrors**  
DEF Magnetic fields so arranged that they will theoretically confine a hot plasma.  
GS mirrors  
. **magnetic mirrors**  
. . tandem mirrors  
RT lines of force  
mirror fusion  
mirror point  
nonuniform magnetic fields  
nuclear fusion
- plasma control  
plasma equilibrium  
Q devices  
Scylla  
spheromaks
- magnetic moments**  
DEF The quantities obtained by multiplying the distances between two magnetic poles by the average strength of the poles. Measures of the magnetic flux set up by the gyration of an electric field in a magnetic field. Moments are negative, indicating they are diagramatic, and equal to the energy of rotation divided by the magnetic field. In atomic and nuclear physics, moments, measured in Bohr magnetrons, are associated with the intrinsic spin of the particle and with the orbital motion of the particle in a system.  
GS magnetic properties  
. **magnetic moments**  
moments  
. dipole moments  
. . **magnetic moments**  
RT Bohr magneton  
electric moments  
Langevin formula  
quenching (atomic physics)
- magnetic monopoles**  
GS monopoles  
. **magnetic monopoles**  
particles  
. elementary particles  
. . **magnetic monopoles**  
RT quantum theory
- magnetic nozzles**  
(added September 1999)  
DEF Nozzle devices used in some nuclear and plasma propulsion systems that utilize magnetic fields to direct and accelerate plasma flows, thereby providing thrust for propulsion.  
RT coaxial plasma accelerators  
electric rocket engines  
∞ nozzles  
nuclear propulsion  
nuclear rocket engines  
plasma acceleration  
plasma engines  
plasma propulsion  
rocket nozzles  
spacecraft propulsion  
VASIMR (propulsion system)
- magnetic permeability**  
UF *magnetic susceptibility*  
*susceptibility (magnetism)*  
GS magnetic properties  
. **magnetic permeability**  
RT Curie-Weiss law  
dielectric permeability  
hysteresis  
neel temperature  
reluctance
- magnetic pistons**  
GS pistons  
. **magnetic pistons**  
RT hypersonic wind tunnels  
hypervelocity wind tunnels  
shock tubes  
shock wave generators
- magnetic poles**  
DEF Either of the two places on the surface of the Earth where the magnetic dip is 90 deg., that in the Northern Hemisphere (at, approximately, latitude 73 deg. 8 N, longitude 101 deg. W in 1955) being designated north magnetic pole, and that in the Southern Hemisphere (at, approximately, latitude, 68 deg. S, longitude 144 deg. E in 1955) being designated south magnetic pole. Either of those two points of a magnet where the magnetic force is the greatest. In magnetic theory, a fictitious entity analogous to a unit charge of electrostatic theory. In nature, only dipoles, not isolate magnetic poles exist.  
RT auroral zones  
∞ dipoles
- geomagnetism  
polarity  
∞ poles
- magnetic probes**  
UF *magnetic induction probes*  
GS measuring instruments  
. **magnetic probes**  
RT magnetic force microscopy  
magnetometers  
resonance probes  
space probes
- magnetic properties**  
GS **magnetic properties**  
. antiferromagnetism  
. biomagnetism  
. Curie temperature  
. diamagnetism  
. ferrimagnetism  
. ferromagnetism  
. geomagnetism  
. gyromagnetism  
. . gyrofrequency  
. magnetic effects  
. . magnetic damping  
. . magnetic rigidity  
. magnetic induction  
. magnetic moments  
. magnetic permeability  
. magnetic relaxation  
. . spin-lattice relaxation  
. magnetic suspension  
. magnetoacoustics  
. magnetoactivity  
. . flux transfer events  
. . magnetic field reconnection  
. . magnetoconductivity  
. magnetostriction  
. paleomagnetism  
. paramagnetism  
. polarization characteristics  
. reluctance  
. remanence  
. thermomagnetic effects  
RT coercivity  
Curie-Weiss law  
dipole moments  
eddy currents  
electrical properties  
electromagnetic properties  
electromagnetism  
ferritic stainless steels  
field strength  
hysteresis  
inductance  
KP index  
lines of force  
magnetization  
magnetomechanics (physics)  
magnets  
Maxwell equation  
∞ physical properties  
polarization (spin alignment)  
∞ properties  
∞ solid state physics  
spin glass
- magnetic pumping**  
RT electron cyclotron heating  
induction heating  
ion cyclotron radiation  
kinetic heating  
plasma heating  
∞ pumping
- magnetic recording**  
UF *magnetic tape recorders*  
GS recording  
. **magnetic recording**  
RT bubble memory devices  
data recording  
recording heads
- magnetic relaxation**  
GS magnetic properties  
. **magnetic relaxation**  
. . spin-lattice relaxation

## magnetic resonance

RT relaxation (mechanics)

### magnetic resonance

GS resonance  
. **magnetic resonance**  
. . ferromagnetic resonance  
. . nuclear magnetic resonance  
. . . proton magnetic resonance  
. . . proton resonance  
. . paramagnetic resonance  
. . . electron paramagnetic resonance  
RT magnetic force microscopy  
magnetic resonance spectroscopy  
nuclear spin  
Overhauser effect  
spectrum analysis

### magnetic resonance spectroscopy

(added August 2004)

DEF Spectroscopic method of measuring the magnetic moment of elementary particles such as atomic nuclei, protons or electrons. It is employed in clinical applications such as NMR Tomography ( magnetic resonance imaging).

GS spectroscopy  
. magnetic spectroscopy  
. . **magnetic resonance spectroscopy**  
RT chemical analysis  
magnetic resonance

### magnetic rigidity

UF *gyrointeraction*  
GS magnetic properties  
. magnetic effects  
. . **magnetic rigidity**  
RT electron trajectories  
ionospheric drift  
particle mass  
particle motion  
∞ rigidity

### magnetic sails

(added May 1995)

DEF Devices that provide low thrust spacecraft propulsion by deflecting plasma winds with a superconducting cable-generated magnetic field.

UF *field sails*  
*magsails*  
GS propulsion  
. electric propulsion  
. . electromagnetic propulsion  
. . . **magnetic sails**  
. . low thrust propulsion  
. . . electromagnetic propulsion  
. . . **magnetic sails**  
. . spacecraft propulsion  
. . . electromagnetic propulsion  
. . . **magnetic sails**  
sails  
. **magnetic sails**  
RT interplanetary flight  
interstellar travel  
ion propulsion  
manned Mars missions  
particle beams  
plasma propulsion  
solar wind

### magnetic shielding

GS shielding  
. **magnetic shielding**  
RT electromagnetic shielding  
magnetometers  
radiation shielding

### magnetic signals

RT nuclear magnetic resonance  
signal mixing  
∞ signals

### magnetic signatures

UF *magnetograms*  
GS signatures  
. **magnetic signatures**  
RT pattern registration

### magnetic spectroscopy

GS spectroscopy

. **magnetic spectroscopy**  
. . magnetic resonance spectroscopy  
RT Alpha Magnetic Spectrometer  
gas spectroscopy  
mass spectroscopy  
spectroscopic analysis  
vacuum spectroscopy

### magnetic stars

GS celestial bodies  
. stars  
. . **magnetic stars**  
. . . magnetars  
RT peculiar stars

### magnetic storage

DEF In computer terminology, any device which makes use of the magnetic properties of materials for the storage of information. Used for magnetic memories.

UF *magnetic memories*  
GS **magnetic storage**  
. bubble memory devices  
. core storage  
. magnetic disks  
. magnetic drums  
RT computer storage devices  
data recording  
data storage  
∞ drums  
parametrons  
∞ storage  
virtual memory systems

### magnetic storms

DEF Worldwide disturbances of the Earth's magnetic field. Used for geomagnetic storms and magnetic substorms.

UF *geomagnetic storms*  
*magnetic substorms*  
GS magnetic disturbances  
. **magnetic storms**  
. . polar substorms  
storms  
. **magnetic storms**  
. . polar substorms  
RT Birkeland currents  
dawn chorus  
Forbush decreases  
IMAGE satellite  
noise storms  
solar storms  
solar terrestrial interactions  
space weather  
spread F  
sudden ionospheric disturbances  
sudden storm commencements

### *magnetic substorms*

USE **magnetic storms**

### magnetic surveys

UF *magnetotelluric profiling*  
RT aeromagnetism  
geomagnetism

### *magnetic susceptibility*

USE **magnetic permeability**

### magnetic suspension

UF *electromagnetic levitation*  
*electrostatic levitation*  
GS magnetic properties  
. **magnetic suspension**  
suspending (hanging)  
. **magnetic suspension**  
RT annular suspension and pointing  
system  
levitation melting  
magnetic bearings

### magnetic switching

GS switching  
. **magnetic switching**  
RT antiferromagnetism  
beam switching  
bubble memory devices

saturable reactors

### *magnetic tape recorders*

USE **magnetic recording tape recorders**

### magnetic tape transports

GS mechanical drives  
. **magnetic tape transports**  
RT tape recorders

### magnetic tapes

DEF Ribbons of paper, metal, or plastic, coated or impregnated with magnetic material on which information may be stored in the form of magnetically polarized areas.

GS **magnetic tapes**  
. computer compatible tapes  
RT audio tapes  
peripheral equipment (computers)  
plastic tapes  
playbacks  
punched tapes  
readers  
recording heads  
reels  
tape recorders  
∞ tapes  
video tapes

### magnetic transducers

GS transducers  
. **magnetic transducers**  
RT electromagnetic measurement  
electronic transducers  
microphones

### magnetic variations

DEF Changes in magnetic fields in time or space.

GS variations  
. **magnetic variations**  
. . geomagnetic pulsations  
. . . geomagnetic micropulsations  
. . . nocturnal variations  
RT aeromagnetism  
annual variations  
diurnal variations  
ionospheric disturbances  
KP index  
Scylla  
traveling ionospheric disturbances

### magnetically trapped particles

GS particles  
. charged particles  
. . **magnetically trapped particles**  
. . . radiation belts  
. . . . artificial radiation belts  
. . . . inner radiation belt  
. . . . outer radiation belt  
. . . . proton belts  
. . . trapped particles  
. . **magnetically trapped particles**  
. . . radiation belts  
. . . . artificial radiation belts  
. . . . inner radiation belt  
. . . . outer radiation belt  
. . . . proton belts  
RT plasma control  
trapped magnetic fields

### magnetite

GS chalcogenides  
. oxides  
. . metal oxides  
. . . iron oxides  
. . . . **magnetite**  
iron compounds  
. iron oxides  
. . **magnetite**  
magnetic materials  
. ferromagnetic materials  
. . **magnetite**  
minerals  
. **magnetite**

### magnetization

UF *remagnetization*  
RT coercivity

- magnetic dispersion
  - magnetic fields
  - magnetic properties
  - magnetomechanics (physics)
  - magnets
  - magnons
  - ∞ polarization
  - polarization (charge separation)
  - polarization (spin alignment)
- magnetoacoustic waves**
  - GS elastic waves
    - . magnetoelastic waves
    - . . **magnetoacoustic waves**
  - RT magneto hydrodynamic waves
  - plasma waves
- magnetoacoustics**
  - GS acoustics
    - . **magnetoacoustics**
  - magnetic properties
  - . **magnetoacoustics**
- magnetoactivity**
  - GS magnetic properties
    - . **magnetoactivity**
    - . . flux transfer events
    - . . magnetic field reconnection
    - . . magneto resistivity
  - RT magnetic effects
  - magnetic fields
- magnetocardiography**
  - GS bioengineering
    - . biometrics
    - . . cardiology
    - . . . **magnetocardiography**
  - RT bioinstrumentation
- magnetoelastic vibrations*
  - USE **magnetoelastic waves**
- magnetoelastic waves**
  - UF *magnetoelastic vibrations*
  - GS elastic waves
    - . **magnetoelastic waves**
    - . . magnetoacoustic waves
  - RT electrostatic waves
  - magnetosonic resonance
  - magnetospheric instability
  - magnetostriction
  - plasma waves
  - sound waves
  - ultrasonic radiation
- magnetoelasticity*
  - USE **magnetostriction**
- magneto electric media**
  - RT dielectrics
  - magnetoionics
  - Maxwell equation
  - mechanical drives
- magnetogas dynamics*
  - USE **magnetohydrodynamics**
- magnetograms*
  - USE **magnetic signatures**
- magneto hydrodynamic acceleration*
  - USE **plasma acceleration**
- magnetohydrodynamic flow**
  - UF *hydromagnetic flow*
  - plasma flow*
  - GS fluid flow
    - . **magnetohydrodynamic flow**
  - RT compressible flow
    - core flow
    - gas flow
    - geomagnetic hollow
    - Hartmann flow
    - Kelvin-Helmholtz instability
    - line current
    - magnetohydrodynamic simulation
    - magnetohydrodynamics
    - plasma flux measurement
    - plasma turbulence
    - plasmas (physics)
    - reverse field pinch
- screw pinch
- solar wind velocity
- transverse waves
- two fluid models
- magnetohydrodynamic generators**
  - GS electric generators
    - . direct power generators
    - . . **magnetohydrodynamic generators**
  - RT fuel cells
    - ∞ generators
    - magnetohydrodynamics
    - plasma accelerators
    - plasma generators
    - thermionic converters
    - thermoelectric generators
- magnetohydrodynamic shear heating**
  - GS heating
    - . **magnetohydrodynamic shear heating**
  - RT plasma heating
  - plasma sheaths
  - shock heating
  - viscous flow
- magnetohydrodynamic simulation**
  - (added June 2005)
  - DEF Simulation of the interaction that exists between a magnetic field and an electrically conducting fluid.
  - GS simulation
    - . **magnetohydrodynamic simulation**
  - RT magnetohydrodynamic flow
  - magnetohydrodynamics
  - meshfree methods
  - plasma turbulence
  - turbulence models
- magnetohydrodynamic stability**
  - UF *hydromagnetic stability*
  - plasma instability*
  - plasma stability*
  - GS dynamic characteristics
    - . dynamic stability
    - . . motion stability
    - . . . flow stability
    - . . . . **magnetohydrodynamic stability**
    - . . . . . Weibel instability
    - . . . . flow characteristics
    - . . . . flow stability
    - . . . . **magnetohydrodynamic stability**
    - . . . . . Weibel instability
    - . . . . stability
    - . . . . dynamic stability
    - . . . . motion stability
    - . . . . flow stability
    - . . . . **magnetohydrodynamic stability**
    - . . . . . Weibel instability
  - RT ballooning modes
  - beta factor
  - elastic waves
  - elliptical plasmas
  - force-free magnetic fields
  - helical flow
  - Kelvin-Helmholtz instability
  - Langmuir turbulence
  - magnetohydrodynamics
  - magnetohydrostatics
  - nonequilibrium plasmas
  - nonuniform plasmas
  - plasma conductivity
  - plasma cooling
  - plasma decay
  - plasma drift
  - plasma equilibrium
  - plasma lifetime
  - plasma loss
  - plasma pinch
  - plasma potentials
  - plasma slabs
  - plasma temperature
  - plasma turbulence
  - plasmas (physics)
  - plasmons
  - space plasmas
  - strongly coupled plasmas
- thermal instability
- zeta pinch
- magnetohydrodynamic turbulence**
  - GS turbulence
    - . **magnetohydrodynamic turbulence**
    - . . plasma turbulence
    - . . . Langmuir turbulence
  - RT homogeneous turbulence
  - isotropic turbulence
- magnetohydrodynamic waves**
  - DEF Low frequency waves in an electrically highly conducting fluid (such as a plasma) permeated by static magnetic fields. The restoring forces of the waves are, in general, the combination of a magnetic tensile stress along the magnetic field lines and the comprehensive stress between the field lines and the fluid pressure. Used for Alfvén waves, hydromagnetic waves, and plasma sound waves.
  - UF *Alfvén waves*
  - hydromagnetic waves*
  - plasma sound waves*
  - GS elastic waves
    - . **magnetohydrodynamic waves**
    - . . plasma waves
    - . . . electrostatic waves
  - RT magnetoacoustic waves
  - magnetohydrodynamics
  - normal shock waves
  - oblique shock waves
  - shock waves
  - wave-particle interactions
- magnetohydrodynamics**
  - DEF The study of the interaction that exists between a magnetic field and an electrically conducting fluid. Used for geometrical hydro-magnetics, hydromagnetics, hydromagnetism, and magnetogas dynamics.
  - UF *geometrical hydromagnetics*
  - hydromagnetics*
  - hydromagnetism*
  - magnetogas dynamics*
  - GS mechanics (physics)
    - . fluid mechanics
    - . . fluid dynamics
    - . . . hydrodynamics
    - . . . . **magnetohydrodynamics**
    - . . . . hydromechanics
    - . . . . hydrodynamics
    - . . . . **magnetohydrodynamics**
  - RT alpha plasma devices
    - conducting fluids
    - ∞ dynamics
    - electric arcs
    - electrohydrodynamics
    - gas dynamics
    - gas transport
    - Hall accelerators
    - Hall effect
    - Hartmann flow
    - Hartmann number
    - ionization
    - magnetohydrodynamic flow
    - magnetohydrodynamic generators
    - magnetohydrodynamic simulation
    - magnetohydrodynamic stability
    - magnetohydrodynamic waves
    - magnetohydrostatics
    - magnetoionics
    - magnetosonic resonance
    - pinch effect
    - plasma currents
    - plasma dynamics
    - plasma physics
    - plasma propulsion
    - plasmas (physics)
    - space charge
    - space mechanics
    - space plasmas
    - stellar activity
    - stellarators
    - thermonuclear reactions
    - uranium plasmas
    - wave-particle interactions
- magnetohydrostatics**
  - GS mechanics (physics)

## magnetoionics

- . fluid mechanics
- . . . hydromechanics
- . . . . hydrostatics
- . . . . . **magneto-hydrostatics**
- statics
- . hydrostatics
- . . **magneto-hydrostatics**

RT magnetohydrodynamic stability  
magnetohydrodynamics  
magnetoionics  
plasma physics  
static stability

### *magnetoionic plasma*

USE **plasmas (physics)**

### magnetoionics

RT electromagnetic wave transmission  
elliptical polarization  
geomagnetism  
gyrofrequency  
ionospheric propagation  
magnetolectric media  
magnetohydrodynamics  
magneto-hydrostatics  
plasmas (physics)  
radio transmission

### magnetomechanics (physics)

DEF Study of the effects which the magnetization of a material and its strain have on each other.

RT magnetic properties  
magnetization

∞ physics

### magnetometers

DEF Instruments used in the study of geomagnetism for measuring a magnetic element. Used for Gaussmeters.

UF *Gaussmeters*

GS measuring instruments  
. **magnetometers**  
. . . variometers

RT electrical measurement  
field intensity meters  
geomagnetism

∞ gradiometers  
magnetic measurement  
magnetic probes  
magnetic shielding  
MagSat 1 satellite  
Magsat A satellite  
MagSat B satellite  
MagSat satellites  
nuclear magnetic resonance  
proton masers

### *magnetometry*

USE **magnetic measurement**

### magneto-optics

RT acousto-optics  
electromagnetic radiation  
electro-optics  
Faraday effect  
Kerr magneto-optical effect  
light modulators  
magnetic fields  
optical switching

∞ optics  
polarization (waves)  
polarized electromagnetic radiation

### magnetopause

GS environments  
. Earth magnetosphere  
. . **magnetopause**

RT Chapman-Ferraro problem  
flux transfer events  
IMAGE satellite  
magnetosheath  
magnetospheric instability  
planetary magnetotails  
polar cusps  
satellite atmospheres  
solar wind

### magnetoplasma dynamic thrusters

(added April 2001)

DEF Electromagnetic rocket engines that produce thrust via the Lorentz body force ejecting a high velocity plasma stream. The thrusters can be operated in either steady-state or pulsed mode, and typically have an axisymmetric geometry (annular anode surrounding a central cathode).

UF *LFA thrusters*  
*Lorentz force accelerator thrusters*  
*MPD thrusters*

GS engines  
. rocket engines  
. . electric rocket engines  
. . . plasma engines  
. . . . **magnetoplasma dynamic thrusters**

RT arc jet engines  
electromagnetic propulsion  
magnetoplasma dynamics  
plasma accelerators  
plasma propulsion  
spacecraft propulsion

∞ thrusters

### magnetoplasma dynamics

DEF The study of the dynamics of generating electricity by passing a beam of ionized gas through a magnetic field.

RT magnetic fields  
magnetoplasma dynamic thrusters  
plasma density  
plasma propulsion  
rocket engines  
spacecraft propulsion

### *magnetoplasmas*

USE **plasmas (physics)**

### magneto-resistivity

GS electrical properties  
. electrical resistivity  
. . **magneto-resistivity**  
electromagnetic properties  
. **magneto-resistivity**  
magnetic properties  
. magnetoactivity  
. . **magneto-resistivity**  
transport properties  
. electrical resistivity  
. . **magneto-resistivity**

RT ∞ conductivity  
electromagnetism  
Fermi surfaces  
Hall resistance  
magnetic fields  
reluctance

∞ resistance

### magnetorheological fluids

(added September 2000)

DEF Fluids comprised of magnetically soft particles dispersed in liquids and possessing rheological properties that can be rapidly and reversibly altered by the application of a magnetic field.

RT electrorheological fluids  
ferrofluids  
ferromagnetic materials

∞ fluids  
magnetic materials  
rheology  
smart materials  
vibration damping

### magnetosheath

GS environments  
. Earth magnetosphere  
. . **magnetosheath**

RT bow waves  
Earth environment  
geomagnetism  
magnetopause  
plasma sheaths  
shock fronts  
solar planetary interactions  
solar terrestrial interactions  
solar wind

### magnetosonic resonance

GS resonance

. **magnetosonic resonance**

RT magnetoelastic waves  
magnetohydrodynamics

### magnetosphere-ionosphere coupling

UF *ionosphere-magnetosphere coupling*

GS coupling  
. **magnetosphere-ionosphere coupling**

RT aeronomy  
atmospheric physics  
coupled modes  
Earth ionosphere  
Earth magnetosphere  
electromagnetic coupling  
flux transfer events

∞ ionospheres  
magnetic field reconnection  
magnetospheric instability  
planetary ionospheres

### ∞ magnetospheres

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Region surrounding a celestial body where its magnetic field controls the motions of charged particles.

RT cometary magnetospheres  
Earth magnetosphere  
planetary magnetospheres  
pulsar magnetospheres  
stellar magnetospheres

### magnetospheric electron density

GS density (number/volume)  
. particle density (concentration)  
. . electron density (concentration)  
. . . **magnetospheric electron density**

RT atmospheric density  
ionospheric electron density  
plasma density

### magnetospheric instability

GS stability  
. **magnetospheric instability**

RT geomagnetic pulsations  
magnetoelastic waves  
magnetopause  
magnetosphere-ionosphere coupling

### magnetospheric ion density

GS density (number/volume)  
. particle density (concentration)  
. . ion density (concentration)  
. . . **magnetospheric ion density**  
. . . . magnetospheric proton density

RT atmospheric density  
ionospheric ion density  
plasma density  
positive ions

### magnetospheric proton density

GS density (number/volume)  
. particle density (concentration)  
. . ion density (concentration)  
. . . magnetospheric ion density  
. . . . **magnetospheric proton density**  
. . . . proton density (concentration)  
. . . . . **magnetospheric proton density**

RT atmospheric density  
plasma density

### magnetostatic amplifiers

GS amplifiers  
. **magnetostatic amplifiers**

RT gadolinium-gallium garnet  
magnetic amplifiers  
parametric amplifiers  
traveling wave tubes  
yttrium-aluminum garnet  
yttrium-iron garnet

### magnetostatic fields

GS magnetic fields  
. **magnetostatic fields**

RT field theory (physics)

lines of force

**magnetostatics**

- GS electromagnetism
- . **magnetostatics**
- RT electrostatics
- flux (rate)
- magnetic fields

**magnetostratigraphy**

- (added April 1999)
- GS stratigraphy
- . **magnetostratigraphy**
- RT geochronology
- paleomagnetism

**magnetostriction**

DEF The phenomenon wherein ferromagnetic materials experience an elastic strain when subjected to an external magnetic field. The converse in which mechanical stresses cause a change in the magnetic induction of a ferromagnetic material. Used for magnetoelasticity.

- UF *magnetoelasticity*
- GS magnetic properties
- . **magnetostriction**
- mechanical properties
- . elastic properties
- . . **magnetostriction**
- RT electrostriction
- magnetoelastic waves

∞ **magnetotails**

- (added April 1990)
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED-CONSULT TERMS LISTED BELOW)
- RT geomagnetic tail
- planetary magnetotails

*magnetotelluric profiling*

USE **magnetic surveys**

*magnetovariographs*

USE **variometers**

**magnetron sputtering**

DEF A deposition method in which a microwave tube is utilized to confine a plasma magnetically to produce high deposition rates and a low working-gas partial pressure.

- GS sputtering
- . **magnetron sputtering**
- RT deposition
- metal coatings

**magnetrons**

DEF Electron tubes characterized by the interaction of electrons with the electric field of a circuit element in crossed steady electric and magnetic fields to produce alternating current power output.

- GS electron tubes
- . vacuum tubes
- . . microwave tubes
- . . . **magnetrons**
- . . . . nigtotrons
- microwave equipment
- . microwave oscillators
- . . **magnetrons**
- . . . nigtotrons
- . microwave tubes
- . . **magnetrons**
- . . . nigtotrons
- oscillators
- . microwave oscillators
- . . **magnetrons**
- . . . nigtotrons
- RT cavity resonators
- crossed field amplifiers
- crossed fields
- electrostatic generators
- klystrons
- multimode resonators
- planotrons
- resonators

traveling wave tubes

**magnets**

DEF Bodies which produce magnetic fields around themselves.

- GS **magnets**
- . cryogenic magnets
- . electromagnets
- . . high field magnets
- . . superconducting magnets
- . ferrimagnets
- . permanent magnets
- . wiggler magnets
- RT electrets
- ferromagnetic materials
- ferromagnetism
- magnet coils
- magnetic cores
- magnetic fields
- magnetic materials
- magnetic properties
- magnetization
- Permalloys (trademark)

**magnification**

DEF A ratio of the size of an image to its corresponding object. This is usually determined by linear measurement. Used for magnifiers.

- UF *magnifiers*
- RT amplification
- increasing
- lenses
- ∞ projection

*magnifiers*

USE **magnification**

**magnitude**

- GS **magnitude**
- . stellar magnitude
- RT amplitudes
- dimensions
- displacement
- ∞ intensity
- level (quantity)

**magnons**

- UF *spin waves*
- GS elementary excitations
- . **magnons**
- RT antiferromagnetism
- ferrimagnetism
- ferromagnetism
- magnetization
- plasmons

**Magnus effect**

- RT Bernoulli theorem
- boundary layer flow
- ∞ effects
- fluid dynamics
- fluid flow
- missile design
- rotating cylinders

*magsails*

USE **magnetic sails**

**MagSat 1 satellite**

DEF A scientific satellite launched by NASA for surveying the Earth's magnetic field. It was launched in October 1979 and reentered in June 1980.

- GS artificial satellites
- . scientific satellites
- . . MagSat satellites
- . . . **MagSat 1 satellite**
- RT geomagnetism
- magnetometers

**Magsat A satellite**

- GS artificial satellites
- . scientific satellites
- . . MagSat satellites
- . . . **Magsat A satellite**
- RT geomagnetism
- magnetometers

**MagSat B satellite**

DEF The second in a series of satellites for

measuring the Earth's magnetic field. Similar magnetic measurements are proposed as part of the Geopotential Research Mission.

- GS artificial satellites
- . scientific satellites
- . . MagSat satellites
- . . . **MagSat B satellite**
- RT geomagnetism
- magnetometers

**MagSat satellites**

DEF A series of satellites used to study the magnetic field.

- GS artificial satellites
- . scientific satellites
- . . **MagSat satellites**
- . . . MagSat 1 satellite
- . . . Magsat A satellite
- . . . MagSat B satellite
- RT geomagnetism
- magnetometers

**main sequence stars**

- GS celestial bodies
- . stars
- . . **main sequence stars**
- . . . dwarf stars
- . . . . dwarf novae
- . . . . flare stars
- . . . . red dwarf stars
- . . sun
- RT color-magnitude diagram
- early stars
- F stars
- G stars
- giant stars
- K stars
- late stars
- M stars
- pre-main sequence stars
- stellar evolution
- stellar mass
- subdwarf stars
- subgiant stars

**Maine**

- GS nations
- . United States
- . . **Maine**
- RT St Lawrence Valley (North America)

**maintainability**

DEF A measure of the ease and rapidity with which a system or equipment can be retained in operational status through preventive maintenance or restored to operational status following a failure. It is characteristic of equipment design and installation, personnel availability in the required skill levels, adequacy of maintenance procedures and test equipment, and the physical environment under which maintenance is performed.

- RT design analysis
- maintenance
- reliability

**maintenance**

- UF *repairing*
- troubleshooting*
- GS **maintenance**
- . aircraft maintenance
- . file maintenance (computers)
- . preventive maintenance
- . space maintenance
- . spacecraft maintenance
- RT checkout
- construction
- damage assessment
- downtime
- equipment specifications
- fault detection
- ∞ fixing
- ground crews
- ground support equipment
- installing
- logistics
- logistics management
- lubricants
- lubrication
- maintainability



## maintenance training

manuals  
mechanical engineering  
operating costs  
reliability  
replacing  
self repairing devices  
service life  
shipyards  
shops  
spare parts  
specifications

### maintenance training

GS education  
. **maintenance training**

### majority carriers

GS charge carriers  
. **majority carriers**  
RT additives  
bipolar transistors  
carrier injection  
electron mobility  
electrons  
holes (electron deficiencies)  
semiconductors (materials)

### Malagasy Republic

USE **Madagascar**

### Malawi

GS nations  
. **Malawi**  
RT Africa

### Malaya

USE **Malaysia**

### Malaysia

UF *Malaya*  
GS nations  
. **Malaysia**  
RT Asia

### Maldivé Islands

GS landforms  
. islands  
. . **Maldivé Islands**  
nations  
. **Maldivé Islands**

### maleates

GS esters  
. **maleates**

### males

RT adults  
children  
females  
human beings  
sex  
sex factor

### malfunctions

DEF Improper functioning of components, causing improper operation of a system.  
RT aborted missions  
aircraft accidents  
aircraft hazards  
downtime  
errors  
failure  
system failures

### Mali

GS nations  
. **Mali**  
RT Africa

### Malkus theory

RT statistical mechanics  
∞ theories

### malleability

GS mechanical properties  
. **malleability**  
RT ductility  
metal working

### malononitrile

GS cyanides

. **malononitrile**  
nitrogen compounds  
. nitriles  
. . **malononitrile**  
organic compounds  
. nitriles  
. . **malononitrile**

### Malta

GS landforms  
. islands  
. . **Malta**  
nations  
. **Malta**  
RT Mediterranean Sea

### mammals

GS animals  
. vertebrates  
. . **mammals**  
. . . bats  
. . . bears  
. . . cats  
. . . cattle  
. . . calves  
. . . deer  
. . . . caribous  
. . . goats  
. . . horses  
. . . marine mammals  
. . . . dolphins  
. . . . manatees  
. . . . porpoises  
. . . . seals (animals)  
. . . . whales  
. . . moles  
. . . primates  
. . . apes  
. . . . chimpanzees  
. . . . baboons  
. . . . human beings  
. . . . monkeys  
. . . rodents  
. . . . guinea pigs  
. . . . hamsters  
. . . . mice  
. . . . . jerboas  
. . . . . knockout mice  
. . . . . pocket mice  
. . . . . rabbits  
. . . . . rats  
. . . . . squirrels  
. . . . . ground squirrels  
. . . dogs  
. . . sheep  
. . . swine  
. . . wolves  
RT Earth resources  
homeotherms  
mammary glands

### mammary glands

GS anatomy  
. chest  
. . breast  
. . . **mammary glands**  
. . . glands (anatomy)  
. . **mammary glands**  
RT mammals

### man

USE **human beings**

### man environment interactions

RT biomass burning  
climate change  
desertification  
environment effects  
environment management  
human beings  
∞ interactions  
International Geosphere-Biosphere program  
resources

### man machine systems

DEF Systems in which the functions of the man and the machine are interrelated and necessary for the operation of the system.  
GS **man machine systems**

. human-computer interface  
RT astronaut performance  
∞ automation  
balancing  
bionics  
biotechnology  
computer systems design  
consoles  
cybernetics  
data processing terminals  
depersonalization  
display devices  
∞ engineering  
human factors engineering  
management  
mechanization  
office automation  
pilot induced oscillation  
pilot support systems  
robotics  
∞ systems  
systems analysis  
systems engineering  
systems management  
teleoperators  
virtual reality  
workstations

### man operated propulsion systems

UF *MOPS (propulsion systems)*  
GS propulsion  
. low thrust propulsion  
. . **man operated propulsion systems**  
RT astronaut locomotion  
compressed air  
extravehicular activity  
gaseous rocket propellants  
manned space flight  
pilot performance  
retrorocket engines  
∞ systems

### man powered aircraft

DEF Aircraft powered by human energy.  
RT ∞ aircraft  
hang gliders  
soaring  
ultralight aircraft  
∞ winged vehicles

### man tended free flyers

(added July 1989)  
DEF Intermittently manned spacecraft or platforms designed primarily to carry out experiments in reduced gravity and life science research. They also serve as annexes or components of space stations. Used for MTFF (space station).  
UF *MTFF (space station)*  
GS artificial satellites  
. space stations  
. . **man tended free flyers**  
manned spacecraft  
. **man tended free flyers**  
space platforms  
. **man tended free flyers**  
stations  
. space stations  
. . **man tended free flyers**  
RT Columbus space station  
European space programs  
orbital servicing  
space station payloads  
spaceborne experiments  
spacecraft modules

### management

UF *administration*  
GS **management**  
. configuration management  
. contract management  
. data management  
. environment management  
. financial management  
. industrial management  
. . engineering management  
. . inventory management  
. . . inventory controls  
. . personnel management

- . information management
- . . information resources management
- . . records management
- . logistics management
- . . inventory management
- . . . inventory controls
- . matrix management
- . procurement management
- . production management
- . project management
- . research management
- . resources management
- . . forest management
- . . . reforestation
- . . information resources management
- . . land management
- . . resource allocation
- . safety management
- . systems management
- . terminal area energy management
- . total quality management
- . waste management
- . water management
- . weapon system management
- . . waste disposal
- . . . composting
- . . . hazardous material disposal (in space)
- . . waste treatment
- . . . sewage treatment
- . . waste utilization
- . risk management
- RT autonomy
- Central Electronic Management System
- command and control
- contract negotiation
- cost analysis
- cost estimates
- cost incentives
- cost reduction
- cybernetics
- decision making
- decisions
- ∞ direction
- economic analysis
- economic factors
- evaluation
- fiduciaries
- forecasting
- GERT
- incentive techniques
- incentives
- information flow
- man machine systems
- marketing
- mission planning
- operations research
- performance prediction
- personnel development
- prejudices
- problem solving
- procurement policy
- product development
- production engineering
- progress
- project planning
- ∞ research projects
- statistical analysis
- systems engineering
- management analysis**
- RT ∞ analyzing
- cost analysis
- GERT
- PERT
- tradeoffs
- management information systems**
- GS information systems
- . **management information systems**
- management systems
- . **management information systems**
- RT computer techniques
- data base management systems
- data retrieval
- data storage
- data systems
- information retrieval
- information theory
- records management
- ∞ systems
- management methods**
- GS **management methods**
- . Delphi method (forecasting)
- . pattern method (forecasting)
- . probe method (forecasting)
- . profile method (forecasting)
- RT computer techniques
- cost reduction
- critical path method
- decision making
- estimates
- forecasting
- GERT
- incentives
- matrix management
- ∞ methodology
- multidisciplinary research
- NASA Interactive Planning System
- operations research
- PERT
- retraining
- Starsite program
- systems management
- total quality management
- management planning**
- GS planning
- . **management planning**
- . . production planning
- . . project planning
- RT consulting
- cost analysis
- cost reduction
- decision making
- ∞ development
- economy
- estimates
- feasibility analysis
- finance
- forecasting
- GERT
- human resources
- interfaces
- life cycle costs
- mediation
- mission planning
- operations research
- personnel management
- PERT
- program trend line analysis
- project management
- research and development
- selective dissemination of information
- systems engineering
- tradeoffs
- value engineering
- management systems**
- GS **management systems**
- . flight management systems
- . management information systems
- RT computer techniques
- information systems
- project management
- ∞ systems
- manatees**
- DEF Large plant eating aquatic mammals living in shallow tropical waters near the coasts of North and South America.
- GS animals
- . vertebrates
- . . mammals
- . . . marine mammals
- . . . . **manatees**
- man-computer interface*
- USE **human-computer interface**
- Mandelstam representation**
- GS models
- . mathematical models
- . . **Mandelstam representation**
- RT elementary particle interactions
- inelastic scattering
- Lorentz transformations
- nuclear scattering
- quantum theory
- scattering amplitude
- mandrels**
- RT cores
- machine tools
- molds
- shafts (machine elements)
- maneuverability**
- RT air slew missiles
- aircraft control
- aircraft maneuvers
- aircraft performance
- controllability
- flight characteristics
- flight control
- flight envelopes
- helicopter performance
- maneuvers
- spacecraft maneuvers
- maneuverable reentry bodies**
- DEF (1) Reentry vehicles capable of performing preplanned flight maneuvers during the reentry phase. (2) Ballistic missile reentry vehicles whose ballistic trajectory can be adjusted by internal or external mechanisms, enabling them to evade antiballistic defenses and/or strike their target with a high degree of accuracy.
- GS reentry vehicles
- . **maneuverable reentry bodies**
- . . lifting reentry vehicles
- . . . FDL-5 reentry vehicle
- . . . HL-10 reentry vehicle
- . . . HLD-35 reentry vehicle
- . . . Janus spacecraft
- . . . M-2 lifting body
- . . . . M-2F2 lifting body
- . . . X-20 aircraft
- . . . X-24 aircraft
- RT ∞ bodies
- maneuverable spacecraft**
- GS **maneuverable spacecraft**
- . aerospace planes
- . . HOPE aerospace plane
- . . HOTOL launch vehicle
- . . VentureStar launch vehicle
- . . X-30 vehicle
- . . X-37 vehicle
- . . X-40A vehicle
- . Apollo spacecraft
- . . Apollo lunar experiment module
- . Astro vehicle
- . evasive satellites
- . ferry spacecraft
- . Janus spacecraft
- . rendezvous spacecraft
- . X-20 aircraft
- RT artificial satellites
- interplanetary spacecraft
- landing modules
- lunar landing modules
- lunar probes
- lunar satellites
- manned spacecraft
- MARS (Manned Reusable Spacecraft)
- recoverable spacecraft
- reentry vehicles
- space probes
- ∞ spacecraft
- spacecraft maneuvers
- thrust vector control
- maneuvers**
- GS **maneuvers**
- . aircraft maneuvers
- . docking
- . evasive actions
- . hovering
- . . autonomous docking
- . . offshore docking
- . . spacecraft docking
- . . spacecraft maneuvers
- . . spacecraft docking
- . orbital maneuvers
- . terrain following

## manganese

- . . orbital rendezvous
- . . . Earth orbital rendezvous
- . . . lunar orbital rendezvous
- RT aerobatics
- aircraft spin
- flight control
- landing
- maneuverability
- minor circle turning flight
- rendezvous
- self maneuvering units
- sideslip
- takeoff
- turning flight

### manganese

- GS chemical elements
- . **manganese**
- . . manganese isotopes
- metals
- . transition metals
- . . **manganese**
- . . . manganese isotopes
- RT strategic materials

### manganese 53

USE **manganese isotopes**

### manganese 54

USE **manganese isotopes**

### manganese 56

USE **manganese isotopes**

### manganese alloys

- GS alloys
- . **manganese alloys**
- . . Manganin (trademark)

### manganese compounds

- GS **manganese compounds**
- . manganese oxides
- . . Hopcalite (trademark)
- . manganese phosphides
- . permanganates
- RT  $\infty$  chemical compounds
- $\infty$  Group 7B compounds
- $\infty$  metal compounds

### manganese ions

- GS ions
- . metal ions
- . . **manganese ions**
- RT permanganates

### manganese isotopes

- UF *manganese 53*
- manganese 54*
- manganese 56*
- GS chemical elements
- . manganese
- . . **manganese isotopes**
- . nuclides
- . . isotopes
- . . . **manganese isotopes**
- metals
- . transition metals
- . . manganese
- . . . **manganese isotopes**

### manganese oxides

- GS chalcogenides
- . oxides
- . . metal oxides
- . . . **manganese oxides**
- . . . Hopcalite (trademark)
- manganese compounds
- . **manganese oxides**
- . . Hopcalite (trademark)

### manganese phosphides

- GS manganese compounds
- . **manganese phosphides**
- phosphorus compounds
- . phosphides
- . . **manganese phosphides**

### Manganin (trademark)

- GS alloys
- . copper alloys
- . . **Manganin (trademark)**

- . manganese alloys
- . . **Manganin (trademark)**
- RT electrical resistance
- thermocouples

### manifolds

- RT air intakes
- exhaust systems
- fuel systems
- intake systems
- pipes (tubes)
- plenum chambers
- $\infty$  tubes
- $\infty$  water intakes

### manifolds (mathematics)

- GS **manifolds (mathematics)**
- . Riemann manifold
- RT coordinates
- curves (geometry)
- fibers (mathematics)
- fixed points (mathematics)
- topology

### manipulation

USE **manipulators**

### manipulators

- SN (LIMITED TO MECHANICAL DEVICES FOR REMOTE HANDLING)
- UF *manipulation*
- GS **manipulators**
- . remote manipulator system
- . . Space Station Mobile Servicing System
- RT control equipment
- $\infty$  effectors
- end effectors
- inverse kinematics
- payload deployment & retrieval system
- remote control
- remote handling
- robot arms
- robot dynamics
- robotics
- servocontrol
- shielding
- tactile sensors (robotics)
- teleoperators
- telerobotics
- torque sensors (robotics)

### Manitoba

- GS nations
- . Canada
- . . **Manitoba**

### Manitou (CO)

- GS cities
- . **Manitou (CO)**
- RT Colorado

### Manned Aerodynamic Reusable Spaceship

USE **MARS (Manned Reusable Spacecraft)**

### manned lunar surface vehicles

- GS surface vehicles
- . lunar surface vehicles
- . . lunar roving vehicles
- . . . **manned lunar surface vehicles**
- . roving vehicles
- . . lunar roving vehicles
- . . . **manned lunar surface vehicles**
- RT crawler tractors
- lunar logistics
- lunar mobile laboratories
- $\infty$  surfaces
- $\infty$  vehicles
- walking machines

### manned maneuvering units

- SN (LIMITED TO ASTRONAUT PROPULSIVE UNITS OF THAT NAME DESIGNED FOR THE SPACE TRANSPORTATION SYSTEM AND THE SPACE STATION)
- DEF A propulsive backpack device for extravehicular activity. It uses a low thrust, dry, cold nitrogen propellant.
- GS astronaut maneuvering equipment
- . **manned maneuvering units**

- RT astronaut locomotion
- extravehicular activity
- life support systems
- orbital servicing
- self maneuvering units
- space transportation system

### manned Mars missions

DEF Any of several options for manned missions to Mars in which spacecraft are built for a particular mission. A mission is estimated by around 2020 and may last from one year to three years depending on speed and design.

- GS space missions
- . Mars missions
- . . **manned Mars missions**

- RT Crew Exploration Vehicle
- in situ resource utilization
- interplanetary flight
- interplanetary spacecraft
- long duration space flight
- magnetic sails
- manned spacecraft
- Mars (planet)
- Mars exploration
- NASA space programs
- return to Earth space flight
- space exploration
- terraforming

### manned orbital laboratories

- UF *MOL (orbital laboratories)*
- MORL*

- GS laboratories

- . space laboratories
- . . **manned orbital laboratories**
- . . . Columbus module
- . . . Destiny Laboratory Module
- . . . Kibo Japanese Experiment Module
- . . . Skylab 1
- . . . Skylab 2
- . . . Skylab 3
- . . . Skylab 4
- . . . Spacelab
- manned spacecraft
- . **manned orbital laboratories**
- . . Columbus module
- . . Destiny Laboratory Module
- . . Kibo Japanese Experiment Module
- . . Skylab 1
- . . Skylab 2
- . . Skylab 3
- . . Skylab 4
- . . Spacelab
- RT Apollo spacecraft
- Columbus space station
- International Space Station
- orbital workshops
- reconnaissance spacecraft
- space stations
- $\infty$  spacecraft
- Titan 3 launch vehicle

### manned orbital space stations

USE **space stations**

### manned orbital telescopes

- UF *MOT (orbital telescopes)*
- GS telescopes
- . **manned orbital telescopes**
- . . Apollo telescope mount
- RT OAO

### manned reentry

- GS atmospheric entry
- . reentry
- . . **manned reentry**
- space flight
- . manned space flight
- . . **manned reentry**
- RT descent trajectories
- environmental control
- lifting reentry vehicles
- reentry communication
- spacecraft reentry

### manned space flight

- GS space flight
- . **manned space flight**

- .. Apollo flights
- ... Apollo 5 flight
- ... Apollo 6 flight
- ... Apollo 7 flight
- ... Apollo 8 flight
- ... Apollo 9 flight
- ... Apollo 10 flight
- ... Apollo 11 flight
- ... Apollo 12 flight
- ... Apollo 13 flight
- ... Apollo 14 flight
- ... Apollo 15 flight
- ... Apollo 16 flight
- ... Apollo 17 flight
- .. Gemini flights
- ... Gemini 3 flight
- ... Gemini 4 flight
- ... Gemini 5 flight
- ... Gemini 6 flight
- ... Gemini 7 flight
- ... Gemini 8 flight
- ... Gemini 9 flight
- ... Gemini 10 flight
- ... Gemini 11 flight
- ... Gemini 12 flight
- .. manned reentry
- .. Mercury flights
- ... Mercury MA-1 flight
- ... Mercury MA-2 flight
- ... Mercury MA-3 flight
- ... Mercury MA-4 flight
- ... Mercury MA-5 flight
- ... Mercury MA-6 flight
- ... Mercury MA-7 flight
- ... Mercury MA-8 flight
- ... Mercury MA-9 flight
- ... Mercury MR-1 flight
- ... Mercury MR-2 flight
- ... Mercury MR-3 flight
- ... Mercury MR-4 flight
- .. Space Shuttle missions
- ... Space Shuttle mission 31-A
- ... Space Shuttle mission 31-B
- ... Space Shuttle mission 31-C
- ... Space Shuttle mission 31-D
- ... Space Shuttle mission 41-A
- ... Space Shuttle mission 41-B
- ... Space Shuttle mission 41-C
- ... Space Shuttle mission 41-D
- ... Space Shuttle mission 41-G
- ... Space Shuttle mission 51-A
- ... Space Shuttle mission 51-B
- ... Space Shuttle mission 51-C
- ... Space Shuttle mission 51-D
- ... Space Shuttle mission 51-E
- ... Space Shuttle mission 51-F
- ... Space Shuttle mission 51-G
- ... Space Shuttle mission 51-H
- ... Space Shuttle mission 51-I
- ... Space Shuttle mission 51-J
- ... Space Shuttle mission 51-L
- ... Space Shuttle mission 61-A
- ... Space Shuttle mission 61-B
- ... Space Shuttle mission 61-C
- ... Space Shuttle mission 61-E
- RT aerospace environments
- Apollo extension system
- Atlantis (orbiter)
- Columbia (Orbiter)
- Constellation program
- Crew Exploration Vehicle
- Discovery (Orbiter)
- Enterprise (Orbiter)
- extravehicular activity
- Gemini 2 spacecraft
- Gemini (GT-1) spacecraft
- Gemini B spacecraft
- Gemini spacecraft
- human factors engineering
- Indian space program
- interplanetary flight
- interstellar travel
- intravehicular activity
- long duration space flight
- man operated propulsion systems
- Mercury project
- space adaptation syndrome
- space communication
- space exploration
- space flight stress
- space logistics
- space programs
- space psychology
- Space Shuttle orbiters
- space shuttles
- spacecrew transfer
- suborbital flight
- manned space flight network**
- GS networks
- .. tracking networks
- ... **manned space flight network**
- RT Advanced Range Instrumentation Ship
- unified S band
- manned spacecraft**
- GS **manned spacecraft**
- .. Apollo spacecraft
- .. Apollo lunar experiment module
- .. Astro vehicle
- .. Columbus space station
- .. ferry spacecraft
- .. Gemini B spacecraft
- .. Gemini spacecraft
- .. Gemini 2 spacecraft
- .. Gemini (GT-1) spacecraft
- .. Janus spacecraft
- .. Lunar Module
- .. Apollo lunar experiment module
- .. LSSM
- .. Lunar Module 5
- .. Lunar Module 7
- .. man tended free flyers
- .. manned orbital laboratories
- .. Columbus module
- .. Destiny Laboratory Module
- .. Kibo Japanese Experiment Module
- .. Skylab 1
- .. Skylab 2
- .. Skylab 3
- .. Skylab 4
- .. Spacelab
- .. MARS (Manned Reusable Spacecraft)
- .. Mercury spacecraft
- .. Aurora 7
- .. Faith 7
- .. Friendship 7
- .. SIGMA 7
- .. Mir space station
- .. orbital workshops
- .. Saturn workshops
- ... Saturn 1 workshop
- ... Saturn 5 workshop
- .. Skylab 1
- .. Skylab 2
- .. Skylab 3
- .. Skylab 4
- .. Salyut space station
- .. Soyuz spacecraft
- .. Space Operations Center (NASA)
- .. space shuttles
- .. Buran space shuttle
- .. Hermes manned spaceplane
- .. Space Shuttle orbiters
- ... Atlantis (orbiter)
- ... Challenger (Orbiter)
- ... Columbia (Orbiter)
- ... Discovery (Orbiter)
- ... Endeavour (orbiter)
- ... Enterprise (Orbiter)
- .. voskhod manned spacecraft
- .. Voskhod 1 spacecraft
- .. Voskhod 2 spacecraft
- .. Vostok spacecraft
- .. Vostok 1 spacecraft
- .. Vostok 2 spacecraft
- .. Vostok 3 spacecraft
- .. Vostok 4 spacecraft
- .. Vostok 5 spacecraft
- .. Vostok 6 spacecraft
- .. Altair Lunar Lander
- .. Crew Exploration Vehicle
- .. HOPE aerospace plane
- .. Shenzhou 5 spacecraft
- RT Apollo 7 flight
- Apollo 8 flight
- Apollo 10 flight
- Apollo 11 flight
- Apollo 12 flight
- Apollo 13 flight
- Apollo 14 flight
- Apollo 15 flight
- Apollo 16 flight
- Apollo 17 flight
- Apollo project
- Apollo Soyuz test project
- approach and landing tests (STS)
- artificial satellites
- biosatellites
- boostglide vehicles
- command service modules
- environmental control
- gravity gradient satellites
- interplanetary spacecraft
- landing modules
- lifting reentry vehicles
- lunar landing modules
- lunar satellites
- lunar spacecraft
- maneuverable spacecraft
- manned Mars missions
- Mercury flights
- Mercury project
- military spacecraft
- reconnaissance spacecraft
- recoverable spacecraft
- rendezvous spacecraft
- reusable spacecraft
- Shuttle Derived Vehicles
- space capsules
- space navigation
- Space Shuttle Boosters
- space stations
- ∞ spacecraft
- spacecraft cabin simulators
- unmanned spacecraft
- X-20 aircraft
- Manning theory**
- RT fluid flow
- ∞ theories
- wall flow
- mannitol**
- GS organic compounds
- .. carbohydrates
- .. sugars
- ... **mannitol**
- Mann-Whitney-Wilcoxon U test**
- GS statistical analysis
- .. statistical tests
- .. **Mann-Whitney-Wilcoxon U test**
- RT quality control
- manometers**
- DEF Instruments for measuring pressure of gases and vapors above and below atmospheric pressure. Used for micromanometers and U tubes.
- UF *micromanometers*
- U tubes*
- GS measuring instruments
- .. pressure gages
- .. **manometers**
- RT barometers
- blood pressure
- flame probes
- pressure distribution
- pressure measurement
- vacuum gages
- manpower**
- GS **manpower**
- .. engineers
- .. scientists
- RT engineering management
- human resources
- labor
- personnel
- research management
- resources

retraining

*mantle (Earth structure)*

USE **Earth mantle**

∞ **manual**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT manual control  
manuals

**manual control**

GS **manual control**  
. visual control  
RT aircraft control  
attitude control  
automatic control  
∞ buttons  
consoles  
∞ control  
control boards  
control equipment  
control sticks  
directional control  
engine control  
guidance (motion)  
handles  
helicopter control  
human factors engineering  
knobs  
landing instruments  
lateral control  
levers  
longitudinal control  
∞ manual  
pedals  
reentry guidance  
remote control  
satellite control  
satellite guidance  
servocontrol  
spacecraft control  
spacecraft guidance  
speed control  
temperature control

**manuals**

GS documents  
. **manuals**  
. . installation manuals  
. . user manuals (computer programs)  
RT directories  
educational resources  
handbooks  
maintenance  
∞ manual  
textbooks

**manufacturing**

GS **manufacturing**  
. computer aided manufacturing  
. group technology (manufacturing)  
. low gravity manufacturing  
. space manufacturing  
RT aircraft production costs  
commerce  
commodities  
containerless melts  
contract negotiation  
economic development  
fabrication  
industries  
Kraft process (woodpulp)  
∞ processing  
production management  
products  
space industrialization  
technologies  
technology assessment  
technology utilization

**manures**

DEF Materials that fertilize land. Refuse of stables and barnyards consisting of mammal and bird excreta with or without litter.  
GS wastes  
. **manures**  
RT biomass energy production  
metabolic wastes  
waste disposal

waste utilization

**many body problem**

UF *many particle theory*  
*N-body problem*  
RT BCS theory  
celestial mechanics  
density functional theory  
elementary excitations  
field theory (physics)  
four body problem  
Green's functions  
Hartree approximation  
orbital mechanics  
orbits  
particle theory  
perturbation  
perturbation theory  
∞ problems  
∞ quantum statistics  
statistical mechanics  
superfluidity  
three body problem  
Trojan orbits  
two body problem

**many electron effects**

RT autoionization  
electron capture  
electron scattering  
electron states  
electron transitions

*many particle theory*

USE **many body problem**

**MAP (programming language)**

GS languages  
. programming languages  
. . Assembly language  
. . . **MAP (programming language)**  
RT computer programming

*MAP (space probe)*

(added November 2002)

USE **Microwave Anisotropy Probe**

**map matching guidance**

GS guidance (motion)  
. **map matching guidance**  
RT airborne equipment  
display devices  
image correlators  
radar maps  
radar navigation  
TERCOM  
terrain following  
video landmark acquisition and tracking

**mapping**

SN (EXCLUDES CONFORMAL MAPPING)  
UF *cartography*  
*flux mapping*  
GS **mapping**  
. cadastral mapping  
. computer aided mapping  
. ice mapping  
. photomapping  
. planetary mapping  
. soil mapping  
. thematic mapping  
. thermal mapping  
RT astrography  
Bonne projection  
contours  
declination  
fixed points (mathematics)  
functions (mathematics)  
geographic applications program  
geography  
Heat Capacity Mapping Mission  
hypsography  
maps  
Mapsat  
orthophotography  
Phoenix quadrangle (AZ)  
photogrammetry  
photography  
scale (ratio)

SPOT (French satellite)  
surveys  
terrain analysis  
topography  
topology  
triangulation

**maps**

GS **maps**  
. astronomical maps  
. . planispheres  
. lunar maps  
. meteorological charts  
. photomaps  
. radar clutter maps  
. radar maps  
. relief maps  
RT Bonne projection  
cadastral mapping  
charts  
computer aided mapping  
coordinates  
datum (elevation)  
geography  
∞ globes  
hypsography  
mapping  
Mercator projection  
navigation aids  
photomapping  
soil mapping  
surveys  
thematic mapping

**Mapsat**

DEF A proposed stereoscopic system for mapping the Earth from space to replace Landsat D as defined by the US Geological Survey.  
GS artificial satellites  
. **Mapsat**  
RT Landsat satellites  
mapping  
remote sensing  
stereophotography

**maraging**

GS hardening (materials)  
. precipitation hardening  
. . **maraging**  
heat treatment  
. **maraging**

**maraging steels**

GS alloys  
. high strength alloys  
. . high strength steels  
. . . **maraging steels**  
. iron alloys  
. . steels  
. . . high strength steels  
. . . . **maraging steels**  
RT martensitic stainless steels  
stainless steels

**Marangoni convection**

DEF Convective flow induced by surface tension gradients. This is important in both ground and space processing where a free surface is present.  
GS convection  
. surface tension driven convection  
. . **Marangoni convection**  
RT convective flow  
free convection  
interfacial tension  
liquid bridges  
low gravity manufacturing  
melts (crystal growth)  
microgravity  
space processing  
thermocapillary migration

*Marbore 2 engine*

USE **J-69-T-25 engine**

**Marecs maritime satellites**

DEF The European Space Agency's system of two satellites provides maritime communications links between ships and coast Earth stations. Originally known as Marots, the system

operates with one satellite over the Atlantic Ocean and one over the Pacific Ocean. It was leased to the International Maritime Satellite Organization for five years. Also known as the maritime European communications satellite.

- GS artificial satellites
  - . communication satellites
  - . . . **Marecs maritime satellites**
  - . ESA satellites
  - . . . **Marecs maritime satellites**
  - . maritime satellites
  - . . **Marecs maritime satellites**
  - ESA spacecraft
  - . ESA satellites
  - . . **Marecs maritime satellites**
- RT European space programs satellite networks

**margins**

- RT borders
- edges
- rims

**maria**

- GS **maria**
  - . lunar maria
- RT lava
- meteorite craters
- topography

**marijuana**

- GS drugs
  - . psychotropic drugs
  - . . . **marijuana**
- RT alkaloids

**marine biology**

- DEF The study of marine fauna and flora and related topics.
- RT algae
  - aquatic plants
  - aquaculture
  - ∞ biology
    - environment effects
    - environmental quality
    - fisheries
    - limnology
    - oceanography
    - phytoplankton
  - ∞ science
    - sea grasses
    - seals (animals)
    - seaweeds
    - shellfish
    - thermal pollution
    - waterfowl
    - wetlands
    - zooplankton

**marine chemistry**

- DEF The study of the chemical processes in oceanic environments.
- GS environmental chemistry
  - . **marine chemistry**
- RT biochemistry
- ∞ chemistry
  - geochemistry
  - hydrology
  - limnology
  - ocean bottom
- ∞ science
  - sediments

**marine environments**

- GS environments
  - . **marine environments**
- RT aquaculture
  - beaches
  - coastal ecology
  - coasts
  - environment effects
  - ice environments
  - nearshore water
  - ocean models
  - oceanography
  - red tide
  - sea breeze
  - shellfish
  - waterfowl

wetlands

**marine mammals**

- GS animals
  - . vertebrates
  - . . . mammals
  - . . . **marine mammals**
  - . . . . dolphins
  - . . . . manatees
  - . . . . porpoises
  - . . . . seals (animals)
  - . . . . whales

**marine meteorology**

- GS meteorology
  - . hydrometeorology
  - . . **marine meteorology**
- RT fronts (meteorology)
- GOES 13
- oceanography
- ∞ science
  - typhoons
  - wind (meteorology)

*marine navigation*

- USE **surface navigation**

**marine propulsion**

- GS propulsion
  - . **marine propulsion**
  - . . underwater propulsion
  - . . . submarine propulsion
- RT chemical propulsion
  - electric propulsion
  - jet propulsion
  - nuclear electric propulsion
  - nuclear propulsion
  - propeller drive
  - Savannah nuclear ship

**marine resources**

- GS resources
  - . Earth resources
  - . . **marine resources**
- RT aquaculture
  - coastal ecology
  - fisheries
  - oceanography
  - oceans
  - sea water
  - shellfish
  - underwater resources
  - water pollution
  - wetlands

**marine rudders**

- GS control surfaces
  - . rudders
  - . . **marine rudders**
- RT aerial rudders
  - hydrofoils
  - tail assemblies

**marine technology**

- GS technologies
  - . **marine technology**
- RT aquaculture
  - artificial harbors
  - deepwater terminals
  - oceanography
  - offshore docking
  - offshore energy sources
  - offshore platforms
  - tanker terminals
  - wharves

**marine transportation**

- GS transportation
  - . **marine transportation**
- RT air transportation
  - deepwater terminals
  - harbors
  - offshore docking
  - rail transportation
  - ships
  - tanker ships
  - water vehicles

**Mariner 1 space probe**

- GS interplanetary spacecraft

- . Mariner space probes
- . . **Mariner 1 space probe**
- . Venus probes
- . . **Mariner 1 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner 1 space probe**
- . . Venus probes
- . . . **Mariner 1 space probe**

**Mariner 2 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 2 space probe**
  - . Venus probes
  - . . **Mariner 2 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 2 space probe**
  - . . Venus probes
  - . . . **Mariner 2 space probe**
- RT Atlas Agena B launch vehicle

**Mariner 3 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 3 space probe**
  - . Mars probes
  - . . **Mariner 3 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 3 space probe**
  - . . Mars probes
  - . . . **Mariner 3 space probe**

**Mariner 4 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 4 space probe**
  - . Mars probes
  - . . **Mariner 4 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 4 space probe**
  - . . Mars probes
  - . . . **Mariner 4 space probe**

**Mariner 5 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 5 space probe**
  - . Venus probes
  - . . **Mariner 5 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 5 space probe**
  - . . Venus probes
  - . . . **Mariner 5 space probe**
- RT Atlas Agena launch vehicles

**Mariner 6 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 6 space probe**
  - . Mars probes
  - . . **Mariner 6 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 6 space probe**
  - . . Mars probes
  - . . . **Mariner 6 space probe**
- RT Atlas Agena launch vehicles
- Mars 69 project

**Mariner 7 space probe**

- GS interplanetary spacecraft
  - . Mariner space probes
  - . . **Mariner 7 space probe**
  - . Mars probes
  - . . **Mariner 7 space probe**
  - unmanned spacecraft
  - . space probes
  - . . Mariner space probes
  - . . . **Mariner 7 space probe**

## Mariner 8 space probe

- . . Mars probes
- . . . **Mariner 7 space probe**
- RT Mars 69 project

**Mariner 8 space probe**

- GS interplanetary spacecraft
- . Mariner space probes
- . . **Mariner 8 space probe**
- . Mars probes
- . . **Mariner 8 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner 8 space probe**
- . Mars probes
- . . **Mariner 8 space probe**
- RT Mars 71 project

**Mariner 9 space probe**

- GS interplanetary spacecraft
- . Mariner space probes
- . . **Mariner 9 space probe**
- . Mars probes
- . . **Mariner 9 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner 9 space probe**
- . Mars probes
- . . **Mariner 9 space probe**

**Mariner 10 space probe**

- GS interplanetary spacecraft
- . Mariner space probes
- . . **Mariner 10 space probe**
- . Venus probes
- . . **Mariner 10 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner 10 space probe**
- . Venus probes
- . . . **Mariner 10 space probe**
- RT Mariner Venus-Mercury 1973
- Mariner-Mercury 1973

**Mariner 11 space probe**

- GS interplanetary spacecraft
- . Mariner space probes
- . . **Mariner 11 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner 11 space probe**

**Mariner C spacecraft**

- GS interplanetary spacecraft
- . Mariner spacecraft
- . . **Mariner C spacecraft**
- unmanned spacecraft
- . space probes
- . . Mariner spacecraft
- . . . **Mariner C spacecraft**

**Mariner Jupiter-Saturn flyby**

- GS space missions
- . flyby missions
- . . Grand Tours
- . . . **Mariner Jupiter-Saturn flyby**
- RT interplanetary flight
- ∞ missions
- space flight

**Mariner Jupiter-Uranus flyby**

- GS space missions
- . flyby missions
- . . Grand Tours
- . . . **Mariner Jupiter-Uranus flyby**
- RT interplanetary flight
- ∞ missions
- space flight

**Mariner Mark 2 Spacecraft**

- DEF A NASA concept of a basic planetary spacecraft for studying the outer planets, comets, and asteroids. The first of the series will be a comet rendezvous mission to be launched in 1994.
- RT Cassini mission

- Comet Rendezvous Asteroid Flyby Mission
- flyby missions
- interplanetary flight
- ∞ spacecraft

**Mariner program**

- GS programs
- . NASA programs
- . . NASA space programs
- . . . **Mariner program**
- . . . . Mariner Venus-Mercury 1973
- . . . . Mariner-Mercury 1973
- . space programs
- . . NASA space programs
- . . . **Mariner program**
- . . . . Mariner Venus-Mercury 1973
- . . . . Mariner-Mercury 1973

RT Agena B rocket vehicle

- Agena rocket vehicles
- Atlas Agena launch vehicles
- Atlas launch vehicles
- Centaur project
- flyby missions
- Mars probes
- space probes
- unmanned spacecraft
- Venus probes

**Mariner R 2 space probe**

- GS interplanetary spacecraft
- . Mariner space probes
- . . **Mariner R 2 space probe**
- unmanned spacecraft
- . space probes
- . . Mariner space probes
- . . . **Mariner R 2 space probe**

**Mariner space probes**

- GS interplanetary spacecraft
- . **Mariner space probes**
- . . Mariner 1 space probe
- . . Mariner 2 space probe
- . . Mariner 3 space probe
- . . Mariner 4 space probe
- . . Mariner 5 space probe
- . . Mariner 6 space probe
- . . Mariner 7 space probe
- . . Mariner 8 space probe
- . . Mariner 9 space probe
- . . Mariner 10 space probe
- . . Mariner 11 space probe
- . . Mariner R 2 space probe
- unmanned spacecraft
- . space probes
- . . **Mariner space probes**
- . . . Mariner 1 space probe
- . . . Mariner 2 space probe
- . . . Mariner 3 space probe
- . . . Mariner 4 space probe
- . . . Mariner 5 space probe
- . . . Mariner 6 space probe
- . . . Mariner 7 space probe
- . . . Mariner 8 space probe
- . . . Mariner 9 space probe
- . . . Mariner 10 space probe
- . . . Mariner 11 space probe
- . . . Mariner R 2 space probe

**Mariner spacecraft**

- GS interplanetary spacecraft
- . **Mariner spacecraft**
- . . Mariner C spacecraft
- . . Mariner Venus 67 spacecraft
- unmanned spacecraft
- . space probes
- . . **Mariner spacecraft**
- . . . Mariner C spacecraft
- . . . Mariner Venus 67 spacecraft

**Mariner Venus 67 spacecraft**

- GS interplanetary spacecraft
- . Mariner spacecraft
- . . **Mariner Venus 67 spacecraft**
- unmanned spacecraft
- . space probes
- . . Mariner spacecraft
- . . . **Mariner Venus 67 spacecraft**

- RT Venus probes

**Mariner Venus-Mercury 1973**

- GS programs
- . NASA programs
- . . NASA space programs
- . . . Mariner program
- . . . . **Mariner Venus-Mercury 1973**
- . space programs
- . . NASA space programs
- . . . Mariner program
- . . . . **Mariner Venus-Mercury 1973**
- space missions
- . flyby missions
- . . **Mariner Venus-Mercury 1973**
- RT Mariner 10 space probe
- Mariner-Mercury 1973

**Mariner-Mercury 1973**

- GS programs
- . NASA programs
- . . NASA space programs
- . . . Mariner program
- . . . . **Mariner-Mercury 1973**
- . space programs
- . . NASA space programs
- . . . Mariner program
- . . . . **Mariner-Mercury 1973**
- space missions
- . flyby missions
- . . **Mariner-Mercury 1973**
- RT Mariner 10 space probe
- Mariner Venus-Mercury 1973

**Marisat 1 satellite**

- DEF The first commercial maritime communication satellite.
- GS artificial satellites
- . Marisat satellites
- . . **Marisat 1 satellite**
- RT radio communication

**Marisat satellites**

- DEF A class of maritime commercial communication service satellites designed to provide telephone, telegraph, radio, distress messages and facsimile services to merchant ships, etc.
- GS artificial satellites
- . **Marisat satellites**
- . . Marisat 1 satellite
- RT communication
- Fleet Satellite Communication System
- INMARSAT satellites
- Marots (ESA)
- radio communication

*Maritime Communication Satellite (ESA)*

- USE **Marots (ESA)**

*Maritime Orbital Test Satellite*

- USE **Marots (ESA)**

**maritime satellites**

- GS artificial satellites
- . **maritime satellites**
- . . ERS-1 (ESA satellite)
- . . Marecs maritime satellites
- . . Marots (ESA)
- RT MSAT
- National Oceanic Satellite System
- TOPEX

**Mark 1 reentry body**

- GS reentry vehicles
- . **Mark 1 reentry body**
- RT intercontinental ballistic missiles
- intermediate range ballistic missiles

**Mark 1 spacecraft**

- RT ∞ spacecraft

**Mark 2 reentry body**

- GS reentry vehicles
- . **Mark 2 reentry body**
- RT intercontinental ballistic missiles
- intermediate range ballistic missiles

**Mark 3 reentry body**

- GS reentry vehicles
- . **Mark 3 reentry body**

- RT intercontinental ballistic missiles  
intermediate range ballistic missiles
- Mark 4 reentry body**
  - GS reentry vehicles
  - . **Mark 4 reentry body**
  - RT intercontinental ballistic missiles
- Mark 5 reentry body**
  - GS reentry vehicles
  - . **Mark 5 reentry body**
  - RT intercontinental ballistic missiles
- Mark 6 reentry body**
  - GS reentry vehicles
  - . **Mark 6 reentry body**
  - RT intercontinental ballistic missiles
- Mark 11 reentry body**
  - GS reentry vehicles
  - . **Mark 11 reentry body**
  - RT intercontinental ballistic missiles
- Mark 12 reentry body**
  - GS reentry vehicles
  - . **Mark 12 reentry body**
  - RT intercontinental ballistic missiles
- Mark 17 reentry body**
  - GS reentry vehicles
  - . **Mark 17 reentry body**
  - RT intercontinental ballistic missiles
- Markarian galaxies**
  - GS celestial bodies
  - . galaxies
  - . . active galaxies
  - . . . **Markarian galaxies**
  - RT Seyfert galaxies
- ∞ **markers**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT beacons
  - biomarkers
  - buoys
  - crayons
  - dyes
  - radio beacons
  - runway lights
  - smoke
- market research**
  - GS research
  - . **market research**
  - RT commerce
  - commodities
  - consumers
  - marketing
  - product development
- marketing**
  - RT commerce
  - commercialization
  - consumers
  - finance
  - industrial areas
  - management
  - market research
  - product development
  - supplying
- marking**
  - UF *labeling (marking)*
  - tagging*
  - GS **marking**
  - . isotopic labeling
  - RT detection
  - identifying
  - materials handling
  - packaging
  - staining
  - ∞ tracers
- Markov chains**
  - GS stochastic processes
  - . Markov processes
  - . . **Markov chains**
  - RT Monte Carlo method
- random walk
- Markov processes**
  - GS stochastic processes
  - . **Markov processes**
  - . . Markov chains
  - RT random processes
  - zero sum games
- markup languages*  
(added June 2000)
- USE **document markup languages**
- Marots (ESA)**
  - DEF Earlier name for the Marecs maritime satellites. Used for Maritime Communication Satellite (ESA) and Maritime Orbital Test Satellite.
  - UF *Maritime Communication Satellite (ESA)*
  - Maritime Orbital Test Satellite*
  - GS artificial satellites
  - . communication satellites
  - . . **Marots (ESA)**
  - . ESA satellites
  - . . **Marots (ESA)**
  - . maritime satellites
  - . . **Marots (ESA)**
  - ESA spacecraft
  - . ESA satellites
  - . . **Marots (ESA)**
  - RT European Space Agency
  - Marisat satellites
  - rangefinding
  - rescue operations
  - ship terminals
- Marquardt R4D engine**
  - GS engines
  - . **Marquardt R4D engine**
  - RT Apollo project
  - auxiliary propulsion
  - command modules
  - ∞ reaction control
  - satellite attitude control
  - spacecraft control
- ∞ **mars**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT MARS (Manned Reusable Spacecraft)
  - Mars (planet)
  - navigation aids
  - tracking stations
- Mars 1 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 1 spacecraft**
  - Soviet spacecraft
  - . **Mars 1 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 1 spacecraft**
  - RT U.S.S.R. space program
- Mars 2 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 2 spacecraft**
  - Soviet spacecraft
  - . **Mars 2 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 2 spacecraft**
  - RT U.S.S.R. space program
- Mars 3 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 3 spacecraft**
  - Soviet spacecraft
  - . **Mars 3 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 3 spacecraft**
- Mars 4 Spacecraft**
  - DEF One of a series of Soviet unmanned spacecraft designed for Mars exploration.
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 4 Spacecraft**
  - Soviet spacecraft
  - . **Mars 4 Spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 4 Spacecraft**
  - RT U.S.S.R. space program
- Mars 5 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 5 spacecraft**
  - Soviet spacecraft
  - . **Mars 5 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 5 spacecraft**
  - RT U.S.S.R. space program
- Mars 6 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 6 spacecraft**
  - Soviet spacecraft
  - . **Mars 6 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 6 spacecraft**
  - RT U.S.S.R. space program
- Mars 7 spacecraft**
  - GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars 7 spacecraft**
  - Soviet spacecraft
  - . **Mars 7 spacecraft**
  - unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Mars 7 spacecraft**
  - RT U.S.S.R. space program
- Mars 69 project**
  - GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . **Mars 69 project**
  - . projects
  - . . **Mars 69 project**
  - . space programs
  - . . NASA space programs
  - . . . **Mars 69 project**
  - RT Mariner 6 space probe
  - Mariner 7 space probe
  - space exploration
- Mars 71 project**
  - GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . **Mars 71 project**
  - . projects
  - . . **Mars 71 project**
  - . space programs
  - . . NASA space programs
  - . . . **Mars 71 project**
  - RT Mariner 8 space probe
  - space exploration
- MARS (Manned Reusable Spacecraft)**
  - SN (NOT RESTRICTED TO SPACECRAFT FOR FLIGHT TO PLANET MARS)
  - UF *Manned Aerodynamic Reusable Spaceship*
  - GS manned spacecraft
  - . **MARS (Manned Reusable Spacecraft)**
  - reentry vehicles
  - . recoverable spacecraft
  - . . reusable spacecraft



## Mars (planet)

- . . . **MARS (Manned Reusable Spacecraft)**
- RT ferry spacecraft
- maneuverable spacecraft
- ∞ mars
- Mars (planet)**
- GS celestial bodies
  - . planets
  - . . terrestrial planets
  - . . . **Mars (planet)**
- RT 2001 Mars Odyssey
- Amor asteroid
- Apollo asteroids
- Deimos
- dust storms
- extraterrestrial water
- manned Mars missions
- ∞ mars
- Mars atmosphere
- Mars bases
- Mars environment
- Mars Reconnaissance Orbiter
- Mars sample return missions
- Mars surface
- Mars volcanoes
- Phobos
- planetary craters
- planetary cryospheres
- polar caps
- SNC meteorites
- terraforming
- Mars atmosphere**
- GS environments
  - . extraterrestrial environments
  - . . planetary environments
  - . . . Mars environment
  - . . . . **Mars atmosphere**
  - . . . . planetary atmospheres
  - . . . . . **Mars atmosphere**
- RT aerospace environments
- Mars (planet)
- Mars Climate Orbiter
- Mars Express
- Mars Global Surveyor
- Mars Polar Lander
- Mars Surveyor 98 Program
- Mars volcanoes
- Phobos spacecraft
- planetary ionospheres
- planetary meteorology
- Mars bases**
- (added September 1994)
- UF *Mars colonies*
- GS space bases
  - . planetary bases
  - . . **Mars bases**
- RT extraterrestrial environments
- long duration space flight
- lunar bases
- Mars (planet)
- space colonies
- space habitats
- Mars Climate Orbiter**
- (added March 1999)
- DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched December 1998. After obtaining a polar, nearly circular orbit around Mars, the Orbiter will serve as a radio relay during the Lander surface mission, then begin monitoring the atmosphere, surface, and polar caps for a complete Martian year. The Orbiter carries two science instruments: the Pressure Modulated Infrared Radiometer and the Mars Color Imager.
- UF *Mars Surveyor 98 Orbiter*
- GS interplanetary spacecraft
  - . Mars probes
  - . . **Mars Climate Orbiter**
  - . . . unmanned spacecraft
  - . . . . space probes
  - . . . . . Mars probes
  - . . . . . **Mars Climate Orbiter**
- RT Mars atmosphere
- Mars missions
- Mars Polar Lander
- Mars surface

Mars Surveyor 98 Program

*Mars colonies*  
USE **Mars bases**

**Mars craters**

DEF Craters from meteoritic impact on the surface of Mars.

GS craters

- . planetary craters
- . . **Mars craters**

RT cratering

ejecta

impact damage

meteorite craters

meteoritic damage

**Mars environment**

GS environments

- . extraterrestrial environments
- . . planetary environments
- . . . **Mars environment**
- . . . . Mars atmosphere

RT dust storms

Mars (planet)

Mars Surveyor 2001 Mission

Mars volcanoes

Phobos spacecraft

terraforming

**Mars Excursion Module**

UF *MEM (excursion module)*

GS modules

- . spacecraft modules
- . . landing modules
- . . . **Mars Excursion Module**
- . . . . soft landing spacecraft
- . . . . . landing modules
- . . . . . **Mars Excursion Module**
- . . . . . spacecraft components
- . . . . . . spacecraft modules
- . . . . . . . landing modules
- . . . . . . . **Mars Excursion Module**

RT Mars exploration

**Mars exploration**

(added September 1994)

GS exploration

- . space exploration
- . . **Mars exploration**

RT 2001 Mars Odyssey

Crew Exploration Vehicle

Earth-Mars trajectories

interplanetary flight

lunar exploration

manned Mars missions

Mars Excursion Module

Mars Express

Mars landing sites

Mars missions

Mars Reconnaissance Orbiter

Mars roving vehicles

Marsokhod Mars roving vehicles

space colonies

**Mars Express**

(added November 2003)

DEF European Space Agency spacecraft and related mission designed to search for sub-surface water on Mars and collect data on the Mars atmosphere, structure, geology, and composition. The spacecraft will deploy a lander ( Beagle 2 ) that will perform exobiology and geochemistry research. Launched June 2003.

GS interplanetary spacecraft

- . Mars probes
- . . **Mars Express**
- . . . unmanned spacecraft
- . . . . space probes
- . . . . . Mars probes
- . . . . . **Mars Express**

RT European Space Agency

European space programs

Mars atmosphere

Mars exploration

Mars landing

Mars missions

Mars surface

planetary geology

*Mars Geoscience Climatology Orbiter*  
USE **Mars Observer**

**Mars Global Surveyor**

(added March 1999)

DEF Spacecraft and related mission designed to orbit Mars over a two year period and collect data on the surface morphology, topography, composition, gravity, atmospheric dynamics, and magnetic field. Launched November 1996.

UF *Mars Orbiter Camera (MOC)*

*Mars Orbiter Laser Altimeter (MOLA)*

*MGS (spacecraft)*

GS interplanetary spacecraft

- . Mars probes
- . . **Mars Global Surveyor**
- . . . unmanned spacecraft
- . . . . space probes
- . . . . . Mars probes
- . . . . . **Mars Global Surveyor**

RT Mars atmosphere

Mars missions

Mars Observer

Mars surface

**Mars landing**

GS landing

- . spacecraft landing
- . . planetary landing
- . . . **Mars landing**

RT AEPS

Mars Express

Mars landing sites

Mars missions

Mars Pathfinder

Mars sample return missions

soft landing

Viking 1975 entry vehicle

**Mars landing sites**

(added February 2001)

DEF Areas on the Martian surface selected for spacecraft landing, or areas where spacecraft have actually landed.

GS sites

- . landing sites
- . . **Mars landing sites**

RT Mars exploration

Mars landing

Mars missions

Mars surface

site selection

**Mars missions**

(added February 1999)

GS space missions

- . **Mars missions**
- . . 2001 Mars Odyssey
- . . . manned Mars missions
- . . . . Mars sample return missions
- . . . . . Mars Surveyor 2001 Mission

RT Earth-Mars trajectories

Mars Climate Orbiter

Mars exploration

Mars Express

Mars Global Surveyor

Mars landing

Mars landing sites

Mars Observer

Mars Pathfinder

Mars Polar Lander

Mars probes

Mars Reconnaissance Orbiter

Mars roving vehicles

Mars surface samples

Mars Surveyor 98 Program

∞ missions

Phoenix Mars Lander

return to Earth space flight

**Mars Observer**

DEF Spacecraft and related mission to study the geoscience and climate of Mars. Launched September 1992. Contact with the spacecraft was lost in August 1993, three days before the scheduled Mars orbit insertion.

UF *Mars Geoscience Climatology Orbiter*

- MGCO
  - GS interplanetary spacecraft
    - . Mars probes
    - .. **Mars Observer**
    - unmanned spacecraft
    - . space probes
    - .. Mars probes
    - .. **Mars Observer**
  - RT Mars Global Surveyor
    - Mars missions
  - Mars Orbiter Camera (MOC)*
    - (added January 2004)
    - USE **Mars Global Surveyor**
  - Mars Orbiter Laser Altimeter (MOLA)*
    - (added January 2004)
    - USE **Mars Global Surveyor**
  - Mars Pathfinder**
    - (added January 1996)
    - GS interplanetary spacecraft
      - . Mars probes
      - .. **Mars Pathfinder**
      - unmanned spacecraft
      - . space probes
      - .. Mars probes
      - .. **Mars Pathfinder**
    - RT exobiology
      - landing sites
      - Mars landing
      - Mars missions
      - parachute descent
      - planetary geology
  - Mars photographs**
    - GS photographs
      - . **Mars photographs**
    - RT photography
      - satellite-borne photography
      - spaceborne photography
  - Mars Polar Lander**
    - (added March 1999)
    - DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched January 1999. After a soft landing near the Martian south pole, the Lander will search for near-surface ice and possible surface records of cyclic climate change, and characterize physical processes key to the seasonal cycles of water, carbon dioxide and dust on Mars. Prior to landing, the Deep Space 2 microprobes will be released as part of a technology-validation mission related to multiple-lander spacecraft.
    - UF *Mars Surveyor 98 Lander*
    - GS interplanetary spacecraft
      - . Mars probes
      - .. **Mars Polar Lander**
      - unmanned spacecraft
      - . space probes
      - .. Mars probes
      - .. **Mars Polar Lander**
    - RT Mars atmosphere
      - Mars Climate Orbiter
      - Mars missions
      - Mars surface
      - Mars Surveyor 98 Program
  - Mars probes**
    - GS interplanetary spacecraft
      - . **Mars probes**
      - .. Advanced Reconn Electric Spacecraft
      - .. Mariner 3 space probe
      - .. Mariner 4 space probe
      - .. Mariner 6 space probe
      - .. Mariner 7 space probe
      - .. Mariner 8 space probe
      - .. Mariner 9 space probe
      - .. Mars 1 spacecraft
      - .. Mars 2 spacecraft
      - .. Mars 3 spacecraft
      - .. Mars 4 spacecraft
      - .. Mars 5 spacecraft
      - .. Mars 6 spacecraft
      - .. Mars 7 spacecraft
      - .. Mars Observer
      - .. Mars Pathfinder
      - .. Viking 1975 entry vehicle
    - .. Viking spacecraft
      - ... Viking 1 spacecraft
        - .... Viking lander 1
        - .... Viking orbiter 1
      - ... Viking 2 spacecraft
        - .... Viking lander 2
        - .... Viking orbiter 2
      - ... Viking lander spacecraft
        - .... Viking lander 1
        - .... Viking lander 2
      - ... Viking orbiter spacecraft
        - .... Viking orbiter 1
        - .... Viking orbiter 2
        - .... Viking orbiter 1975
      - .. Mars Climate Orbiter
      - .. Mars Express
      - .. Mars Global Surveyor
      - .. Mars Polar Lander
      - .. Mars Reconnaissance Orbiter
      - .. Nozomi Mars Orbiter
      - .. Phobos spacecraft
      - .. Phoenix Mars Lander
      - .. Zond 2 space probe
    - unmanned spacecraft
      - . space probes
      - .. **Mars probes**
      - ... Advanced Reconn Electric Spacecraft
        - .... Mariner 3 space probe
        - .... Mariner 4 space probe
        - .... Mariner 6 space probe
        - .... Mariner 7 space probe
        - .... Mariner 8 space probe
        - .... Mariner 9 space probe
      - ... Mars 1 spacecraft
      - ... Mars 2 spacecraft
      - ... Mars 3 spacecraft
      - ... Mars 4 spacecraft
      - ... Mars 5 spacecraft
      - ... Mars 6 spacecraft
      - ... Mars 7 spacecraft
      - ... Mars Observer
      - ... Mars Pathfinder
      - ... Viking 1975 entry vehicle
  - RT Mariner program
    - Mars missions
    - Mars sample return missions
    - outer planets explorers
    - Venus probes
    - Voyager project
    - Zond space probes
- Mars Reconnaissance Orbiter**
  - (added August 2005)
  - DEF A spacecraft launched on August 12, 2005 to determine how long water existed on Mars by conducting surface and subsurface mapping. The Mars Reconnaissance Orbiter carries instruments for geological and meteorological observations from Martian orbit, and for spacecraft navigation and communication. After completion of its science mission, the spacecraft will provide data relay services between other Mars missions and Earth.
  - GS interplanetary spacecraft
    - . Mars probes
- .. **Mars Reconnaissance Orbiter**
  - unmanned spacecraft
  - . space probes
  - .. Mars probes
  - .. **Mars Reconnaissance Orbiter**
- RT extraterrestrial water
  - ground penetrating radar
  - interplanetary communication
  - Mars (planet)
  - Mars exploration
  - Mars missions
  - Mars surface
  - planetary mapping
  - radar geology
  - soil mapping
- Mars Rover Sample Return Mission*
  - USE **Mars sample return missions**
- Mars roving vehicles**
  - (added March 2003)
  - DEF Remote-, autonomous-, or human-controlled ground vehicles designed for the exploration of the Martian surface.
  - GS surface vehicles
    - . roving vehicles
    - .. **Mars roving vehicles**
    - ... Marsokhod Mars roving vehicles
  - RT Mars exploration
    - Mars missions
    - Mars surface
    - planetary surfaces
    - research vehicles
    - ∞ vehicles
- Mars sample return missions**
  - (added March 1989)
  - UF *Mars Rover Sample Return Mission*
  - GS space missions
    - . Mars missions
    - .. **Mars sample return missions**
    - . sample return missions
    - .. **Mars sample return missions**
  - RT Mars (planet)
    - Mars landing
    - Mars probes
    - Mars surface samples
    - NASA space programs
    - planetary protection
    - roving vehicles
    - samples
    - space exploration
- Mars satellites**
  - GS celestial bodies
    - . natural satellites
    - .. **Mars satellites**
    - ... Deimos
    - ... Phobos
- Mars surface**
  - GS planetary surfaces
    - . **Mars surface**
  - RT 2001 Mars Odyssey
    - canals
    - dust storms
    - Mars (planet)
    - Mars Climate Orbiter
    - Mars Express
    - Mars Global Surveyor
    - Mars landing sites
    - Mars Polar Lander
    - Mars Reconnaissance Orbiter
    - Mars roving vehicles
    - Mars Surveyor 98 Program
    - Mars Surveyor 2001 Mission
    - Mars volcanoes
    - meteorite craters
    - Phoenix Mars Lander
    - planetary craters
    - SNC meteorites
    - ∞ surfaces
    - terraforming
    - topography
- Mars surface samples**
  - GS samples
    - . **Mars surface samples**
  - RT assaying
    - chemical analysis

## Mars Surveyor 98 Program

Mars missions  
Mars sample return missions  
Mars Surveyor 2001 Mission  
soil sampling  
specimens  
∞ surfaces  
Viking lander 1  
Viking lander 2

*Mars Surveyor 98 Lander*  
(added March 1999)  
USE **Mars Polar Lander**

*Mars Surveyor 98 Orbiter*  
(added March 1999)  
USE **Mars Climate Orbiter**

### Mars Surveyor 98 Program

(added March 1999)

DEF Mars exploration program consisting of two mission spacecraft-- the Mars Climate Orbiter and the Mars Polar Lander. Two surface penetrating microprobes (part of the associated Deep Space 2 mission) for detecting water ice are also piggybacking on the Lander.

GS programs  
. NASA programs  
. NASA space programs  
. . . **Mars Surveyor 98 Program**  
. space programs  
. NASA space programs  
. . . **Mars Surveyor 98 Program**  
RT Mars atmosphere  
Mars Climate Orbiter  
Mars missions  
Mars Polar Lander  
Mars surface

### Mars Surveyor 2001 Mission

(added July 1999)

DEF Mars exploration mission including an orbiter with a gamma ray spectrometer and a multispectral thermal imager, and a lander with an extensive set of instrumentation, a robotic arm, and the Marie Curie Rover. (In March 2000, the lander portion of the mission was cancelled; the orbiter mission was superceded by the 2001 Mars Odyssey mission.)

GS space missions  
. Mars missions  
. . . **Mars Surveyor 2001 Mission**  
RT 2001 Mars Odyssey  
Mars environment  
Mars surface  
Mars surface samples  
NASA space programs

### Mars volcanoes

DEF Volcanoes on the planet Mars.  
GS geology  
. planetary geology  
. . . **Mars volcanoes**  
. volcanoes  
. . . **Mars volcanoes**  
landforms  
. volcanoes  
. . . **Mars volcanoes**  
RT basalt  
calderas  
cones (volcanoes)  
effusives  
lava  
Mars (planet)  
Mars atmosphere  
Mars environment  
Mars surface  
mountains  
orography  
paleomagnetism  
petrology  
Rouse belts  
volcanology

*marshes*  
USE **marshlands**

### marshlands

DEF Transitional land-water areas, covered at least part of the time by estuarine or coastal waters and characterized by aquatic and grass-

like vegetation. Used for bogs, coastal marshlands, marshes, and swamps.

UF *bogs*  
*coastal marshlands*  
*marshes*  
*swamps*  
GS land  
. wetlands  
. . . **marshlands**  
RT bayous  
Earth resources  
Earth surface  
flats (landforms)  
muskegs  
oceanography  
tidal flats  
waterfowl

### Marsokhod Mars roving vehicles

(added August 1995)

GS surface vehicles  
. roving vehicles  
. . . Mars roving vehicles  
. . . **Marsokhod Mars roving vehicles**  
RT Lunokhod lunar roving vehicles  
Mars exploration  
planetary surfaces  
∞ vehicles

### martensite

RT austenite  
hardening (materials)  
heat treatment  
iron alloys  
martensitic stainless steels  
microstructure  
phase transformations  
steels

### martensitic stainless steels

GS alloys  
. iron alloys  
. . steels  
. . . stainless steels  
. . . . **martensitic stainless steels**  
RT austenitic stainless steels  
maraging steels  
martensite

### martensitic transformation

DEF A phase transformation occurring in some metals and resulting in formation of martensite.

GS phase transformations  
. **martensitic transformation**  
RT austenite

### Martian meteorites

(added March 1998)  
USE **SNC meteorites**

### Martin aircraft

GS **Martin aircraft**  
. B-26 aircraft  
. B-57 aircraft  
RT ∞ aircraft

### martingales

DEF In game theory, a procedure for recouping one's losses in previous wagers by doubling or otherwise increasing the amount bet.

RT decision theory  
game theory  
∞ mathematics  
probability theory  
stochastic processes

### Martinique

GS landforms  
. islands  
. . West Indies  
. . . **Martinique**  
nations  
. France  
. . **Martinique**

RT Caribbean region

### Maryland

GS nations  
. United States  
. . **Maryland**  
RT Allegheny Plateau (US)  
Assateague Island (MD-VA)  
Chesapeake Bay (US)  
Delmarva Peninsula (DE-MD-VA)  
Potomac River Valley (MD-VA-WV)  
Susquehanna River Basin  
(MD-NY-PA)

### mascons

DEF Large scale, high density lunar mass concentrations below ringed mare.  
GS composition (property)  
. concentration (composition)  
. . **mascons**  
RT center of mass  
gravity anomalies  
mass  
weight (mass)

### maser materials

(added June 1989)  
RT laser materials  
masers  
∞ materials  
∞ materials science

### maser outputs

GS output  
. **maser outputs**  
RT ∞ coherence  
diffraction radiation  
laser outputs  
maser pumping  
pulse duration  
radiant flux density  
water masers  
wavelengths

### maser pumping

(added June 1989)  
RT laser pumping  
maser outputs  
masers  
optical pumping  
∞ pumping

### maser resonators

USE **masers**

### masers

DEF Amplifiers or oscillators utilizing the principle of microwave amplification by stimulated emission of radiation.

UF *maser resonators*  
*paramagnetic amplifiers*  
*rasers*  
GS stimulated emission devices  
. **masers**  
. . gas masers  
. . . hydrogen masers  
. . interstellar masers  
. . proton masers  
. . traveling wave masers  
. . water masers

RT amplifiers  
atomic clocks  
coherent electromagnetic radiation  
cross relaxation  
diffraction radiation  
frequency standards  
krypton fluoride lasers  
lasers  
maser materials  
maser pumping  
microwave amplifiers  
molecular oscillators  
resonators  
stimulated emission  
transient oscillations  
two-wavelength lasers  
ultraviolet lasers

### masking

GS **masking**

RT . target masking  
audiometry  
chemisorption  
coverings  
photomasks

**masks**

GS **masks**  
. oxygen masks  
RT chemical defense  
protective clothing

**Masonite (trademark)**

RT cellulose  
∞ construction materials  
trees (plants)  
wood

**masonry**

GS **masonry**  
. bricks  
RT cements  
ceramics  
clays  
concretes  
construction  
∞ construction materials  
mortars (material)  
structural members  
tiles  
veneers

**mass**

DEF A quantity characteristic of a body, which relates the attraction of this body toward another body. Since the mass of a body is not fixed in magnitude, all masses are referred to the standard kilogram, which is a lump of platinum. Used for low mass.

UF *low mass*  
GS **mass**  
. center of mass  
. critical mass  
. galactic mass  
. missing mass (astrophysics)  
. particle mass  
. . electron mass  
. planetary mass  
. stellar mass  
. subcritical mass  
RT center of gravity  
de Broglie wavelengths  
inertia  
mascons  
mass to light ratios  
moments of inertia  
negative matter  
relativistic effects  
weight (mass)

∞ **mass balance**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT balance  
mass distribution  
material balance  
variable mass systems

**mass distribution**

GS distribution (property)  
. **mass distribution**  
RT aerodynamic balance  
aerodynamic stability  
angular distribution  
balance  
ballast (mass)  
charge distribution  
cosmology  
counterbalances  
density wave model  
∞ distribution  
flux density  
force distribution  
galactic mass  
intergalactic media  
interplanetary medium  
interstellar matter  
loading moments  
loads (forces)  
∞ mass balance

mass to light ratios  
meteoroid concentration  
missing mass (astrophysics)  
moment distribution  
moments of inertia  
pressure distribution  
size distribution  
star distribution  
static loads  
structural design criteria  
variable mass systems

**mass drivers**

(added May 1989)  
DEF Electromagnetic devices for the linear acceleration of projectiles or payloads. Applications include orbital insertion and transfer, propulsion systems, and hypervelocity accelerators.  
RT ∞ accelerators  
electromagnetic acceleration  
electromagnetic propulsion  
launchers  
magnetic levitation vehicles  
moon-Earth trajectories  
propulsion  
railgun accelerators  
spacecraft propulsion

*mass filters*

USE **fluid filters**

**mass flow**

GS fluid flow  
. **mass flow**  
RT Crocco-Lee theory  
∞ flow  
flow theory  
gas flow  
Kelvin-Helmholtz instability  
kinetic theory  
laminar flow  
Lewis numbers  
liquid flow  
molecular interactions  
multiphase flow  
pipe flow  
sediment transport  
single-phase flow  
sliding  
slumping  
solids flow  
steady flow  
steam flow  
turbulent flow  
uniform flow  
unsteady flow

**mass flow factors**

RT discharge coefficient  
flow coefficients  
heat transfer coefficients  
heat transmission  
nozzle geometry

**mass flow rate**

GS rates (per time)  
. **mass flow rate**  
RT convective flow  
diffusion coefficient  
flow velocity  
pneumatic probes  
specific impulse  
transient pressures

**mass ratios**

DEF The ratios of the mass of the propellant charge of a rocket to the total mass of the rocket when charged with the propellant.  
GS ratios  
. **mass ratios**  
. . mass to light ratios  
. . mixing ratios  
. . payload mass ratio  
. . propellant mass ratio  
RT metallicity  
pressure ratio  
structural weight

thrust-weight ratio

**mass spectra**

GS spectra  
. **mass spectra**  
RT energy spectra  
molecular spectra  
radiation spectra

**mass spectrometers**

DEF Instruments that are capable of separating ionized molecules of different mass to charge ratio and measuring the respective ion currents. Used for ion spectrometers and retarding ion mass spectrometers.  
UF *ion spectrometers*  
*retarding ion mass spectrometers*  
GS measuring instruments  
. spectrometers  
. . **mass spectrometers**  
RT chemical analysis  
gas analysis  
ion mobility spectroscopy  
ion optics  
microanalysis  
neutron activation analysis  
qualitative analysis  
secondary ion mass spectrometry

*mass spectrometry*

USE **mass spectroscopy**

**mass spectroscopy**

UF *mass spectrometry*  
GS spectroscopy  
. **mass spectroscopy**  
. . inductively coupled plasma mass spectrometry  
. . secondary ion mass spectrometry  
RT chemical analysis  
gas spectroscopy  
magnetic spectroscopy  
nuclear radiation spectroscopy  
spectroscopic analysis  
vacuum spectroscopy

**mass to light ratios**

DEF The ratio of the mass of celestial body to its luminosity.

GS ratios  
. mass ratios  
. . **mass to light ratios**  
RT astronomy  
astrophysics  
galactic radiation  
indexes (ratios)  
luminosity  
luminous intensity  
mass  
mass distribution  
missing mass (astrophysics)  
radiant flux density  
stellar luminosity  
stellar mass

**mass transfer**

RT ablation  
charge transfer  
convective flow  
convective heat transfer  
energy transfer  
gas transport  
gas-liquid interactions  
heat transfer  
Lewis numbers  
porous boundary layer control  
sediment transport  
transferring  
transpiration

**Massachusetts**

GS nations  
. United States  
. . **Massachusetts**

**massaging**

GS therapy  
. **massaging**  
RT fatigue (biology)

## massifs

relaxation (physiology)

### massifs

DEF Massive topographic and structural features, especially in orogenic belts, commonly formed of rocks more rigid than those of their surroundings. These rocks may be protruding bodies of basement rocks, consolidated during earlier orogenies, or younger plutonic bodies.

GS landforms  
. **massifs**  
RT Earth crust

∞ faults  
geological faults  
geology  
mountains

### massive compact halo objects

(added November 1999)

DEF Objects, such as brown dwarfs, black holes, and massive planets, hypothesized to account for the dark matter in the halo of the Milky Way. The signature of these objects is the occasional amplification of the light from extragalactic stars by the gravitational lens effect.

UF *MACHOs (astronomy)*

GS celestial bodies

. **massive compact halo objects**

RT brown dwarf stars  
dark matter  
galactic halos  
gravitational lenses  
Milky Way Galaxy  
missing mass (astrophysics)  
red dwarf stars

### massive stars

(added July 1991)

GS celestial bodies  
. stars  
. . **massive stars**

RT black holes (astronomy)  
degenerate matter  
stellar mass  
supergiant stars  
supermassive stars

### massively parallel processors

(added December 1988)

UF *MPP (computers)*

GS data processing equipment

. computers  
. . digital computers  
. . . parallel computers  
. . . . **massively parallel processors**  
. . . . Connection Machine

RT architecture (computers)  
parallel processing (computers)

### MAST shock tubes

USE **magnetic annular shock tubes**

### mastication

UF *chewing*

RT digesting  
eating  
teeth

### mastoids

GS anatomy  
. head (anatomy)  
. . skull  
. . . **mastoids**  
. . musculoskeletal system  
. . bones  
. . . skull  
. . . . **mastoids**

RT cranium  
ear

### matched filters

GS electromagnetic wave filters

. **matched filters**

RT communication equipment  
demodulators  
∞ filters  
modulators

signal to noise ratios

### matching

RT adjusting  
comparison  
fitting  
homology  
image resolution  
impedance matching  
mismatch (electrical)  
pattern registration

### material absorption

RT absorbents  
absorbers (equipment)  
∞ absorption  
assimilation  
bioavailability  
extraction  
hygroscopicity  
radiation absorption  
sorption  
water treatment

### material balance

GS balance  
. **material balance**  
. . water balance  
RT heat balance  
∞ mass balance  
stoichiometry

### material removal (machining)

USE **machining**

### material strength

USE **mechanical properties**

### ∞ materials

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *substances*

RT ablative materials  
absorbents  
absorbers (materials)  
acceptor materials  
aging (materials)  
aircraft construction materials  
airframe materials  
amorphous materials  
anisotropic media  
binary systems (materials)  
binders (materials)  
bitumens  
boron reinforced materials  
Borsic (tradename)  
brittle materials  
carbonaceous materials  
composite materials  
concrete structures  
∞ construction materials  
contaminants  
cork (materials)  
curl (materials)  
dislocations (materials)  
donor materials  
dredged materials  
electric furnaces  
electrons  
epoxy matrix composites  
fatigue (materials)  
ferrimagnetic materials  
ferroelastic materials  
ferroelectric materials  
ferromagnetic materials  
fissionable materials  
foams  
foils (materials)  
fractures (materials)  
glass  
glassy carbon  
granular materials  
graphite-epoxy composites  
hazardous materials  
holes (electron deficiencies)  
∞ inorganic materials  
insulation  
laminates  
laser materials  
lossless materials

low density materials  
magnetic materials  
maser materials  
materials handling  
materials recovery  
∞ materials science  
∞ materials tests  
matrix materials  
mechanical properties  
metal matrix composites  
molding materials  
nonflammable materials  
optical materials  
organic materials  
paper (material)  
phase change materials  
photoelastic materials  
photoelectric materials  
polymer matrix composites  
porous materials  
pyrolytic materials  
pyrophoric materials  
radioactive materials  
radome materials  
reactor materials  
refractory materials  
reinforcing materials  
reserves  
resources  
self lubricating materials  
semiconductors (materials)  
sizing materials  
smart materials  
solids  
spacecraft construction materials  
sponges (materials)  
strategic materials  
superhybrid materials  
thermochromatic materials  
thermoelectric materials  
thickeners (materials)  
three dimensional composites  
vitreous materials  
Vycor

### materials handling

GS **materials handling**

. ground handling  
. propellant transfer  
. remote handling

RT airfield surface movements

∞ automation  
blowers  
canals  
cargo  
cargo aircraft  
carts  
chemical engineering  
chutes  
∞ containers  
contingency  
conveyors  
cranes  
delivery  
dispensers  
disposal  
distributing  
∞ distribution  
distributors  
dollies  
dumping  
ejection  
ejectors  
emptying  
encapsulating  
excavation  
feeders  
feeding (supplying)  
fluid flow  
fuel pumps  
hauling  
heavy lift airships  
hoppers  
loading operations  
lunar logistics  
marking  
∞ materials  
mechanical engineering  
mines (excavations)

mooring  
 packaging  
 pipelines  
 ∞ pumping  
 pumps  
 railroad humping tests  
 releasing  
 rigging  
 services  
 siphons  
 sprayers  
 spreading  
 stacks  
 ∞ storage  
 tanks (containers)  
 tractors  
 transferring  
 transportation  
 trucks  
 unloading  
 vacuum pumps  
 waste disposal  
 wharves

**materials recovery**

SN (LIMITED TO TREATMENT OF A MATERIAL TO RECLAIM ONE OR MORE OF ITS COMPONENTS)  
 DEF The treatment of a material to reclaim one or more of its components.

GS reclamation  
 . **materials recovery**  
 . . gas recovery  
 . . nuclear fuel reprocessing  
 . . solvolysis  
 . . water reclamation

RT ∞ absorption  
 by-products  
 centrifuging  
 crystallization  
 disposal  
 distillation  
 extraction  
 filtration  
 in situ resource utilization  
 ∞ materials  
 ∞ precipitation  
 precipitation (chemistry)  
 ∞ processing  
 ∞ recovery  
 recycling  
 refining  
 removal  
 ∞ separation  
 waste management

∞ **materials science**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT ceramics  
 laser cutting  
 maser materials  
 ∞ materials  
 metal foams  
 plastics  
 ∞ properties  
 ∞ science

**materials selection**

(added August 2001)

DEF Process of choosing the most appropriate materials for a given application.

GS selection  
 . **materials selection**  
 RT aircraft construction materials  
 airframe materials  
 ∞ construction materials  
 ∞ materials tests  
 optical materials  
 reactor materials  
 spacecraft construction materials  
 structural design  
 structural weight  
 weight reduction

*materials testing reactors*

USE **nuclear research and test reactors**

∞ **materials tests**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT bend tests  
 burst tests  
 Charpy impact test  
 chemical analysis  
 compression tests  
 corrosion tests  
 destructive tests  
 electrophotometry  
 environmental tests  
 fatigue tests  
 fiber pullout  
 fiber pushout  
 fuel tests  
 gas analysis  
 hardness tests  
 high temperature tests  
 impact tests  
 lubricant tests  
 magnetic measurement  
 ∞ materials  
 materials selection  
 mechanical properties  
 metallography  
 microanalysis  
 nanoindentation  
 neutron radiography  
 nondestructive tests  
 propellant tests  
 quality control  
 quality control  
 radiography  
 specifications  
 static tests  
 ∞ tests  
 ultrasonic tests  
 wear tests  
 x ray analysis  
 x ray spectroscopy

*mathematical analysis*

USE **applications of mathematics**

**mathematical logic**

GS **mathematical logic**  
 . algorithms  
 . . backpropagation (artificial intelligence)  
 . . genetic algorithms  
 . . greedy algorithms  
 . . parsing algorithms  
 . . simplex method  
 . . sorting algorithms  
 . axioms  
 . formulas (mathematics)  
 . . Bethe-Heitler formula  
 . lattices (mathematics)  
 . . Boolean algebra  
 . . . Boolean functions  
 . predicate calculus  
 . set theory  
 . . Borel sets  
 . . equivalence  
 . . threshold logic

RT branching (mathematics)  
 functions (mathematics)  
 hypotheses  
 induction (mathematics)  
 instruction sets (computers)  
 ∞ logic  
 philosophy  
 proving  
 temporal logic  
 theorems  
 Turing machines  
 Venn diagrams

**mathematical models**

GS models  
 . **mathematical models**  
 . . analog simulation  
 . . BGK model  
 . . biological models (mathematics)  
 . . digital simulation  
 . . Mandelstam representation  
 . . Petri nets  
 . . Thomas-Fermi model  
 . . turbulence models  
 . . . Baldwin-Lomax turbulence model  
 . . . k-epsilon turbulence model  
 . . . k-omega turbulence model

. . Veneziano model  
 RT aircraft models  
 ∞ applications of mathematics  
 astronomical models  
 asymptotic properties  
 atmospheric models  
 bond graphs  
 broken symmetry  
 chaos  
 computational astrophysics  
 computational grids  
 computational mechanics  
 computer systems simulation  
 computerized simulation  
 continuum modeling  
 control systems design  
 decision theory  
 dynamic models  
 dynamic programming  
 dynamical systems  
 Euler-Bernoulli beams  
 exhaust flow simulation  
 experiment design  
 factorial design  
 flow charts  
 footprints  
 forecasting  
 functions (mathematics)  
 game theory  
 goodness of fit  
 graph theory  
 inelastic stress  
 inventory controls  
 large eddy simulation  
 likelihood ratio  
 linear prediction  
 lofting  
 lumped parameter systems  
 method of moments  
 ∞ missile simulators  
 model reference adaptive control  
 Monte Carlo method  
 multiscale models  
 numerical weather forecasting  
 ocean models  
 operations research  
 outliers (statistics)  
 parameter identification  
 parameterization  
 quantiles  
 queueing theory  
 regression coefficients  
 risk  
 robustness (mathematics)  
 scheduling  
 similarity theorem  
 simulation  
 spacecraft models  
 spatial dependencies  
 statistical distributions  
 stochastic processes  
 system identification  
 systems analysis  
 systems engineering  
 systems simulation  
 three dimensional models  
 trajectory analysis  
 two dimensional bodies  
 two dimensional models  
 validity  
 war games

**mathematical programming**

SN (LIMITED TO MATHEMATICAL OPTIMIZATION THEORY--EXCLUDES COMPUTER PROGRAMMING)  
 GS optimization  
 . **mathematical programming**  
 . . dynamic programming  
 . . linear programming  
 . . nonlinear programming  
 . . quadratic programming  
 RT game theory  
 operations research  
 ∞ programming  
 simplex method

**mathematical tables**

GS tables (data)  
 . **mathematical tables**

## mathematics

- RT information
  - numerical analysis
  - random numbers
- ∞ **mathematics**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF The study of the logical relationships among abstract entities. These relationships are expressed in numbers, symbols, and signs and may also be applied to concrete instances such as measures and properties of shapes. The main subdivisions include algebra, geometry, and analysis.
  - RT algebra
    - analysis (mathematics)
    - axioms
    - bond graphs
    - calculus
    - current algebra
    - duality theorem
    - formulas (mathematics)
    - fractals
    - functions (mathematics)
    - geometry
    - inequalities
    - information theory
    - integrals
    - Latin square method
    - lattices (mathematics)
    - martingales
    - morphology
    - number theory
    - numerical analysis
    - primitive equations
  - ∞ principles
  - ∞ probability theory
  - ∞ rings (mathematics)
  - ∞ science
    - series expansion
    - stars (mathematics)
    - statistical analysis
    - superposition (mathematics)
    - symbols
    - theorems
- Mathieu equation*
  - USE **Mathieu function**
- Mathieu function**
  - UF *Mathieu equation*
  - GS analysis (mathematics)
    - . complex variables
    - . . **Mathieu function**
  - RT boundary value problems
  - differential equations
  - eigenvectors
  - ∞ equations
  - Hill determinant
  - orthogonal functions
- Matra missile**
  - GS missiles
    - . air to air missiles
    - . . **Matra missile**
  - RT solid propellant rocket engines
- ∞ **matrices**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT composite materials
  - epoxy matrix composites
  - eutectic composites
  - ∞ grids
  - ∞ imbeddings
  - lattices (mathematics)
  - matrices (circuits)
  - matrices (mathematics)
  - metal matrix composites
  - monotectic alloys
  - polymer matrix composites
- matrices (circuits)**
  - GS circuits
    - . **matrices (circuits)**
  - RT logic circuits
  - ∞ matrices

- switching circuits
- matrices (mathematics)**
  - UF *differential algebra*
  - matrix analysis*
  - GS algebra
    - . vector spaces
    - . . **matrices (mathematics)**
    - . . . adjoints
    - . . . canonical forms
    - . . . eigenvalues
    - . . . eigenvectors
    - . . . Hessian matrices
    - . . . Jordan form
    - . . . stiffness matrix
  - RT arrays
    - chiral dynamics
    - determinants
    - energy methods
    - factor analysis
    - finite element method
    - Gaussian elimination
    - Hermitian polynomial
    - isoperimetric problem
    - linear equations
    - linear programming
    - linear transformations
    - lumped parameter systems
  - ∞ matrices
    - method of moments
    - roots of equations
    - simplex method
    - simultaneous equations
    - subgroups
    - U spin space
    - Walsh function
- matrix analysis*
  - USE **matrices (mathematics)**
- matrix management**
  - DEF An organized approach to administration of a program by defining and structuring all elements to form a single system with components united by interaction.
  - GS management
    - . **matrix management**
  - RT allocations
  - logistics
  - management methods
  - ∞ methodology
  - operations research
  - productivity
  - project planning
  - scheduling
  - tasks
- matrix materials**
  - DEF The ingredients used as binding agents to produce composite materials.
  - RT bismaleimide
  - ceramic matrix composites
  - composite materials
  - debonding (materials)
  - epoxy matrix composites
  - fiber composites
  - fiber-matrix interfaces
  - functionally gradient materials
  - laminates
  - ∞ materials
  - metal matrix composites
  - polymer matrix composites
  - reinforcing materials
  - resin matrix composites
  - resin transfer molding
- matrix methods**
  - SN (LIMITED TO METHODS FOR STRUCTURAL ANALYSIS)
  - UF *matrix stress calculation*
  - GS structural analysis
    - . **matrix methods**
  - RT equilibrium methods
  - ∞ methodology
  - NASTRAN

- spline functions
- matrix stress calculation*
  - USE **matrix methods**
- matrix theory**
  - RT operators (mathematics)
  - ∞ theories
- matter (physics)**
  - GS **matter (physics)**
    - . dark matter
    - . degenerate matter
    - . negative matter
    - . rotating matter
    - . . rotating fluids
    - . . . rotating liquids
    - . . . rotating plasmas
  - RT antimatter
  - condensed matter physics
  - extraterrestrial matter
  - ∞ physics
- matter-antimatter propulsion**
  - (added December 1988)
  - DEF Spacecraft propulsion by use of matter-antimatter annihilation reactions.
  - GS propulsion
    - . spacecraft propulsion
    - . . **matter-antimatter propulsion**
  - RT annihilation reactions
  - antimatter
  - interplanetary flight
  - interplanetary spacecraft
  - interstellar travel
  - negative matter propulsion
  - nuclear propulsion
  - positron annihilation
  - proton-antiproton interactions
  - rocket engines
- MATTS (systems)**
  - UF *multiple target trajectory systems*
  - GS networks
    - . tracking networks
    - . . **MATTS (systems)**
  - RT abort trajectories
  - airborne equipment
  - angular correlation
  - target acquisition
- maturing*
  - USE **growth**
- Mauler missile**
  - GS missiles
    - . anti-aircraft missiles
    - . . **Mauler missile**
    - . . antimissile missiles
    - . . **Mauler missile**
    - . surface to air missiles
    - . . **Mauler missile**
  - RT single stage rocket vehicles
  - solid propellant rocket engines
- Mauritania**
  - GS nations
    - . **Mauritania**
  - RT Africa
- Mauritius**
  - (added February 1989)
  - GS landforms
    - . islands
    - . . **Mauritius**
  - nations
    - . **Mauritius**
  - RT Africa
  - Indian Ocean
- Maverick missiles**
  - GS missiles
    - . air to surface missiles
    - . . **Maverick missiles**
- Max Holste MH-262 aircraft*
  - USE **MH-262 aircraft**
- maxima**
  - GS analysis (mathematics)
  - . real variables

- . . extremum values
- . . . **maxima**
- RT apexes
- calculus of variations
- cusps (mathematics)
- minima
- optimization
- ∞ peaks
- penalty function
- range (extremes)
- zenith
- maximum entropy method**
- DEF Procedure used in estimating high resolution power spectra from short data lengths.
- GS entropy (statistics)
- . **maximum entropy method**
- spectrum analysis
- . **maximum entropy method**
- RT distribution functions
- entropy
- Fourier transformation
- information theory
- ∞ methodology
- power spectra
- signal processing
- signal to noise ratios
- statistical analysis
- time series analysis
- maximum likelihood estimates**
- RT confidence limits
- Cramer-Rao bounds
- forecasting
- goodness of fit
- likelihood ratio
- parameter identification
- predictions
- reliability
- risk
- system identification
- maximum principle**
- RT complex variables
- differential equations
- elliptic differential equations
- harmonic functions
- pontryagin principle
- real variables
- maximum usable frequency**
- DEF For a given distance from a transmitter, the highest frequency at which sky waves can be received.
- GS frequencies
- . **maximum usable frequency**
- RT frequency assignment
- frequency reuse
- high frequencies
- very high frequencies
- Maxwell bodies**
- RT classical mechanics
- continuum mechanics
- Hookes law
- oscillation dampers
- relaxation time
- Maxwell equation**
- RT Biot-Savart law
- Boltzmann-Vlasov equation
- Born-Infeld theory
- electricity
- electrodynamics
- electromechanics
- ∞ equations
- Gauss equation
- magnetic charge density
- magnetic properties
- magnetoelectric media
- perfectly matched layers
- Poynting theorem
- ∞ Stokes law
- Maxwell fluids**
- RT compressible fluids
- fluid mechanics
- ∞ fluids
- rheology
- viscoelasticity
- viscous flow
- viscous fluids
- Maxwell-Boltzmann density function**
- UF *Maxwellian distribution (density)*
- GS functions (mathematics)
- . **Maxwell-Boltzmann density function**
- statistical analysis
- . **Maxwell-Boltzmann density function**
- RT density distribution
- kinetic theory
- probability theory
- statistical mechanics
- Maxwellian distribution (density)*
- USE **Maxwell-Boltzmann density function**
- Maxwell-Mohr method**
- RT deflection
- ∞ equilibrium
- ∞ methodology
- static deformation
- trusses
- Mayer problem**
- RT ∞ condensation
- critical point
- Gibbs free energy
- ∞ molecular physics
- ∞ problems
- supersaturation
- maypole antennas**
- DEF A class of antennas which use the deployable reflector concept for large space systems applications.
- GS antennas
- . **maypole antennas**
- RT antenna design
- large space structures
- space erectable structures
- maze learning**
- GS learning
- . **maze learning**
- RT problem solving
- MB-1 rocket vehicle*
- USE **Genie rocket vehicle**
- MBM junctions**
- DEF Diode devices using metal-barrier-metal layers. Used for metal-barrier-metal junctions.
- UF *metal-barrier-metal junctions*
- GS semiconductor junctions
- . **MBM junctions**
- RT barrier layers
- ∞ barriers
- junction transistors
- solid state devices
- Mcdonnell aircraft**
- GS McDonnell Douglas aircraft
- . **Mcdonnell aircraft**
- . . C-9 aircraft
- . . DC 10 aircraft
- . . F-4 aircraft
- . . F-101 aircraft
- RT ∞ aircraft
- McDonnell Douglas aircraft**
- GS **McDonnell Douglas aircraft**
- . C-17 aircraft
- . Douglas aircraft
- . . A-1 aircraft
- . . A-3 aircraft
- . . A-4 aircraft
- . . B-66 aircraft
- . . C-9 aircraft
- . . C-47 aircraft
- . . C-54 aircraft
- . . C-118 aircraft
- . . C-124 aircraft
- . . C-133 aircraft
- . . D-558 aircraft
- . . DC 3 aircraft
- . . DC 7 aircraft
- . . DC 8 aircraft
- . . DC 9 aircraft
- . . DC 10 aircraft
- . . PD-808 aircraft
- . . X-3 aircraft
- . F-18 aircraft
- . Mcdonnell aircraft
- . . C-9 aircraft
- . . DC 10 aircraft
- . . F-4 aircraft
- . . F-101 aircraft
- . MD 11 aircraft
- . MD 80 aircraft
- . X-36 aircraft
- RT ∞ aircraft
- Boeing aircraft
- McLaurin series*
- USE **MacLaurin series**
- Mcleod gages**
- GS measuring instruments
- pressure gages
- . vacuum gages
- . . . **Mcleod gages**
- vacuum apparatus
- vacuum gages
- . **Mcleod gages**
- RT ionization gages
- Knudsen gages
- Pirani gages
- pressure measurement
- McMurdo sound**
- GS regions
- . polar regions
- . . Antarctic regions
- . . . **McMurdo sound**
- . remote regions
- . . Antarctic regions
- . . . **McMurdo sound**
- sounds (topographic features)
- . **McMurdo sound**
- Southern Hemisphere
- . Antarctic regions
- . . **McMurdo sound**
- RT Ross ice shelf
- MCR reactors*
- USE **military compact reactors**
- MD 11 aircraft**
- (added October 1994)*
- UF *DC 11 aircraft*
- GS commercial aircraft
- . **MD 11 aircraft**
- jet aircraft
- . **MD 11 aircraft**
- McDonnell Douglas aircraft
- . **MD 11 aircraft**
- passenger aircraft
- . **MD 11 aircraft**
- transport aircraft
- . **MD 11 aircraft**
- RT ∞ aircraft
- MD 80 aircraft**
- (added October 1994)*
- GS commercial aircraft
- . **MD 80 aircraft**
- jet aircraft
- . **MD 80 aircraft**
- McDonnell Douglas aircraft
- . **MD 80 aircraft**
- passenger aircraft
- . **MD 80 aircraft**
- transport aircraft
- . **MD 80 aircraft**
- RT ∞ aircraft



## mean

DC 9 aircraft  
MDA  
USE **multiple docking adapters**  
ME P-160 aircraft  
USE **P-160 aircraft**  
ME P-308 aircraft  
USE **P-308 aircraft**  
meadowlands  
USE **grasslands**  
MEAM (physical chemistry)  
(added February 1998)  
USE **embedded atom method**

## mean

GS average  
. **mean**  
moments  
. distribution moments  
. . **mean**  
RT median (statistics)  
mode (statistics)  
normality  
quality control  
range (extremes)  
statistical analysis  
variance (statistics)

## mean free path

DEF Of any particle, the average distance that a particle travels between successive collisions with the other particles of an ensemble. Specifically, the average distance traveled by the molecules of a perfect gas between consecutive collisions with one another. For any process the reciprocal of the cross section per unit volume for that process.

RT collision parameters  
∞ cross sections  
Knudsen flow  
particle collisions  
particle motion  
∞ paths  
scattering  
vacuum

## mean square values

DEF In statistics, values representing the average of the sum of the squares of the deviations from the mean value.

GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **mean square values**  
RT algorithms  
error analysis  
least squares method

## mean time between failures

USE **MTBF**

## meanders

DEF Freely developing sinuous curves, bends, loops, turns, or windings in the courses of streams. They are produced by mature streams swinging from side to side as they flow across flood plains or shift course laterally toward the convex side of an original curve.

RT open channel flow  
rapids  
river basins  
rivers  
streams  
topography  
valleys

## measure and integration

UF *integration (real variables)*  
*measure theory*  
*Riemann integral*  
GS analysis (mathematics)  
. real variables  
. . **measure and integration**  
. . . binary integration  
. . . Borel sets  
. . . functional integration  
. . . integral calculus

. . . J integral  
. . . Lebesgue theorem  
. . . numerical integration  
. . . Runge-Kutta method  
. . . Stieltjes integral  
. . . weighting functions  
RT Fourier analysis

## measure theory

USE **measure and integration**

## ∞ measurement

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF The technical action required to assign values (numbers) to represent certain properties or attributes, using rules based on scientific laws. Used for determination, measuring, and quantization.

UF *determination*  
*measuring*  
*quantization*  
RT acceleration measurement  
accuracy  
acoustic measurement  
airborne range and orbit  
determination  
aircraft instruments  
analog data  
astrometry  
audiometry  
chemical analysis  
confidence limits  
consistency  
counting  
∞ data

definition  
densimeters  
density measurement  
depth measurement  
detection  
dilatometry  
dimensional measurement  
Downrange Antimissile Measurement Program  
downrange measurement  
drag measurement  
Earth terminal measurement system  
electrical measurement  
electromagnetic measurement  
electromagnetic noise measurement  
ellipsometry  
estimating  
evaluation  
examination  
flow measurement  
frequency measurement  
friction measurement  
gamma ray absorptiometry  
geometry  
gravimetry  
heat measurement  
high alt target and background  
measurement  
humidity measurement  
identifying  
in situ measurement  
International System of Units  
latitude measurement  
longitude measurement  
macroscopic equations  
magnetic measurement  
∞ measures  
measuring instruments  
mechanical measurement  
metrology  
monitors  
noise measurement  
nonintrusive measurement  
optical measurement  
optometry  
photographic measurement  
pneumography  
precipitation measurement  
pressure measurement  
proving  
pupillometry  
radar measurement  
radiation measurement

radioactive age determination  
rangefinding  
signal measurement  
size determination  
sounding  
sphygmography  
standards  
strain measurement  
synoptic measurement  
temperature measurement  
thrust measurement  
time measurement  
trajectory measurement  
ultrasonic densimeters  
units of measurement  
velocity measurement  
vibration measurement  
weight measurement  
wind measurement

## ∞ measures

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT criteria  
∞ measurement  
standards

## measuring

USE **measurement**

## measuring instruments

UF *fluxmeters*  
*gages*  
*meters*  
*rate meters*  
GS **measuring instruments**  
. accelerometers  
. . strain gage accelerometers  
. ammeters  
. . micromillimeters  
. . thermoelement ammeters  
. analyzers  
. . engine analyzers  
. . signal analyzers  
. anemometers  
. . drag force anemometers  
. . hot-film anemometers  
. . hot-wire anemometers  
. . laser anemometers  
. . sonic anemometers  
. balloon-borne instruments  
. bathymeters  
. burettes  
. calorimeters  
. . bomb calorimeters  
. . drop calorimeters  
. . flame calorimeters  
. comparators  
. conductivity meters  
. . electrical conductivity meters  
. coulometers  
. counters  
. . radiation counters  
. . . Cerenkov counters  
. . . electron counters  
. . . Geiger counters  
. . . neutron counters  
. . . neutron spectrometers  
. . . particle telescopes  
. . . proportional counters  
. . . quantum counters  
. . . scintillation counters  
. . . spark chambers  
. deformeters  
. densimeters  
. . ultrasonic densimeters  
. densitometers  
. . microdensitometers  
. distance measuring equipment  
. . altimeters  
. . . laser altimeters  
. . . radio altimeters  
. . . geodimeters  
. . range finders  
. . . optical range finders  
. . . . laser range finders  
. . stadimeters  
. tellurometers  
. dynamometers

- . elastometers
- . electrometers
- . electron probes
- . engine monitoring instruments
- . ergometers
- . eudiometers
- . extensometers
- . field intensity meters
- . flame probes
- . flight recorders
- . . flight load recorders
- . flowmeters
- . . gas meters
- . . hot-wire flowmeters
- . . rheometers
- . force vector recorders
- . fuel gages
- . . capacitive fuel gages
- . galvanometers
- . Gerdiem condensers
- . goniometers
- . . photogoniometers
- . . radiogoniometers
- . gravimeters
- . gravity gradiometers
- . heliometers
- . . pyroheliometers
- . hydrometers
- . hypsometers
- . impedance probes
- . . radio frequency impedance probes
- . indicating instruments
- . . approach indicators
- . . astrolabes
- . . attitude indicators
- . . . gyro horizons
- . . cloud height indicators
- . . compasses
- . . . gyrocompasses
- . . . magnetic compasses
- . . . solar compasses
- . . flow direction indicators
- . . wind vanes
- . . position indicators
- . . . plan position indicators
- . . . radio direction finders
- . . . spacecraft position indicators
- . . smoke detectors
- . . speed indicators
- . . tachometers
- . . weight indicators
- . . . microbalances
- . . . strain gage balances
- . . . thermobalances
- . interferometers
- . . etalons
- . . Fabry-Perot interferometers
- . . infrared interferometers
- . . Mach-Zehnder interferometers
- . . Michelson interferometers
- . . microwave interferometers
- . . phase switching interferometers
- . . radio interferometers
- . ion probes
- . ion traps (instrumentation)
- . laser doppler velocimeters
- . lysimeters
- . magnetic probes
- . magnetometers
- . . variometers
- . mechanograms
- . meteorological instruments
- . tribometers
- . . barometers
- . . cloud height indicators
- . . dropsondes
- . . radiometeorographs
- . . radiosondes
- . . . ionosondes
- . . . rawinsondes
- . . ozonesondes
- . . rain gages
- . . weather data recorders
- . . wind vanes
- . micrometers
- . microwave probes
- . . microwave plasma probes
- . microwave sensors
- . . Advanced Microwave Sounding Unit
- . moisture meters
- . . hygrometers
- . . psychrometers
- . monochromators
- . noise meters
- . ohmmeters
- . optical measuring instruments
- . . cathetometers
- . . diffractometers
- . . Ebert spectrometers
- . . ellipsometers
- . . etalons
- . . geodimeters
- . . haploscopes
- . . infrared spectrometers
- . . . filter wheel infrared spectrometers
- . . light scattering meters
- . . microdensitometers
- . . nephelometers
- . . oculometers
- . . optical pyrometers
- . . optical range finders
- . . . laser range finders
- . . photogoniometers
- . . photometers
- . . . electrophotometers
- . . . ultraviolet spectrometers
- . . . . high dispersion spectrographs
- . . . . Total Ozone Mapping Spectrometer
- . . . quantum well infrared photodetectors
- . . . ultraviolet spectrophotometers
- . . polarimeters
- . . reflectometers
- . . . microwave reflectometers
- . . refractometers
- . . sextants
- . . spectrophotometers
- . . . infrared spectrophotometers
- . . . ultraviolet spectrophotometers
- . . transits
- . . . theodolites
- . . . . cinetheodolites
- . . transmissometers
- . oscillographs
- . oxygen analyzers
- . penetrometers
- . plasma probes
- . . electrostatic probes
- . . polariscopes
- . . Senarmont polariscopes
- . . potentiometers (instruments)
- . . pressure gages
- . . barometers
- . . manometers
- . . osmometers
- . . piezoelectric gages
- . . piezometers
- . . vacuum gages
- . . ionization gages
- . . . alphasources
- . . . . Bayard-Alpert ionization gages
- . . . . Penning gages
- . . . . Philips ionization gages
- . . . Knudsen gages
- . . McLeod gages
- . . Pirani gages
- . . profilometers
- . protractors
- . radiation measuring instruments
- . . actinometers
- . . . infrared spectrometers
- . . . . filter wheel infrared spectrometers
- . . . pyranometers
- . . . radiometers
- . . . . Dicke radiometers
- . . . . infrared detectors
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners
- . . . . . visible infrared spin scan radiometer
- . . . . quantum well infrared photodetectors
- . . . . ultraviolet spectrophotometers
- . . . x ray detectors
- . . bolometers
- . . Ebert spectrometers
- . . electrostatic probes
- . . Fabry-Perot spectrometers
- . . hodoscopes
- . . infrared instruments
- . . . infrared detectors
- . . . FLIR detectors
- . . . infrared radiometers
- . . . . Advanced Very High Resolution Radiometer
- . . . . infrared scanners
- . . . . visible infrared spin scan radiometer
- . . . quantum well infrared photodetectors
- . . . infrared interferometers
- . . . infrared spectrometers
- . . . . filter wheel infrared spectrometers
- . . . infrared spectrophotometers
- . . . photometers
- . . . . electrophotometers
- . . . ultraviolet spectrometers
- . . . . high dispersion spectrographs
- . . . . Total Ozone Mapping Spectrometer
- . . . quantum well infrared photodetectors
- . . . ultraviolet spectrophotometers
- . . radiation counters
- . . . Cerenkov counters
- . . . electron counters
- . . . Geiger counters
- . . . neutron counters
- . . . . neutron spectrometers
- . . . particle telescopes
- . . . proportional counters
- . . . quantum counters
- . . . scintillation counters
- . . . spark chambers
- . . radiation detectors
- . . . dosimeters
- . . . . threshold detectors (dosimeters)
- . . . Golay detector cells
- . . . silicon radiation detectors
- . . riometers
- . . radiometers
- . . resonance probes
- . . respirometers
- . . satellite-borne instruments
- . . Advanced Microwave Sounding Unit
- . . Advanced Very High Resolution Radiometer
- . . . AMPS (satellite payload)
- . . . MISR (radiometry)
- . . . Total Ozone Mapping Spectrometer
- . . scatterometers
- . shock measuring instruments
- . sondes
- . . dropsondes
- . . Judi-Dart rocket
- . . radiosondes
- . . . ionosondes
- . . . rawinsondes
- . . ozonesondes
- . . spectrometers

- . . Ebert spectrometers
- . . Fabry-Perot spectrometers
- . . gamma ray spectrometers
- . . imaging spectrometers
- . . infrared spectrometers
- . . . filter wheel infrared spectrometers
- . . laser spectrometers
- . . mass spectrometers
- . . microwave spectrometers
- . . neutron spectrometers
- . . Solar Backscatter UV Spectrometer
- . . solar spectrometers
- . . spectroheliographs
- . . time of flight spectrometers
- . . ultraviolet spectrometers
- . . . high dispersion spectrographs
- . . . Total Ozone Mapping Spectrometer
- . . Alpha Magnetic Spectrometer
- . . x ray spectrometers
- . sputtering gages
- . strain gages
- . temperature measuring instruments
- . . bathythermographs
- . . optical pyrometers
- . . pneumatic probes
- . . pyrometers
- . . . radiation pyrometers
- . . . thermocouple pyrometers
- . . temperature probes
- . . thermometers
- . . . resistance thermometers
- . tensiometers
- . tensometers
- . thermal conductivity gages
- . tiltmeters
- . time measuring instruments
- . . clocks
- . . . atomic clocks
- . . . autonomous spacecraft clocks
- . . . chronometers
- . . timing devices
- . . titrimeters
- . . torquemeters
- . . turbulence meters
- . . vibration meters
- . . seismographs
- . . . lunar seismographs
- . . viscometers
- . . voltmeters
- . . millivoltmeters
- . . wattmeters
- RT aircraft instruments
- automatic control
- automatic test equipment
- bioinstrumentation
- calibrating
- circumsolar telescopes
- control moment gyroscopes
- controllers
- ∞ detectors
- drag measurement
- duochromators
- electric bridges
- electrical measurement
- flight instruments
- forest fire detection
- Fraunhofer line discriminators
- IMBLMS
- instrument receivers
- instrument transmitters
- ∞ instruments
- International System of Units
- laboratory equipment
- landing instruments
- large aperture seismic array
- local scientific survey module
- lunar ranging
- ∞ measurement
- metrology
- microinstrumentation
- monitors
- navigation instruments
- ∞ probes
- propellant actuated instruments
- radio probing
- radio telemetry
- rapid ballistics identification

- recording instruments
- remote sensors
- rocket-borne instruments
- Ronchi test
- satellite instruments
- ∞ sensors
- sound detecting and ranging
- spacecraft instruments
- synchrosopes
- telemetry
- ∞ test equipment
- transducers
- ultrasonic scanners
- Venturi tubes
- Wheatstone bridges
- wind tunnel calibration

**mecamylamine**

- GS organic compounds
- . amines
- . . **mecamylamine**
- terpenes
- . **mecamylamine**

**mechanical devices**

- RT cams
- clamps
- clips
- clutches
- ∞ devices
- ∞ equipment
- holders
- jigs
- levers
- linkages
- machine tools
- ∞ mechanism
- mechanization
- tools

*mechanical drawings*

USE **engineering drawings**

**mechanical drives**

- UF *rotary drives*
- GS **mechanical drives**
- . magnetic tape transports
- . . propeller drive
- . . . helicopter propeller drive
- . . transmissions (machine elements)
- RT clutches
- counter-rotating wheels
- coupling
- couplings
- ∞ drives
- ∞ gear
- gear teeth
- gears
- magnetolectric media
- ∞ power transmission
- shafts (machine elements)
- vehicle wheels
- wind tunnel drives
- windmills (windpowered machines)

**mechanical engineering**

DEF Branch of engineering dealing with the design, development and operation of machines including mechanical devices and prime movers, vehicles, machine tools, and manufacturing machinery.

- RT aeronautical engineering
- aerospace engineering
- ∞ engineering
- fluid flow
- flywheels
- furnaces
- heat transfer
- machine tools
- ∞ machinery
- maintenance
- materials handling
- stress analysis
- thermodynamics

vibration tests

*mechanical fingers*

USE **end effectors**

*mechanical hands*

USE **end effectors**

**mechanical impedance**

- GS impedance
- . **mechanical impedance**
- RT attenuation
- damping
- friction
- impedance measurement

**mechanical measurement**

- SN (MEASUREMENT OF MECHANICAL PROPERTIES, QUANTITIES OR CONDITIONS)
- GS **mechanical measurement**
- . displacement measurement
- . drag measurement
- . flow measurement
- . . particle image velocimetry
- . friction measurement
- . pressure measurement
- . stress measurement
- . . x ray stress measurement
- . thrust measurement
- . velocity measurement
- . . particle image velocimetry
- . . wind velocity measurement
- . vibration measurement
- . wind measurement
- . . wind velocity measurement
- RT accelerometers
- acoustic measurement
- deformeters
- density measurement
- depth measurement
- dynamometers
- extensometers
- flowmeters
- ∞ measurement
- strain gages
- tensiometers
- torquemeters
- weight indicators

**mechanical oscillators**

- GS oscillators
- . **mechanical oscillators**
- . . pendulums
- . . . gyoscopic pendulums
- RT electric choppers
- harmonic oscillators
- reciprocation
- resonant vibration
- vibration

**mechanical properties**

- UF *material strength*
- meteorite compression tests*
- strength of materials*
- GS **mechanical properties**
- . brittleness
- . bulk modulus
- . cold strength
- . compressibility
- . compressive strength
- . creep properties
- . . creep rupture strength
- . . shear creep
- . . steady state creep
- . . tensile creep
- . creep strength
- . dimensional stability
- . . structural stability
- . . . shell stability
- . ductility
- . earthquake resistance
- . elastic properties
- . . aeroelasticity
- . . . aeroservoelasticity
- . . . aerothermoelasticity
- . . anelasticity
- . . elastoplasticity
- . . hydroelasticity
- . . hypoelasticity
- . . magnetostriction

- . . modulus of elasticity
- . . . dynamic modulus of elasticity
- . . photoelasticity
- . . . photoviscoelasticity
- . . proportional limit
- . . thermoelasticity
- . . . aérothermoelasticity
- . . viscoelasticity
- . . . photoviscoelasticity
- . . . thermoviscoelasticity
- . . ferroelasticity
- . electrostriction
- . fatigue life
- . fiber strength
- . flexibility
- . fracture strength
- . . flexural strength
- . hardness
- . . microhardness
- . . . Knoop hardness
- . . Rockwell hardness
- . . Vickers hardness
- . high strength
- . impact strength
- . malleability
- . modular ratios
- . notch strength
- . piezoelectricity
- . plastic properties
- . . elastoplasticity
- . . photoplasticity
- . . superplasticity
- . . thermoplasticity
- . . viscoplasticity
- . . yield point
- . Poisson ratio
- . resilience
- . set
- . shear properties
- . . shear strength
- . stiffness
- . stress cycles
- . stress ratio
- . stress relaxation
- . tensile properties
- . . tensile strength
- . thermal resistance
- . toughness
- . . notch sensitivity
- . wear resistance
- . . abrasion resistance
- . weld strength
- . yield strength
- . . load carrying capacity
- . . microyield strength
- RT acoustic properties
- aging (materials)
- anisotropy
- buoyancy
- cast alloys
- coefficients
- compressing
- compression loads
- deformation
- durability
- elongation
- fatigue (materials)
- ferritic stainless steels
- fiber orientation
- flatness
- ∞ high resistance
- hysteresis
- impedance
- interfacial tension
- interference fit
- internal friction
- isotropy
- J integral
- ∞ low resistance
- ∞ materials
- ∞ materials tests
- ∞ metallurgy
- micromechanics
- microporosity
- nanoindentation
- peeling
- permeability
- ∞ physical properties
- propellant properties
- ∞ properties
- radiation effects
- reliability
- ∞ rigidity
- roughness
- ruggedness
- shear strain
- shear stress
- shock resistance
- solid mechanics
- specifications
- specimen geometry
- strain rate
- ∞ strength
- stress concentration
- stresses
- structural failure
- supercooling
- surface defects
- surface properties
- surface roughness
- tearing
- temperature inversions
- textures
- tolerances (mechanics)
- triaxial stresses
- triboluminescence
- weathering
- mechanical resonance*
- USE **resonant vibration**
- mechanical shock**
- UF *jarring*
- GS **mechanical shock**
- . hydraulic shock
- RT acceleration (physics)
- high acceleration
- hypervelocity impact
- impact
- impact acceleration
- ∞ shock
- shock absorbers
- shock resistance
- shock spectra
- shock waves
- vibration
- mechanical twinning**
- GS twinning
- . **mechanical twinning**
- RT crystal defects
- crystal growth
- crystal structure
- work hardening
- mechanics (physics)**
- SN (LIMITED TO GENERAL DISCUSSIONS OF THE BROAD BRANCH OF PHYSICS RELATED TO MOTION AND THE BEHAVIOR OF PHYSICAL SYSTEMS. USE OF A MORE SPECIFIC TERM IS RECOMMENDED.)
- DEF The branch of physics that studies the motion of bodies and the behavior of physical systems under the influence of internal and external forces.
- GS **mechanics (physics)**
- . classical mechanics
- . . space mechanics
- . . . astrodynamics
- . . . celestial mechanics
- . . . orbital mechanics
- . . . . Kepler laws
- . . . . minimum variance orbit determination
- . quantum mechanics
- . . Pauli exclusion principle
- . . quantum electrodynamics
- . fluid mechanics
- . . fluid dynamics
- . . . computational fluid dynamics
- . . . gas dynamics
- . . . . aerodynamics
- . . . . . aérothermodynamics
- . . . . . hypersonics
- . . . . . rotor aerodynamics
- . . . . . supersonics
- . . . . . unsteady aerodynamics
- . . . . . interactional aerodynamics
- . . . . . rarefied gas dynamics
- . . . hydrodynamics
- . . . . elastohydrodynamics
- . . . . electrohydrodynamics
- . . . . magnetohydrodynamics
- . . . rotors
- . . . vortex shedding
- . . hydromechanics
- . . . hydrodynamics
- . . . . elastohydrodynamics
- . . . . electrohydrodynamics
- . . . . magnetohydrodynamics
- . . . hydrostatics
- . . . . magnetohydrostatics
- . . pneumatics
- . solid mechanics
- . . fracture mechanics
- . computational mechanics
- . continuum mechanics
- . flight mechanics
- RT ∞ dynamics
- electromechanics
- ∞ hydraulics
- kinematics
- kinetics
- loads (forces)
- ∞ mechanism
- megamechanics
- micromechanics
- statics
- statistical mechanics
- ∞ **mechanism**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT ∞ machinery
- mechanical devices
- mechanics (physics)
- ∞ methodology
- mechanization**
- RT ∞ automation
- data processing
- depersonalization
- ∞ machinery
- man machine systems
- mechanical devices
- ∞ operations
- systems engineering
- tooling
- tools
- mechanograms**
- GS measuring instruments
- . **mechanograms**
- medical equipment
- . **mechanograms**
- recording instruments
- . **mechanograms**
- RT muscular function
- mechanoreceptors**
- DEF Nerve endings that react to mechanical stimuli, such as touch, tension, and acceleration.
- GS anatomy
- . sense organs
- . . **mechanoreceptors**
- receptors (physiology)
- . **mechanoreceptors**
- RT sensitometry
- meclizine**
- GS halogen compounds
- . chlorine compounds
- . . **meclizine**
- organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . azines
- . . . . **meclizine**
- pyrazines
- . azines
- . . **meclizine**
- media**
- SN (EXCLUDES COMMUNICATION TECHNIQUES)
- GS **media**
- . anisotropic media
- . . anisotropic fluids

## median (statistics)

- . elastic media
- . intergalactic media
- . interplanetary medium
- . . . interplanetary dust
- . . . . meteoroid dust clouds
- . . . . zodiacal dust
- . . interplanetary gas

RT ∞ channels

## median (statistics)

- RT average  
distribution moments  
errors  
mean  
mode (statistics)  
normality  
norms  
quality control  
statistical analysis  
∞ tests

## mediastinum

- RT septum  
tissues (biology)

## mediation

- RT labor  
management planning

## medical electronics

- RT echoencephalography  
electrocardiography  
electroencephalography  
electromyography  
∞ electronics  
electroplethysmography  
electroretinography  
lab-on-a-chip devices  
telemedicine

## medical equipment

- GS **medical equipment**  
. artificial cardiac pacemaker  
. artificial heart valves  
. blood pumps  
. cardiostimulators  
. endoscopes  
. mechanograms  
. prosthetic devices  
. . . artificial ears  
. respirators  
. stethoscopes  
. stretchers  
. surgical instruments  
. syringes  
. tourniquets  
. x ray apparatus  
. . . . . x ray tubes

- RT cardiography  
dentistry  
diagnosis  
echoencephalography  
electroencephalography  
emergency life sustaining systems  
∞ equipment  
first aid  
fluoroscopy  
hospitals  
IMBLMS  
∞ medicine  
microtomy  
mobile quarantine facility  
telemedicine  
therapy

## medical personnel

- GS personnel  
. **medical personnel**  
. . . flight nurses  
. . . physicians  
. . . surgeons  
. . . . flight surgeons
- RT ∞ medicine

## medical phenomena

- RT diving (underwater)

phenomenology

## medical science

- GS **medical science**  
. aerospace medicine  
. . . aviation psychology  
. . . space psychology  
. . . . anesthesiology  
. . . . cardiology  
. . . . clinical medicine  
. . . . dentistry  
. . . . dermatology  
. . . . endocrinology  
. . . . epidemiology  
. . . . geriatrics  
. . . . gynecology  
. . . . histology  
. . . . immunology  
. . . . neurology  
. . . . nuclear medicine  
. . . . radiobiology  
. . . . ophthalmology  
. . . . orthopedics  
. . . . otolaryngology  
. . . . otology  
. . . . pathology  
. . . . human pathology  
. . . . pharmacology  
. . . . psychopharmacology  
. . . . psychiatry  
. . . . neuropsychiatry  
. . . . social psychiatry  
. . . . radiology  
. . . . radiopathology  
. . . . sports medicine  
. . . . surgery  
. . . . labyrinthectomy  
. . . . symptomatology  
. . . . urology  
. . . . veterinary medicine

- RT ∞ biology  
diagnosis  
diseases  
first aid  
∞ medicine  
optometry  
pneumothorax  
psychopharmacology  
radiation therapy  
∞ science  
telemedicine  
transfusion

## medical services

- GS services  
. **medical services**
- RT ambulances  
first aid  
intravenous procedures  
mobile quarantine facility  
public health  
telemedicine

## ∞ medicine

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aerospace medicine  
clinical medicine  
drugs  
medical equipment  
medical personnel  
medical science  
neuropsychiatry  
pharmacology  
psychopharmacology  
radiobiology  
radiology  
veterinary medicine

## Mediterranean Sea

- GS seas  
. **Mediterranean Sea**  
. . . Adriatic Sea
- RT Cyprus  
Gibraltar  
Malta  
Rhône Delta (France)

Sicily

## medium scale integration

- GS circuits  
. integrated circuits  
. . . **medium scale integration**  
microelectronics  
. **medium scale integration**
- RT electronic packaging  
large scale integration  
molecular electronics  
printed circuits

## meetings

USE **conferences**

## megalopolises

- RT cities  
communities  
demography  
industrial areas  
regional planning  
residential areas  
rural areas  
suburban areas  
urban development  
urban transportation

## megamechanics

- RT large space structures  
mechanics (physics)  
structural analysis  
structural engineering  
trusses

## Meissner effect

USE **diamagnetism**  
**superconductivity**

## meitnerium

- (added May 1998)
- GS chemical elements  
. **meitnerium**
- RT hassium

## melamine

- GS organic compounds  
. amines  
. . . **melamine**
- RT resins

## melanin

- GS biopolymers  
. proteins  
. . . **melanin**  
organic compounds  
. proteins  
. . . **melanin**  
pigments  
. **melanin**
- RT dopa  
skin (anatomy)

## melanoidin

- GS acids  
. amino acids  
. . . **melanoidin**  
organic compounds  
. amino acids  
. . . **melanoidin**

## melatonin

- (added August 2004)
- DEF A biogenic amine that is found in animals and plants. In mammals, melatonin is produced by the pineal gland. Its secretion increases in darkness and decreases during exposure to light. Melatonin is implicated in the regulation of sleep, mood, and reproduction. Melatonin is also an effective antioxidant.

- GS organic compounds  
. amines  
. . . tryptamines  
. . . . **melatonin**  
. . . cyclic compounds  
. . . heterocyclic compounds  
. . . . indoles  
. . . . . tryptamines  
. . . . . **melatonin**
- RT antioxidants

hormones  
moods  
photoperiod  
pineal gland  
secretions  
sleep

**Mellin transforms**

GS functions (mathematics)  
. **Mellin transforms**  
RT integral equations  
kernel functions

**melt spinning**

DEF A material process by which polymers such as nylon and polyesters and glass are melted to permit extrusion into fibers through spinnerets.

GS crystallization  
. **melt spinning**  
melts (crystal growth)  
. **melt spinning**  
solidification  
. **melt spinning**  
RT ∞ metallurgy  
phase transformations

**melting**

UF *remelting*  
*thawing*  
GS phase transformations  
. **melting**  
. . arc melting  
. . fusion (melting)  
. . levitation melting  
. . vacuum melting  
. . zone melting  
RT ablation  
aufeis (ice)  
burnthrough (failure)  
casting  
coal liquefaction  
containerless melts  
cooling  
defrosting  
deicing  
drop transfer  
extraction  
freezing  
furnaces  
heat of fusion  
heating  
ice prevention  
impact melts  
induction heating  
injection molding  
liquefaction  
liquid metals  
liquid-solid interfaces  
melts (crystal growth)  
metal cutting  
metal foams  
∞ metallurgy  
molds  
phase change materials  
pseudopotentials  
∞ separation  
smelting  
solar furnaces  
spiking

**melting points**

DEF liquidus and solidus coincide at an invariant point. In a phase diagram, the temperature at which the

UF *freezing points*  
GS thermodynamic properties  
. thermophysical properties  
. . **melting points**  
RT high temperature tests  
liquid phases  
liquidus  
low temperature tests  
phase diagrams  
reaction bonding  
solid solutions  
solid state  
solidification  
solidified gases  
specific heat

temperature  
transition temperature

**melts (crystal growth)**

DEF Molten substances from which crystals are formed during the cooling or solidifying process.

GS **melts (crystal growth)**  
. containerless melts  
. impact melts  
. melt spinning  
RT atomic structure  
crystal growth  
crystallization  
float zones  
Marangoni convection  
melting  
semiconductors (materials)

*MEM (excursion module)*

USE **Mars Excursion Module**

**membership functions**

*(added December 2000)*  
DEF Characteristic functions of a fuzzy set, which assign a value indicating the degree of membership for each element in a universal set.

GS functions (mathematics)  
. **membership functions**  
RT control systems design  
fuzzy sets  
fuzzy systems  
machine learning  
neural nets

*membrane analogy*

USE **membrane structures**  
**structural analysis**

**membrane structures**

DEF Shell structures, often pressurized, that do not take wall bending or compression loads. Used for membrane analogy.

UF *membrane analogy*  
GS membranes  
. **membrane structures**  
. . skin (structural member)  
structural members  
. **membrane structures**  
. . skin (structural member)  
RT diaphragms (mechanics)  
metal shells  
perforated shells  
Scotchlite (trademark)  
∞ sheets  
shells (structural forms)  
∞ structures  
thin walled shells  
webs (supports)

*membrane theory*

USE **structural analysis**

**membranes**

UF *webs (membranes)*  
GS **membranes**  
. cell membranes (biology)  
. choroid membranes  
. conjunctiva  
. epicardium  
. ion exchange membrane electrolytes  
. membrane structures  
. . skin (structural member)  
. peritoneum  
. pleurae  
RT biofilms  
∞ diaphragms  
diaphragms (mechanics)  
∞ films  
jet membrane process  
∞ layers  
osmosis  
reverse osmosis  
septum  
∞ sheets  
shells (structural forms)  
skin (anatomy)  
∞ webs  
webs (sheets)

webs (supports)

**memory**

SN (LIMITED TO SENTIENT ORGANISMS—EXCLUDES COMPUTER STORAGE DEVICES AND PLASTIC MEMORY)  
RT education  
learning  
mnemonics  
recognition  
retention (psychology)

**memory (computers)**

DEF The component of a computer, control system, guidance system, instrumented satellite, or the like, designed to provide ready access to data or instructions previously recorded so as to make them bear upon an immediate problem, such as the guidance of a physical object, or the analysis and reduction of data.

GS **memory (computers)**  
. random access memory  
. . carbon nanotube based memory  
. . core storage  
. associative memory  
. distributed memory  
. optical memory (data storage)  
RT architecture (computers)  
chips (memory devices)  
computer design  
computer storage devices  
computers  
hole burning  
magnetic disks  
video disks

*MEMS (electromechanical devices)*

*(added October 1998)*  
USE **microelectromechanical systems**

**mendelevium**

GS chemical elements  
. actinide series  
. . transuranium elements  
. . . **mendelevium**  
. . nuclides  
. . isotopes  
. . . radioactive isotopes  
. . . . transuranium elements  
. . . . **mendelevium**  
metals  
. actinide series  
. . transuranium elements  
. . . **mendelevium**

**meningitis**

GS diseases  
. infectious diseases  
. . **meningitis**  
RT acquired immunodeficiency syndrome  
bacterial diseases  
viral diseases

**menisci**

GS liquid surfaces  
. **menisci**  
RT Bond number  
curves (geometry)  
liquid-gas mixtures  
liquid-solid interfaces  
liquid-vapor interfaces  
∞ surfaces

**menstruation**

RT females  
ovaries  
physiology

**mental health**

GS health  
. **mental health**  
RT human performance  
intelligence  
neuropsychiatry  
psychotherapy  
Rorschach tests  
schizophrenia

**mental performance**

RT abilities

## menthol

- cognitive psychology
- consciousness
- human performance
- hypernea
- inspiration
- intellect
- intelligence
- intelligence tests
- irrationality
- lies
- operator performance
- ∞ performance
- psychomotor performance
- stress (psychology)
- workloads (psychophysiology)

*mental stress*

USE **stress (psychology)**

## menthol

GS organic compounds

- . cyclic compounds
- . . cyclic hydrocarbons
- . . . **menthol**
- . hydrocarbons
- . . cyclic hydrocarbons
- . . . **menthol**
- terpenes
- . **menthol**

## meprobamate

GS esters

- . **meprobamate**

*mercaptan*

USE **thiols**

*mercapto compounds*

USE **thiols**

## Mercator projection

DEF An equatorial, cylindrical, conformal map projection derived by mathematical analysis (not geometrically) in which the equator is represented by a straight line true to scale. The meridians are represented by parallel straight lines perpendicular to the equator and equally spaced according to their distance apart at the equator. The parallels are represented by straight lines perpendicular to the meridians and parallel with (and the same length as) the equator. The parallels are spaced so as to achieve conformality, their spacing increasing rapidly with their distance from the equator so that at all places the degrees of latitude and longitude have the same ratio to each other as to the sphere itself. This results in greater distortion of distances, areas, and shapes in the polar regions (above 80 deg. latitude). The scale is increasingly poleward as the secant of the latitude. Because any line of constant direction (azimuth) on the sphere is truly represented on the projection by a straight line, the Mercator projection is of great value in navigation. It is used for hydrographic charts, and also to show geographic variations of some physical property (such as magnetic declination) or to plot trajectories of Earth satellites in oblique orbits. It is named after Gerhardus Mercator (1512-1594), a Flemish mathematician and geographer, whose world map of 1569 used this projection.

GS geometry

- . Euclidean geometry
- . . analytic geometry
- . . . **Mercator projection**
- . . projective geometry
- . . . **Mercator projection**

RT maps

## Mercure aircraft

GS transport aircraft

- . short haul aircraft
- . . **Mercure aircraft**

RT ∞ aircraft

- cargo aircraft
- passenger aircraft

## mercury (metal)

UF *liquid mercury*

GS chemical elements

. **mercury (metal)**

- . . mercury isotopes
- . . mercury vapor
- liquids
- . liquid metals
- . . **mercury (metal)**
- . . . mercury isotopes
- . . . mercury vapor
- metals
- . liquid metals
- . . **mercury (metal)**
- . . . mercury isotopes
- . . . mercury vapor
- transition metals
- . . **mercury (metal)**
- . . . mercury isotopes
- . . . mercury vapor

RT heavy metals

## Mercury (planet)

GS celestial bodies

- . planets
- . . terrestrial planets
- . . . **Mercury (planet)**

RT Mercury atmosphere

Mercury surface

MESSENGER (spacecraft)

planetary craters

## mercury alloys

GS alloys

- . **mercury alloys**
- . . mercury amalgams

## mercury amalgams

UF *amalgams*

GS alloys

- . mercury alloys
- . . **mercury amalgams**

## mercury arcs

GS electric current

- . electric discharges
- . . electric arcs
- . . . **mercury arcs**

RT arc lamps

metallic plasmas

rectifiers

## Mercury atmosphere

GS environments

- . extraterrestrial environments
- . . planetary environments
- . . . planetary atmospheres
- . . . . **Mercury atmosphere**

RT Mercury (planet)

Mercury surface

planetary meteorology

## mercury cadmium tellurides

DEF Compounds of tellurium exhibiting photovoltaic characteristics and used for photodiodes and photodetectors in the 3 to 12 micrometer wavelengths at cryogenic temperatures. Used for cadmium mercury tellurides.

UF *cadmium mercury tellurides*

GS chalcogenides

- . tellurides
- . . mercury tellurides
- . . . **mercury cadmium tellurides**

mercury compounds

- . mercury tellurides
- . . **mercury cadmium tellurides**
- tellurium compounds
- . tellurides
- . . mercury tellurides
- . . . **mercury cadmium tellurides**

RT infrared detectors

photoconductivity

photoconductors

photodiodes

## mercury compounds

GS **mercury compounds**

- . mercury oxides
- . mercury tellurides
- . . mercury cadmium tellurides

RT ∞ chemical compounds

- ∞ Group 2B compounds

∞ metal compounds

## Mercury flights

GS space flight

- . manned space flight
- . . **Mercury flights**
- . . . Mercury MA-1 flight
- . . . Mercury MA-2 flight
- . . . Mercury MA-3 flight
- . . . Mercury MA-4 flight
- . . . Mercury MA-5 flight
- . . . Mercury MA-6 flight
- . . . Mercury MA-7 flight
- . . . Mercury MA-8 flight
- . . . Mercury MA-9 flight
- . . . Mercury MR-1 flight
- . . . Mercury MR-2 flight
- . . . Mercury MR-3 flight
- . . . Mercury MR-4 flight

RT Atlas launch vehicles

manned spacecraft

space capsules

## mercury ion engines

DEF Machines providing thrust by expelling accelerated or high velocity mercury ions and often using energy provided by nuclear reactors.

GS engines

- . rocket engines
- . . electric rocket engines
- . . . electrostatic engines
- . . . . ion engines
- . . . . . **mercury ion engines**

RT nuclear propulsion

nuclear rocket engines

plasma engines

## mercury isotopes

GS chemical elements

- . mercury (metal)
- . . **mercury isotopes**
- . . nuclides
- . . isotopes
- . . . **mercury isotopes**

liquids

- . liquid metals
- . . mercury (metal)
- . . . **mercury isotopes**

metals

- . liquid metals
- . . mercury (metal)
- . . . **mercury isotopes**
- . transition metals
- . . mercury (metal)
- . . . **mercury isotopes**

## mercury lamps

GS lighting equipment

- . luminaires
- . . **mercury lamps**

RT light sources

phosphors

sterilization

xenon lamps

## Mercury MA-1 flight

GS space flight

- . manned space flight
- . . Mercury flights
- . . . **Mercury MA-1 flight**

RT Atlas launch vehicles

## Mercury MA-2 flight

UF *MA-2 mission*

GS space flight

- . manned space flight
- . . Mercury flights
- . . . **Mercury MA-2 flight**

RT Atlas launch vehicles

Faith 7

## Mercury MA-3 flight

UF *MA-3 flight*

GS space flight

- . manned space flight
- . . Mercury flights
- . . . **Mercury MA-3 flight**

RT Atlas launch vehicles

**Mercury MA-4 flight**  
 UF *MA-4 flight*  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-4 flight**  
 RT Atlas launch vehicles

**Mercury MA-5 flight**  
 UF *MA-5 flight*  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-5 flight**  
 RT Atlas launch vehicles

**Mercury MA-6 flight**  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-6 flight**  
 RT Atlas launch vehicles  
 Friendship 7

**Mercury MA-7 flight**  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-7 flight**  
 RT Atlas launch vehicles  
 Aurora 7

**Mercury MA-8 flight**  
 UF *MA-8 flight*  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-8 flight**  
 RT Atlas launch vehicles  
 SIGMA 7

**Mercury MA-9 flight**  
 UF *MA-9 flight*  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MA-9 flight**  
 RT Atlas launch vehicles  
 Faith 7

**Mercury MR-1 flight**  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MR-1 flight**

**Mercury MR-2 flight**  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MR-2 flight**

**Mercury MR-3 flight**  
 UF *MR-3 flight*  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MR-3 flight**

**Mercury MR-4 flight**  
 GS space flight  
 . manned space flight  
 . . Mercury flights  
 . . . **Mercury MR-4 flight**

**mercury oxides**  
 GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . **mercury oxides**  
 mercury compounds  
 . **mercury oxides**

**Mercury project**  
 GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Mercury project**  
 . projects

. . **Mercury project**  
 . space programs  
 . . NASA space programs  
 . . . **Mercury project**

RT Apollo project  
 Atlas launch vehicles  
 Gemini project  
 Little Joe 2 launch vehicle  
 manned space flight  
 manned spacecraft

**Mercury spacecraft**  
 GS manned spacecraft  
 . **Mercury spacecraft**  
 . . Aurora 7  
 . . Faith 7  
 . . Friendship 7  
 . . SIGMA 7  
 reentry vehicles  
 . recoverable spacecraft  
 . **Mercury spacecraft**  
 . . . Aurora 7  
 . . . Faith 7  
 . . . Friendship 7  
 . . . SIGMA 7  
 soft landing spacecraft  
 . **Mercury spacecraft**  
 . . Aurora 7  
 . . Faith 7  
 . . Friendship 7  
 . . SIGMA 7  
 space capsules  
 . **Mercury spacecraft**  
 . . Aurora 7  
 . . Faith 7  
 . . Friendship 7  
 . . SIGMA 7

**Mercury surface**  
 DEF The surface of the planet Mercury.  
 GS planetary surfaces  
 . **Mercury surface**  
 RT extraterrestrial environments  
 Mercury (planet)  
 Mercury atmosphere  
 MESSENGER (spacecraft)  
 planetary craters  
 satellite surfaces  
 solar system  
 terrestrial planets

**mercury tellurides**  
 GS chalcogenides  
 . tellurides  
 . . **mercury tellurides**  
 . . . mercury cadmium tellurides  
 mercury compounds  
 . **mercury tellurides**  
 . . mercury cadmium tellurides  
 tellurium compounds  
 . tellurides  
 . . **mercury tellurides**  
 . . . mercury cadmium tellurides

**mercury vapor**  
 GS chemical elements  
 . mercury (metal)  
 . . **mercury vapor**  
 liquids  
 . liquid metals  
 . . mercury (metal)  
 . . . **mercury vapor**  
 metals  
 . liquid metals  
 . . mercury (metal)  
 . . . **mercury vapor**  
 . metal vapors  
 . . **mercury vapor**  
 . transition metals  
 . . mercury (metal)  
 . . . **mercury vapor**  
 vapors  
 . metal vapors  
 . . **mercury vapor**  
 RT cesium vapor  
 sodium vapor

**merging routines**  
 GS computer programs  
 . **merging routines**

RT ∞ routines

**meridional flow**  
 GS fluid flow  
 . gas flow  
 . . air flow  
 . . . air currents  
 . . . . **meridional flow**  
 RT atmospheric circulation  
 flow geometry  
 wind (meteorology)  
 wind direction  
 zonal flow (meteorology)

*Merlin (helicopter)*  
 (added April 1997)  
 USE **EH-101 helicopter**

**meromorphic functions**  
 GS analysis (mathematics)  
 . complex variables  
 . . **meromorphic functions**  
 . . . elliptic functions  
 . . . rational functions  
 functions (mathematics)  
 . **meromorphic functions**  
 . . elliptic functions  
 . . rational functions

**Merritt Island (FL)**  
 GS landforms  
 . islands  
 . . **Merritt Island (FL)**  
 RT Florida

**merwinite**  
 GS calcium compounds  
 . **merwinite**  
 magnesium compounds  
 . **merwinite**  
 minerals  
 . **merwinite**  
 silicon compounds  
 . silicates  
 . . **merwinite**

**mesas**  
 DEF Isolated, nearly level landmasses standing distinctly above the surrounding country, bounded by abrupt or steeply sloping erosion scarps on all sides, and capped by layers of resistant, nearly horizontal rock (often lava). Less strictly, very broad, flat topped, usually isolated hills or mountains of moderate height bounded on at least one side by a steep cliff or slope and representing an erosion remnant. Mesas are similar to, but have more summit area than buttes and are common topographical features in arid and semiarid regions of the United States. Mesas are often considered broad terraces or comparatively flat plateaus along river valleys. They are marked by an abrupt slope or escarpment on one side.  
 GS landforms  
 . terraces (landforms)  
 . . plateaus  
 . . . **mesas**  
 . . . . buttes  
 RT flats (landforms)  
 highlands  
 mountains

*MESFETs*  
 USE **field effect transistors**

**mesh**  
 RT fabrics  
 ∞ grids  
 strands  
 webbing



## meshfree methods

∞ webs

*mesh (mathematics)*

USE **computational grids**

*mesh generation (mathematics)*

USE **grid generation (mathematics)**

*mesh refinement (mathematics)*

(added August 2003)

USE **grid refinement (mathematics)**

### meshfree methods

(added April 2008)

DEF Computational techniques that provide numerical solutions by using a set of arbitrarily distributed nodes (discretization points) and weight functions without the use of mesh or grid information in their formulations.

UF *gridfree methods*

*meshless methods*

GS analysis (mathematics)

. numerical analysis

. . approximation

. . . **meshfree methods**

RT computational electromagnetics

computational fluid dynamics

computational mechanics

finite element method

Galerkin method

integral equations

kernel functions

magnetohydrodynamic simulation

partial differential equations

particle in cell technique

plasma dynamics

solid mechanics

weighting functions

*meshless methods*

(added May 2008)

USE **meshfree methods**

### mesitylene

GS organic compounds

. hydrocarbons

. . **mesitylene**

### mesometeorology

GS meteorology

. **mesometeorology**

RT aeronomy

lower atmosphere

micrometeorology

### meson resonance

GS particles

. elementary particles

. . bosons

. . . mesons

. . . . **meson resonance**

. . . . . X mesons

. . fermions

. . . **meson resonance**

. . . . X mesons

. . hadrons

. . . mesons

. . . . **meson resonance**

. . . . . X mesons

. . nuclear particles

. . bosons

. . . mesons

. . . . **meson resonance**

. . . . . X mesons

resonance

. **meson resonance**

. . X mesons

RT baryons

hyperons

### meson-meson interactions

GS particle interactions

. elementary particle interactions

. . **meson-meson interactions**

RT electromagnetic interactions

∞ interactions

### meson-nucleon interactions

GS particle interactions

. elementary particle interactions

. . **meson-nucleon interactions**

RT charged particles

∞ interactions

mesons

Yukawa potential

### mesons

DEF In the classification of subatomic particles by mass, the second lightest of such particles. Their mass is intermediate between that of the lepton and the nucleon.

GS particles

. elementary particles

. . bosons

. . . **mesons**

. . . . eta-mesons

. . . . hyperons

. . . . . xi hyperons

. . . . kaons

. . . . meson resonance

. . . . . X mesons

. . . . muons

. . . . omega-mesons

. . . . pions

. . . . vector mesons

. . . . . rho-mesons

. . . . . sigma-mesons

. . hadrons

. . . **mesons**

. . . . eta-mesons

. . . . hyperons

. . . . . xi hyperons

. . . . kaons

. . . . meson resonance

. . . . . X mesons

. . . . muons

. . . . omega-mesons

. . . . pions

. . . . vector mesons

. . . . . rho-mesons

. . . . . sigma-mesons

. nuclear particles

. . bosons

. . . **mesons**

. . . . eta-mesons

. . . . hyperons

. . . . . xi hyperons

. . . . kaons

. . . . meson resonance

. . . . . X mesons

. . . . muons

. . . . omega-mesons

. . . . pions

. . . . vector mesons

. . . . . rho-mesons

. . . . . sigma-mesons

RT baryons

boson fields

charged particles

corpuscular radiation

cosmic rays

gluons

leptons

meson-nucleon interactions

muonium

Pomeranchuk theorem

strangeness

### mesopause

SN (ALTITUDE APPROXIMATELY 90 KM)

DEF The base of the inversion at the top of the mesosphere, usually found at 80 to 85 kilometers.

GS Earth atmosphere

. middle atmosphere

. . mesosphere

. . . **mesopause**

RT stratopause

### mesophiles

RT microorganisms

psychrophiles

thermophiles

### mesoscale phenomena

DEF Meteorological phenomena extending approximately one to a hundred kilometers (mesoscale cloud patterns, for example).

GS **mesoscale phenomena**

. jet streams (meteorology)

RT arc clouds

meteorology

phenomenology

wind (meteorology)

### mesosphere

SN (ALTITUDE RANGE BETWEEN APPROXIMATELY 45 AND 90 KM)

DEF The atmospheric shell, in which temperature generally decreases with heights, extending from the stratopause at about 50 to 55 kilometers to the mesopause at about 80 to 85 kilometers.

GS Earth atmosphere

. middle atmosphere

. . **mesosphere**

. . . mesopause

RT chemosphere

Earth ionosphere

homosphere

Solar Mesosphere Explorer

stratopause

### Mesozoic Era

(added June 1989)

DEF An era of geologic time, from the end of the Paleozoic Era to the beginning of the Cenozoic Era, or from about 225 to about 65 million years ago.

GS **Mesozoic Era**

. Cretaceous Period

RT Cretaceous-Tertiary boundary

geochronology

paleontology

Paleozoic Era

### message processing

DEF In communication operations, the acceptance, preparation for transmission, receipt and/or delivery of a series of words or symbols intended for conveying information.

RT automatic repeat request

communicating

communication

cryptography

information flow

messages

packet transmission

∞ processing

semantics

signal processing

signal transmission

symbols

### messages

GS communicating

. information dissemination

. . **messages**

RT automatic repeat request

communication theory

information theory

intelligibility

message processing

semantics

sentences

signal transmission

∞ signals

syllables

symbols

vocoders

words (language)

### MESSENGER (spacecraft)

(added October 2004)

DEF Spacecraft and related mission designed to study the structure, geochemistry, and magnetic fields of the planet Mercury. The science payload consists of the Mercury Dual Imaging System (MDIS), the Gamma-Ray and Neutron Spectrometer, the Mercury Laser Altimeter, the Mercury Atmospheric and Surface Composition Spectrometer, the Energetic Particle and Plasma Spectrometer, and a magnetometer, radio science instrument, and x-ray spectrometer. MESSENGER (MErcury Surface, Space ENvironment, Geochemistry, and Ranging) was launched August 2004.

GS interplanetary spacecraft

. **MESSENGER (spacecraft)**

unmanned spacecraft

. space probes  
 . . **MESSENGER (spacecraft)**  
 RT Mercury (planet)  
 Mercury surface  
 planetary geology  
 planetary magnetic fields  
 space exploration  
 space missions

*messenger RNA*  
 USE **ribonucleic acids**

*Messerschmitt ME P-160 aircraft*  
 USE **P-160 aircraft**

*Messerschmitt ME P-308 aircraft*  
 USE **P-308 aircraft**

**metabolic diseases**  
 GS diseases  
 . **metabolic diseases**  
 RT metabolism

**metabolic wastes**  
 GS wastes  
 . **metabolic wastes**  
 . . human wastes  
 . . . feces  
 . . . urine  
 RT activated sludge  
 air pollution  
 carbon dioxide  
 composting  
 environment effects  
 environment pollution  
 environmental surveys  
 expired air  
 liquid wastes  
 manures  
 metabolites  
 organic wastes (fuel conversion)  
 pollution  
 sewage  
 sewers  
 solid wastes  
 waste disposal

**metabolism**  
 DEF The sum of all physical and chemical processes by which living organized substance is produced and maintained and by which energy is made available for the use of the organism.  
 GS **metabolism**  
 . adrenal metabolism  
 . ascorbic acid metabolism  
 . calcium metabolism  
 . carbohydrate metabolism  
 . . hyperglycemia  
 . . hypoglycemia  
 . catabolism  
 . electrolyte metabolism  
 . enzyme activity  
 . . fermentation  
 . hormone metabolisms  
 . hydrogen metabolism  
 . hypometabolism  
 . mineral metabolism  
 . nitrogen metabolism  
 . oxygen metabolism  
 . phosphorus metabolism  
 . protein metabolism  
 . . lipid metabolism  
 RT adenosine monophosphate  
 caloric requirements  
 enzymology  
 heterotrophs  
 homeostasis  
 Krebs cycle  
 metabolic diseases  
 metabolites  
 nutrition  
 obesity  
 osteoporosis  
 oxygen consumption  
 physiology  
 respiration  
 secretions  
 thermoregulation

vasopressins

**metabolites**  
 DEF Products of biological synthesis and/or metabolism.  
 RT biochemistry  
 biosynthesis  
 metabolic wastes  
 metabolism  
 organic compounds

*metacomputing*  
 (added December 2003)  
 USE **grid computing (computer networks)**

**metadata**  
 (added June 2004)  
 DEF Data that provides information about other data. Structured information describing any object or resource.  
 GS information  
 . **metadata**  
 RT ∞ data  
 data bases  
 data management  
 indexing (information science)  
 information retrieval

*metagalaxy*  
 USE **universe**

**metal air batteries**  
 GS electric generators  
 . direct power generators  
 . . primary batteries  
 . . . **metal air batteries**  
 . . . . zinc-oxygen batteries  
 electrochemical cells  
 . electric batteries  
 . . primary batteries  
 . . . **metal air batteries**  
 . . . . zinc-oxygen batteries  
 RT dry cells  
 storage batteries

**metal bonding**  
 GS bonding  
 . **metal bonding**  
 . . metal-metal bonding  
 RT adhesion  
 adhesive bonding  
 bimetals  
 brazing  
 diffusion welding  
 explosive welding  
 heat affected zone  
 joints (junctions)  
 laminates  
 resin bonding  
 soldering  
 welding

**metal clusters**  
 (added January 1994)  
 DEF Bonded aggregations of like metal atoms.  
 RT agglomeration  
 atomic clusters  
 chemisorption  
 clumps  
 ∞ clusters  
 metals  
 molecular clusters  
 nanoclusters  
 nucleation

**metal coatings**  
 SN (COATINGS CONSISTING OF METAL)  
 GS coatings  
 . **metal coatings**  
 . . aluminum coatings  
 . . gold coatings  
 . . nickel coatings  
 . . zinc coatings  
 RT anodic stripping  
 antiradar coatings  
 ceramic coatings  
 cladding  
 corrosion

corrosion prevention  
 deposition  
 electroless deposition  
 hot corrosion  
 ion plating  
 lacquers  
 magnetron sputtering  
 metallizing  
 ∞ metallurgy  
 metals  
 optical coatings  
 oxides  
 paints  
 ∞ plates  
 plating  
 primers (coatings)  
 protective coatings  
 sprayed coatings

**metal combustion**  
 GS combustion  
 . **metal combustion**  
 RT fuel combustion  
 gas-metal interactions  
 metals  
 oxidation  
 propellant combustion  
 pyrophoric materials  
 solid propellant combustion  
 solid propellant ignition

∞ **metal compounds**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT ∞ alkali metal compounds  
 aluminum compounds  
 amines  
 antimony compounds  
 barium compounds  
 beryllium compounds  
 bismuth compounds  
 cadmium compounds  
 calcium compounds  
 cerium compounds  
 cesium compounds  
 ∞ chemical compounds  
 chromium compounds  
 cobalt compounds  
 copper compounds  
 dysprosium compounds  
 erbium compounds  
 europium compounds  
 gallium compounds  
 germanium compounds  
 hafnium compounds  
 indium compounds  
 iridium compounds  
 iron compounds  
 lanthanum compounds  
 lead compounds  
 lead organic compounds  
 lithium compounds  
 lithium iodates  
 lutetium compounds  
 magnesium compounds  
 manganese compounds  
 mercury compounds  
 metal fluorides  
 metal halides  
 metal hydrides  
 metal oxides  
 metals  
 molybdenum compounds  
 neodymium compounds  
 neptunium compounds  
 nickel compounds  
 niobium compounds  
 organic aluminum compounds  
 organic germanium compounds  
 organic lithium compounds  
 organic tin compounds  
 organometallic compounds  
 osmium compounds  
 platinum compounds  
 plutonium compounds  
 potassium compounds  
 praseodymium compounds  
 protactinium compounds  
 rare earth compounds

## metal crystals

refractory materials  
rhenium compounds  
rubidium compounds  
ruthenium compounds  
samarium compounds  
scandium compounds  
silver compounds  
sodium compounds  
strontium compounds  
strontium oxides  
tantalum compounds  
technetium compounds  
thallium compounds  
thorium compounds  
thulium compounds  
tin compounds  
titanium compounds  
tungsten compounds  
uranium compounds  
vanadium compounds  
vanadyl compounds  
ytterbium compounds  
yttrium compounds  
zinc compounds  
zirconium compounds

*metal corrosion*

USE **corrosion**

### metal crystals

GS crystals  
. **metal crystals**  
RT crystal lattices  
crystal structure  
metallography  
metals

### metal cutting

GS cutting  
. **metal cutting**  
RT countersinking  
grinding (material removal)  
knurling  
laser cutting  
machine tools  
machining  
melting  
micromachining  
milling (machining)  
perforating  
planing  
plasma arc cutting  
scarfing  
shearing  
slicing  
spark machining  
spiking

### metal drawing

GS forming techniques  
. **metal drawing**  
metal working  
. **metal drawing**  
RT bulging  
bundle drawing  
cold drawing  
cold working  
∞ drawing  
ductility  
hot working  
magnetic forming  
stretch forming

### metal fatigue

GS fatigue (materials)  
. **metal fatigue**  
RT bending fatigue  
Coffin-Manson law  
crack closure  
crack initiation  
crack propagation  
fracturing  
grain size  
inelastic stress  
retirement for cause  
rupturing  
Segre characteristic  
short cracks  
S-N diagrams  
stress corrosion

stress corrosion cracking  
thermal fatigue  
transgranular corrosion

### metal fibers

GS fibers  
. **metal fibers**  
RT Borsic (tradename)  
fiber composites  
filament winding  
reinforcing fibers

### metal films

RT coatings  
diamond films  
∞ films  
metallizing  
metals  
nickel coatings  
pickling (metallurgy)  
sputtering gages  
thin films

### metal finishing

GS **metal finishing**  
. electropolishing  
. peening  
. shot peening  
RT cleaning  
coating  
coatings  
descaling  
pickling (metallurgy)  
plating  
surface finishing

### metal fluorides

GS halogen compounds  
. fluorine compounds  
. . . fluorides  
. . . **metal fluorides**  
. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides  
. . . . protactinium fluorides  
. . . . sodium fluorides  
. . . . strontium fluorides  
. . . . thorium fluorides  
. . . . tungsten fluorides  
. . . . uranium fluorides  
. . . . zinc fluorides  
. . . . zirconium fluorides  
. halides  
. . fluorides  
. . . **metal fluorides**  
. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides  
. . . . protactinium fluorides  
. . . . sodium fluorides  
. . . . strontium fluorides  
. . . . thorium fluorides  
. . . . tungsten fluorides  
. . . . uranium fluorides  
. . . . zinc fluorides  
. . . . zirconium fluorides  
. . metal halides  
. . . **metal fluorides**

. . . . aluminum fluorides  
. . . . beryllium fluorides  
. . . . cadmium fluorides  
. . . . calcium fluorides  
. . . . . fluorspar  
. . . . cesium fluorides  
. . . . chromium fluorides  
. . . . cobalt fluorides  
. . . . copper fluorides  
. . . . lanthanum fluorides  
. . . . lithium fluorides  
. . . . magnesium fluorides  
. . . . nickel fluorides  
. . . . plutonium fluorides  
. . . . protactinium fluorides  
. . . . sodium fluorides  
. . . . strontium fluorides  
. . . . thorium fluorides  
. . . . tungsten fluorides  
. . . . uranium fluorides  
. . . . zinc fluorides  
. . . . zirconium fluorides  
RT ∞ metal compounds

### metal foams

DEF Foamed materials formed under low gravity conditions in space from sputtered metal deposits. This experimental space processing was completed in the second NASA SPAR flight.

GS foams

. **metal foams**  
RT bubbles  
foaming  
low gravity manufacturing  
∞ materials science  
melting  
∞ metallurgy  
Space Processing Applications  
Rocket

### metal foils

GS foils (materials)  
. **metal foils**  
RT honeycomb structures  
metals  
multilayer insulation  
∞ sheets

*metal forging*

USE **forging**

*metal forming*

USE **forming techniques**  
**metal working**

### metal fuels

GS fuels  
. chemical fuels  
. . **metal fuels**  
RT aluminum compounds  
beryllium compounds  
boron compounds  
cesium compounds  
gelled propellants  
hybrid propellants  
lithium compounds  
metals  
slurry propellants  
solid propellants

### metal grinding

GS grinding (material removal)  
. **metal grinding**  
RT forming techniques  
grinding machines  
surface finishing

### metal halides

GS halogen compounds  
. halides  
. . **metal halides**  
. . . alkali halides  
. . . . cesium halides  
. . . . . cesium bromides  
. . . . . cesium fluorides  
. . . . . cesium iodides  
. . . . . potassium iodides  
. . . . sodium bromides  
. . . . sodium chlorides  
. . . . sodium fluorides

- . . . . sodium iodides
- . . . . aluminum chlorides
- . . . . barium fluorides
- . . . . beryllium chlorides
- . . . . cadmium chlorides
- . . . . calcium chlorides
- . . . . chromium bromides
- . . . . copper chlorides
- . . . . hafnium iodides
- . . . . iron chlorides
- . . . . lanthanum chlorides
- . . . . lead chlorides
- . . . . lithium chlorides
- . . . . magnesium bromides
- . . . . metal fluorides
- . . . . . aluminum fluorides
- . . . . . beryllium fluorides
- . . . . . cadmium fluorides
- . . . . . calcium fluorides
- . . . . . fluorspar
- . . . . . cesium fluorides
- . . . . . chromium fluorides
- . . . . . cobalt fluorides
- . . . . . copper fluorides
- . . . . . lanthanum fluorides
- . . . . . lithium fluorides
- . . . . . magnesium fluorides
- . . . . . nickel fluorides
- . . . . . plutonium fluorides
- . . . . . protactinium fluorides
- . . . . . sodium fluorides
- . . . . . strontium fluorides
- . . . . . thorium fluorides
- . . . . . tungsten fluorides
- . . . . . uranium fluorides
- . . . . . zinc fluorides
- . . . . . zirconium fluorides
- . . . . niobium iodides
- . . . . potassium bromides
- . . . . potassium chlorides
- . . . . silver halides
- . . . . silver bromides
- . . . . silver chlorides
- . . . . silver iodides
- . . . . strontium bromides
- . . . . technetium fluorides
- . . . . titanium chlorides
- . . . . tungsten halides
- . . . . tungsten chlorides
- . . . . tungsten fluorides
- . . . . zinc chlorides
- . . . . zirconium iodides
- RT ∞ metal compounds

*metal hardening*

USE **hardening (materials)**

**metal hydrides**

- UF *plumbane*
- GS hydrogen compounds
- . hydrides
- . . **metal hydrides**
- . . . . aluminum hydrides
- . . . . aluminum borohydrides
- . . . . beryllium hydrides
- . . . . cesium hydrides
- . . . . lithium hydrides
- . . . . lithium aluminum hydrides
- . . . . potassium hydrides
- . . . . sodium hydrides
- RT ∞ metal compounds

*metal insulator semiconductors*

USE **MIS (semiconductors)**

**metal ions**

- GS ions
- . **metal ions**
- . . ferric ions
- . . manganese ions
- RT barium ion clouds
- cations
- crystal field theory
- ion implantation
- ion plating
- metals
- positive ions

**metal joints**

- GS joints (junctions)

. **metal joints**

- . . soldered joints
- . . welded joints
- . . . spot welds
- RT butt joints
- explosive welding
- lap joints
- riveted joints
- scarf joints
- seams (joints)

**metal matrix composites**

- GS composite materials
- . **metal matrix composites**
- . . aluminum boron composites
- . . aluminum graphite composites
- . . Borsic (tradename)
- . . eutectic composites
- RT aramid fiber composites
- boron fibers
- chemical compatibility
- crack bridging
- electrodeposition
- fiber composites
- fiber pullout
- fiber pushout
- fibers
- functionally gradient materials
- hybrid composites
- ∞ materials
- ∞ matrices
- matrix materials
- monotectic alloys
- particulate reinforced composites
- plasma spraying
- powder metallurgy
- reinforcing fibers
- resin matrix composites
- squeeze casting
- whisker composites

**metal nitrides**

- GS nitrogen compounds
- . nitrides
- . . **metal nitrides**
- . . . aluminum nitrides
- . . . beryllium nitrides
- . . . gallium nitrides
- . . . tantalum nitrides
- . . . titanium nitrides
- . . . zirconium nitrides
- RT transition metals

*metal organic chemical vapor deposition*

USE **metalorganic chemical vapor deposition**

**metal oxide semiconductors**

- UF *MOS (semiconductors)*
- GS electronic equipment
- . solid state devices
- . . semiconductor devices
- . . . **metal oxide semiconductors**
- . . . . CMOS
- . . . . . ITO (semiconductors)
- . . . . . SOS (semiconductors)
- semiconductors (materials)
- . **metal oxide semiconductors**
- . . CMOS
- . . ITO (semiconductors)
- . . SOS (semiconductors)
- RT capacitance-voltage characteristics
- ion implantation
- rectifiers
- SOI (semiconductors)

**metal oxides**

- GS chalcogenides
- . oxides
- . . **metal oxides**
- . . . alkaline earth oxides
- . . . . barium oxides
- . . . . beryllium oxides
- . . . . . alexandrite
- . . . . . calcium oxides
- . . . . . akermanite
- . . . . . magnesium oxides
- . . . . . akermanite
- . . . . . periclase
- . . . aluminum oxides

- . . . . alexandrite
- . . . . sapphire
- . . . . bismuth oxides
- . . . . cerium oxides
- . . . . cesium oxides
- . . . . chromium oxides
- . . . . cobalt oxides
- . . . . copper oxides
- . . . . gallium oxides
- . . . . hafnium oxides
- . . . . iron oxides
- . . . . hematite
- . . . . ilmenite
- . . . . magnetite
- . . . . lanthanum oxides
- . . . . lead oxides
- . . . . lithium oxides
- . . . . manganese oxides
- . . . . Hopcalite (trademark)
- . . . . mercury oxides
- . . . . mixed oxides
- . . . . BSCCO superconductors
- . . . . YBCO superconductors
- . . . . molybdenum oxides
- . . . . nickel oxides
- . . . . niobium oxides
- . . . . platinum oxides
- . . . . plutonium oxides
- . . . . potassium oxides
- . . . . scandium oxides
- . . . . silver oxides
- . . . . sodium peroxides
- . . . . strontium oxides
- . . . . tantalum oxides
- . . . . thorium oxides
- . . . . tin oxides
- . . . . titanium oxides
- . . . . anatase
- . . . . ilmenite
- . . . . rutile
- . . . . tungsten oxides
- . . . . scheelite
- . . . . uranium oxides
- . . . . vanadium oxides
- . . . . yttrium oxides
- . . . . zinc oxides
- . . . . zirconium oxides
- . . . . yttria-stabilized zirconia
- RT cathodic coatings
- high temperature superconductors
- ∞ metal compounds
- oxide films
- vanadates

**metal particles**

- GS particles
- . **metal particles**
- . . metal powder
- . . . platinum black
- . . . powdered aluminum
- . . . . sintered aluminum powder
- RT particulate reinforced composites
- powder metallurgy
- scrap
- sputtering

**metal plates**

- UF *plate (metal)*
- GS structural members
- . plates (structural members)
- . . **metal plates**
- . . . boiler plate
- RT armor
- bars
- billets
- flanges
- flat plates
- girder webs
- parallel plates
- ∞ plates
- rectangular plates
- slabs
- thick plates
- thin plates

**metal polishing**

- UF *polished metals*
- GS polishing
- . **metal polishing**
- . . electropolishing

## metal powder

RT cleaning  
surface finishing

**metal powder**

UF *powdered metals*

GS particles  
. metal particles  
. . . **metal powder**  
. . . . platinum black  
. . . . powdered aluminum  
. . . . sintered aluminum powder  
. powder (particles)  
. . . **metal powder**  
. . . . platinum black  
. . . . powdered aluminum  
. . . . sintered aluminum powder

RT atomizing  
bearing alloys  
comminution  
compressibility  
compressing  
electrodeposition  
flakes  
liquid phase sintering  
metals  
mixing  
porous materials  
powder metallurgy  
reduction (chemistry)  
sintering  
size separation

### metal propellants

GS propellants  
. rocket propellants  
. . solid rocket propellants  
. . . **metal propellants**  
. solid propellants  
. . solid rocket propellants  
. . . **metal propellants**

RT aluminum compounds  
beryllium compounds  
boron compounds  
gelled propellants  
gelled rocket propellants  
hybrid propellants  
monopropellants  
slurry propellants

### metal sheets

UF *sheet metal*

RT plates (structural members)  
∞ sheets

### metal shells

GS shells (structural forms)  
. **metal shells**

RT circular shells  
cylindrical shells  
hemispherical shells  
hulls (structures)  
membrane structures  
orthotropic shells  
reinforced shells  
skin (structural member)  
spherical shells  
thin walled shells  
toroidal shells

### metal spinning

UF *spin forging*  
*spinning (metallurgy)*

GS forming techniques  
. **metal spinning**  
. . hydrospinning  
metal working  
. **metal spinning**  
. . hydrospinning  
spin  
. **metal spinning**  
. . hydrospinning

RT cold working  
extruding  
hot working

### metal spraying

GS spraying  
. **metal spraying**

RT arc spraying  
coating

coatings  
flame spraying  
HVOF thermal spraying  
metallizing  
surface finishing

### metal strips

RT billets  
ribbons  
strakes  
∞ strip  
strip transmission lines

### metal surfaces

RT adatoms  
crack initiation  
crystal surfaces  
erosion  
gas-solid interfaces  
liquid-solid interfaces  
oxide films  
solid surfaces  
surface finishing  
surface properties  
surface reactions  
∞ surfaces

### metal vapor lasers

DEF Stimulated emission devices, the active materials of which are vaporized metals.

GS stimulated emission devices  
. lasers  
. . **metal vapor lasers**

RT laser materials  
laser microscopy  
optical pumping

### metal vapors

GS metals  
. **metal vapors**  
. . mercury vapor  
. . sodium vapor  
vapors  
. **metal vapors**  
. . mercury vapor  
. . sodium vapor

RT alkali metals  
alkali vapor lamps  
gas-metal interactions  
heat transfer  
liquid metals  
vapor deposition

### metal whisker reinforcement

USE **whisker composites**

### metal working

SN (METAL DEFORMATION FOR CHANGING SHAPE AND FOR PROPERTIES--EXCLUDES CASTING, CUTTING, DEPOSITION PROCESS AND MACHINING)

UF *metal forming*

GS **metal working**  
. ausforming  
. bulging  
. cladding  
. coining  
. explosive forming  
. forging  
. hydroforming  
. magnetic forming  
. metal drawing  
. metal spinning  
. . hydrospinning  
. sizing (shaping)

RT brakes (forming or bending)  
∞ breakdown  
casting  
cold pressing  
cold rolling  
cold working  
decarburization  
deep drawing  
dimpling  
electrohydraulic forming  
electromagnetic hammers  
explosive welding  
extruding  
flattening  
forming techniques

hardening (materials)  
hot isostatic pressing  
hot pressing  
hot working  
laser applications  
laser machining  
leveling  
machining  
malleability  
∞ metallurgy  
micromachining  
peening  
perforating  
piercing  
plasma arc cutting  
pressing (forming)  
pyrometallurgy  
∞ reduction  
roll forming  
∞ rolling  
shearing  
shot peening  
squeeze casting  
stamping  
stretch forming  
stretching  
superplastic forming  
swaging  
tempering  
winding  
work hardening

### metal-barrier-metal junctions

USE **MBM junctions**

### metal-gas systems

RT gas lubricants  
gases  
gas-metal interactions  
metals  
∞ systems  
vapor phases

### metal-insulator-metal diodes

USE **MIM diodes**

### metal-insulator-metal semiconductors

USE **MIM (semiconductors)**

### metallic glasses

DEF Amorphous alloys (glassy metals) produced by extremely rapid quenching of molten transition-metal alloys (e.g., iron, nickel, and/or cobalt). These metallic glasses exhibit unique mechanical, magnetic, and electrical properties, superconductive behavior, and anticorrosion resistance, depending on the alloys, their formation and quenching techniques.

GS glass  
. **metallic glasses**

RT glass coatings  
glass fibers  
optical properties  
silicon dioxide  
spin glass  
vitreous materials

### metallic hydrogen

GS chemical elements  
. hydrogen  
. . hydrogen isotopes  
. . . **metallic hydrogen**  
. nuclides  
. isotopes  
. . . hydrogen isotopes  
. . . . **metallic hydrogen**  
gases  
. hydrogen  
. . hydrogen isotopes  
. . . **metallic hydrogen**

RT critical temperature  
solid phases  
solid state  
solidified gases  
solids

### metallic plasmas

GS particles  
. charged particles  
. . energetic particles

- ... plasmas (physics)
- ... **metallic plasmas**
- ... cesium plasma
- ... uranium plasmas
- . corpuscular radiation
- . energetic particles
- . plasmas (physics)
- ... **metallic plasmas**
- ... cesium plasma
- ... uranium plasmas
- RT electron plasma
- mercury arcs
- plasma sheaths
  
- metallic stars**
- GS celestial bodies
- . stars
- . **metallic stars**
- RT abundance
- chemical composition
- metallicity
- stellar atmospheres
- stellar structure
  
- metallicity**
- DEF The abundance index of a metal or metals for a celestial body.
- RT abundance
- chemical analysis
- chemical composition
- galactic clusters
- galaxies
- globular clusters
- hydrogen
- interstellar matter
- mass ratios
- metallic stars
- metals
- spectroscopic analysis
- star clusters
- stars
  
- metallizing**
- GS coating
- . **metallizing**
- coatings
- . **metallizing**
- RT cladding
- electroplating
- finishes
- flame spraying
- laminates
- metal coatings
- metal films
- metal spraying
- plating
- spraying
- substrates
- vapor deposition
  
- metallography**
- RT abrasion
- alloys
- anisotropy
- crystal lattices
- crystallography
- electropolishing
- etching
- ferrography
- inclusions
- isotropy
- ∞ materials tests
- metal crystals
- ∞ metallurgy
- metals
- microporosity
- microscopes
- microstructure
- mushy zones
- order-disorder transformations
- photomicrography
- polishing
- radiography
- replicas
- solid suspensions
- time temperature parameter
- vibratory polishing
- Widmanstatten structure
  
- x ray diffraction
  
- metalloids**
- UF *semimetals*
- GS chemical elements
- . **metalloids**
- . antimony
- . antimony isotopes
- . arsenic
- . . . arsenic isotopes
- . boron
- . . . boron isotopes
- . . . boron 10
- . germanium
- . . . germanium isotopes
- . polonium
- . . . polonium isotopes
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- . silicon
- . . . amorphous silicon
- . . . porous silicon
- . . . silicon isotopes
- . tellurium
- . . . tellurium isotopes
- RT alloys
- arsenic alloys
- boron alloys
- intermetallics
- metals
- organometallic compounds
- semiconductors (materials)
  
- metalloorganic compounds*
- USE **organometallic compounds**
  
- metalloxiloxane polymers*
- USE **organometallic polymers**
  
- metalloxane polymers*
- USE **organometallic polymers**
  
- ∞ **metallurgy**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT alloying
- alloys
- beneficiation
- casting
- coating
- coatings
- corrosion
- crystallography
- dispersion strengthening
- duplex operation
- ferrous metals
- foundries
- fractography
- furnaces
- hardening (materials)
- heat affected zone
- heat treatment
- hydrometallurgy
- levitation melting
- light alloys
- mechanical properties
- melt spinning
- melting
- metal coatings
- metal foams
- metal working
- metallography
- metals
- nonferrous metals
- ∞ physical sciences
- powder metallurgy
- pyrometallurgy
- rapid quenching (metallurgy)
- recrystallization
- ∞ science
- smelting
- thermomechanical treatment
  
- metal-metal bonding**
- GS bonding
- . metal bonding
- . **metal-metal bonding**
- RT adhesive bonding
- adhesives
  
- diffusion welding
- explosive welding
- heat affected zone
- inertia bonding
- resin bonding
- soldering
- welding
  
- metal-nitride-oxide-semiconductors**
- DEF Class of semiconductors utilizing silicon nitride and silicon oxide dielectrics.
- GS electronic equipment
- . solid state devices
- . . .
- metal-nitride-oxide-semiconductors**
- semiconductors (materials)
- .
- metal-nitride-oxide-semiconductors**
- RT chips (memory devices)
  
- metal-nitride-oxide-silicon**
- UF *MNOS*
- GS semiconductors (materials)
- . **metal-nitride-oxide-silicon**
  
- metalorganic chemical vapor deposition**
- (added May 1991)
- UF *metal organic chemical vapor deposition*
- MOCVD (vapor deposition)*
- OMCVD (vapor deposition)*
- organometallic vapor deposition*
- GS deposition
- . vapor deposition
- . **metalorganic chemical vapor deposition**
- deposition**
- RT coating
- crystal growth
- organometallic compounds
- space processing
  
- metal-oxide-metal semiconductors*
- USE **MOM (semiconductors)**
  
- metals**
- UF *magnetic metals*
- GS **metals**
- . actinide series
- . . actinium
- . . . radium
- . . . . radium isotopes
- . . . . radium 226
- . . . thorium
- . . . thorium isotopes
- . . . transuranium elements
- . . . americium
- . . . . americium isotopes
- . . . . . americium 241
- . . . berkelium
- . . . californium
- . . . . californium isotopes
- . . . curium
- . . . . curium isotopes
- . . . . . curium 242
- . . . . . curium 244
- . . . einsteinium
- . . . fermium
- . . . lawrencium
- . . . mendelevium
- . . . neptunium
- . . . . neptunium isotopes
- . . . nobelium
- . . . plutonium
- . . . . plutonium isotopes
- . . . . . plutonium 238
- . . . . . plutonium 239
- . . . . . plutonium 240
- . . . . . plutonium 241
- . . . . . plutonium 244
- . . . sergenium
- . . . uranium
- . . . . uranium isotopes
- . . . . . uranium 232
- . . . . . uranium 233
- . . . . . uranium 234
- . . . . . uranium 235
- . . . . . uranium 238
- . . . alkali metals
- . . . cesium
- . . . . cesium isotopes

**metal-water reactions**

- . . . . cesium 133
- . . . . cesium 134
- . . . . cesium 137
- . . . . cesium 144
- . . cesium vapor
- . . francium
- . . lithium
- . . liquid lithium
- . . lithium isotopes
- . . potassium
- . . liquid potassium
- . . potassium isotopes
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- . . rubidium
- . . rubidium isotopes
- . . . . rubidium 86
- . . sodium
- . . liquid sodium
- . . sodium isotopes
- . . . . sodium 22
- . . . . sodium 24
- . . sodium vapor
- . alkaline earth metals
- . . barium isotopes
- . aluminum
- . . aluminum isotopes
- . . . . aluminum 26
- . . . . aluminum 27
- . . antimony isotopes
- . . astatine
- . . astatine isotopes
- . . barium
- . . barium isotopes
- . beryllium
- . . beryllium isotopes
- . . . . beryllium 7
- . . . . beryllium 9
- . . . . beryllium 10
- . bismuth
- . . bismuth isotopes
- . calcium
- . . calcium isotopes
- . ferrous metals
- . gallium
- . . gallium isotopes
- . indium
- . . indium isotopes
- . lead (metal)
- . . lead isotopes
- . liquid metals
- . . liquid lithium
- . . liquid potassium
- . . liquid sodium
- . . mercury (metal)
- . . . . mercury isotopes
- . . . . mercury vapor
- . magnesium
- . . magnesium isotopes
- . metal vapors
- . . mercury vapor
- . . sodium vapor
- . noble metals
- . . gold
- . . . . gold isotopes
- . . . . gold 198
- . . ruthenium
- . . . . ruthenium isotopes
- . . silver
- . . . . silver isotopes
- . nonferrous metals
- . . protactinium
- . . protactinium isotopes
- . rare earth elements
- . . cerium
- . . . . cerium isotopes
- . . . . cerium 137
- . . . . cerium 144
- . . dysprosium
- . . . . dysprosium isotopes
- . . erbium
- . . . . erbium isotopes
- . . europium
- . . . . europium isotopes
- . . gadolinium
- . . . . gadolinium isotopes
- . . holmium
- . . . . holmium isotopes

- . . lanthanum
- . . . . lanthanum isotopes
- . . lutetium
- . . . . lutetium isotopes
- . . neodymium
- . . . . neodymium isotopes
- . . praseodymium
- . . . . praseodymium isotopes
- . . promethium
- . . . . promethium isotopes
- . . samarium
- . . . . samarium isotopes
- . . scandium
- . . . . scandium isotopes
- . . terbium
- . . . . terbium isotopes
- . . thulium
- . . . . thulium isotopes
- . . ytterbium
- . . . . ytterbium isotopes
- . . yttrium
- . . . . yttrium isotopes
- . refractory metals
- . chromium
- . . . . chromium isotopes
- . . iridium
- . . . . iridium isotopes
- . . molybdenum
- . . niobium
- . . . . niobium isotopes
- . . . . niobium 95
- . . osmium
- . . . . osmium isotopes
- . . rhenium
- . . . . rhenium isotopes
- . . tantalum
- . . . . tantalum isotopes
- . . tungsten
- . . . . tungsten isotopes
- . strontium
- . . . . strontium isotopes
- . . . . strontium 85
- . . . . strontium 87
- . . . . strontium 89
- . . . . strontium 90
- . thallium
- . . thallium isotopes
- . tin
- . . tin isotopes
- . transition metals
- . . cadmium
- . . . . cadmium isotopes
- . . chromium
- . . . . chromium isotopes
- . . cobalt
- . . . . cobalt isotopes
- . . . . cobalt 58
- . . . . cobalt 60
- . . copper
- . . . . copper isotopes
- . . gold
- . . . . gold isotopes
- . . . . gold 198
- . . hafnium
- . . . . hafnium isotopes
- . . iridium
- . . . . iridium isotopes
- . . iron
- . . . . iron isotopes
- . . . . iron 57
- . . . . iron 58
- . . . . iron 59
- . . manganese
- . . . . manganese isotopes
- . . mercury (metal)
- . . . . mercury isotopes
- . . . . mercury vapor
- . . molybdenum
- . . nickel
- . . . . nickel isotopes
- . . niobium
- . . . . niobium isotopes
- . . . . niobium 95
- . . osmium
- . . . . osmium isotopes
- . . palladium
- . . platinum
- . . . . platinum isotopes
- . . rhenium

- . . . rhenium isotopes
- . . rhodium
- . . . . rhodium isotopes
- . . ruthenium
- . . . . ruthenium isotopes
- . . scandium
- . . . . scandium isotopes
- . . silver
- . . . . silver isotopes
- . . tantalum
- . . . . tantalum isotopes
- . . technetium
- . . . . technetium isotopes
- . . titanium
- . . . . titanium isotopes
- . . tungsten
- . . . . tungsten isotopes
- . . vanadium
- . . . . vanadium isotopes
- . . yttrium
- . . . . yttrium isotopes
- . . zinc
- . . . . zinc isotopes
- . . zirconium
- . . . . zirconium isotopes
- . . . . zirconium 95
- . heavy metals
- . ultrapure metals
- . uranium plasmas
- RT alloys
- antimony
- arsenic
- arsenic isotopes
- bimetals
- Borsic (tradename)
- cermets
- chemical elements
- composite materials
- conductors
- embedded atom method
- eutectic composites
- gadolinium alloys
- intermetallics
- isotopes
- light alloys
- liquid alloys
- metal clusters
- metal coatings
- metal combustion
- ∞ metal compounds
- metal crystals
- metal films
- metal foils
- metal fuels
- metal ions
- metal powder
- metal-gas systems
- metallicity
- metallography
- metalloids
- ∞ metallurgy
- monotectic alloys
- palladium compounds
- polonium
- polonium 208
- polonium 209
- polonium 210
- polonium isotopes
- strategic materials
- syntectic alloys

*metal-semiconductor-metal semiconductors*  
 USE **MSM (semiconductors)**

**metal-water reactions**  
 GS chemical reactions  
 . **metal-water reactions**  
 RT corrosion  
 electrochemical corrosion  
 erosion  
 pitting  
 rusting  
 surface reactions

**metamorphic rocks**  
 DEF Rocks derived from pre-existing rocks by mineralogical, chemical and/or structural changes, essentially in the solid state. These changes are in response to marked changes in temperature, pressure, shearing stress, and

chemical environment, generally at the depth of the Earth's crust. Metamorphic rocks constitute one of the three main classes into which rocks are divided, the others being igneous rocks and sedimentary rocks.

- GS rocks
  - . **metamorphic rocks**
  - . . quartzite
- RT metamorphism (geology)

**metamorphism (geology)**

DEF The mineralogical and structural adjustment of solid rocks to physical and chemical conditions which have been imposed at depth below the surface zones of weathering and cementation, which differ from the conditions under which the rocks in question originated.

- RT contacts (geology)
  - metamorphic rocks
  - phase transformations
  - rocks

*metastability*

- USE **metastable state**

**metastable atoms**

- GS atoms
  - . **metastable atoms**
- RT Penning effect

**metastable state**

- UF *metastability*
- RT excitation
  - radiation trapping
  - stability
  - steady state
  - unsteady state

**metastasis**

(added February 2002)

DEF The transfer of a neoplasm from one organ or part of the body to another remote from the primary site.

- RT cancer
  - lymphatic system
  - neoplasms

**metathesis**

- GS chemical reactions
  - . **metathesis**
- RT electrolysis
  - ion exchanging

*metazoa*

- USE **animals**

**Meteor 1 rocket vehicle**

- GS rocket vehicles
  - . **Meteor 1 rocket vehicle**
- RT liquid propellant rocket engines
  - ramjet engines
  - solid propellant rocket engines

*meteor bursts*

- USE **meteoroid showers**

*meteor craters*

- USE **meteorite craters**

*meteor hazards*

- USE **meteoroid hazards**

**meteor trails**

DEF Anything, such as light or ionization, left along the trajectory of the meteor after the head of the meteor has passed. Used for meteoritic ionization.

- UF *meteoritic ionization*
- RT bolides
  - Earth atmosphere
  - meteoroid showers
  - meteoroids
  - micrometeoroids
- ∞ paths
  - Pribram meteorite
  - radio meteors
  - scatter propagation
  - sporadic meteoroids
- ∞ tracks

upper atmosphere

**meteorite collisions**

- UF *meteorite impacts*
- GS collisions
  - . **meteorite collisions**
- RT asteroid collisions
  - cometary collisions
  - hypervelocity impact
  - meteoritic damage
  - meteoroid hazards
  - near Earth objects
  - shatter cones
  - Tungusk meteorite

*meteorite compression tests*

- USE **compression tests**
  - mechanical properties**
  - meteorites**

**meteorite craters**

- UF *fossil meteorite craters*
  - meteor craters*
  - meteoroid craters*
- GS craters
  - . **meteorite craters**
- RT Canadian Shield
  - cratering
  - ejecta
  - lunar craters
  - lunar rays
  - maria
  - Mars craters
  - Mars surface
  - meteorites
  - meteoritic damage
  - planetary craters
  - projectile cratering
  - Ptolemaeus Crater
  - shatter cones
  - Tungusk meteorite
  - Tycho crater

*meteorite impacts*

(added July 2002)

- USE **meteorite collisions**

**meteorite parent bodies**

(added August 2001)

DEF Any celestial body that is the original source of meteoritic material.

- UF *meteoroid parent bodies*
- GS celestial bodies
  - . **meteorite parent bodies**
- RT asteroid belts
  - asteroids
  - comets
  - meteorites
  - meteoritic composition
  - meteoritic microstructures
- ∞ origins
  - petrogenesis

**meteorites**

SN (LIMITED TO METEOROIDS WHICH HAVE REACHED THE SURFACE OF AN ASTEROID, NATURAL SATELLITE OR PLANET)

DEF Meteoroids which have reached the surface of the Earth without being completely vaporized. Used for meteorite compression tests.

- UF *meteorite compression tests*
- GS celestial bodies
  - . **meteorites**
  - . . iron meteorites
  - . . . Aroos meteorite
  - . . . Lazarev meteorite
  - . . . Odessa meteorite
  - . . . Sikhote-Alin meteorite
  - . . micrometeorites
  - . . stony meteorites
  - . . . achondrites
  - . . . Bondoc meteorite
  - . . . chassignites
  - . . . Kapoeta achondrite
  - . . . nakhlites
  - . . . Norton County achondrite
  - . . . shergottites
  - . . . SNC meteorites
  - . . . ureilites

- . . . carbonaceous meteorites
- . . . carbonaceous chondrites
- . . . . Alais meteorite
- . . . . Allende meteorite
- . . . . Cold Bokkeveld meteorite
- . . . . Ivuna meteorite
- . . . . Murchison meteorite
- . . . . Murray meteorite
- . . . . Orgueil meteorite
- . . . . Tonk meteorite
- . . . ureilites
- . . chondrites
- . . . Bruderheim meteorite
- . . . carbonaceous chondrites
- . . . . Alais meteorite
- . . . . Allende meteorite
- . . . . Cold Bokkeveld meteorite
- . . . . Ivuna meteorite
- . . . . Murchison meteorite
- . . . . Murray meteorite
- . . . . Orgueil meteorite
- . . . . Tonk meteorite
- . . . Harleton meteorite
- . . . Hvittis chondrite
- . . . Okhansk meteorite
- . . . Pantar chondrites
- . . . Pribram meteorite
- . . . tektites
- . . . australites
- . . . bediasites
- . . . Tungusk meteorite
- . . stony-iron meteorites
- RT bolides
- chondrule
- coesite
- foreign bodies
- impact melts
- meteorite craters
- meteorite parent bodies
- meteoritic composition
- meteoritic microstructures
- meteoroid showers
- meteoroids
- micrometeoroids
- oldavite
- near Earth objects

**meteoritic composition**

- GS composition (property)
  - . **meteoritic composition**
- RT carbonaceous meteorites
  - cosmochemistry
  - iron meteorites
  - isotope ratios
  - kamacite
  - meteorite parent bodies
  - meteorites
  - schreibersite
  - siderophile elements
  - solar nebula
  - stony meteorites
  - tektites
  - trollite
  - veins (petrology)

**meteoritic damage**

- GS damage
  - . impact damage
  - . . **meteoritic damage**
- RT ∞ bombardment
  - cratering
  - ejecta
  - hypervelocity impact
  - Mars craters
  - meteorite collisions
  - meteorite craters
  - meteoroid hazards
  - meteoroid protection
  - projectile cratering

**meteoritic diamonds**

- GS diamonds
  - . **meteoritic diamonds**



## meteoritic microstructures

RT urelites

*meteoritic dust*  
USE **micrometeoroids**

*meteoritic ionization*  
USE **atmospheric ionization**  
**meteor trails**

**meteoritic microstructures**  
GS microstructure  
. **meteoritic microstructures**  
RT chondrule  
iron meteorites  
meteorite parent bodies  
meteorites  
stony meteorites  
tektites  
Widmanstätten structure

**meteoroid concentration**  
GS composition (property)  
. concentration (composition)  
. . **meteoroid concentration**  
density (number/volume)  
. **meteoroid concentration**  
RT flux density  
mass distribution  
spatial distribution  
sporadic meteoroids

*meteoroid craters*  
USE **meteorite craters**

**meteoroid dust clouds**  
GS celestial bodies  
. meteoroids  
. . micrometeoroids  
. . . **meteoroid dust clouds**  
. . . . zodiacal dust  
extraterrestrial matter  
. interstellar matter  
. . cosmic dust  
. . . interplanetary dust  
. . . . **meteoroid dust clouds**  
. . . . . zodiacal dust  
media  
. interplanetary medium  
. . interplanetary dust  
. . . **meteoroid dust clouds**  
. . . . zodiacal dust  
particles  
. dust  
. . cosmic dust  
. . . interplanetary dust  
. . . . **meteoroid dust clouds**  
. . . . . zodiacal dust  
RT ∞ clouds  
Explorer satellites  
terrestrial dust belt

**meteoroid hazards**  
UF *meteor hazards*  
GS hazards  
. flight hazards  
. . **meteoroid hazards**  
RT meteorite collisions  
meteoritic damage  
meteoroids  
operational hazards  
projectile cratering  
spacecraft breakup

*meteoroid parent bodies*  
(added August 2001)  
USE **meteorite parent bodies**

**meteoroid protection**  
GS protection  
. **meteoroid protection**  
RT bumpers  
impact damage  
meteoritic damage  
spacecraft shielding  
spacecraft structures

**meteoroid showers**  
DEF Groups of meteoroids with approximately parallel trajectories. Used for meteor bursts.

UF *meteor bursts*  
GS celestial bodies  
. **meteoroid showers**  
. . Aquarid meteoroids  
. . Arietid meteoroids  
. . Cyrillid meteoroids  
. . Draconid meteoroids  
. . Geminid meteoroids  
. . Leonid meteoroids  
. . Orionid meteoroids  
. . Perseid meteoroids  
. . Quadrantid meteoroids  
. . Taurid meteoroids

RT astronomy  
bolides  
comets  
meteor trails  
meteorites  
meteoroids  
∞ showers

*Meteoroid Technology Satellite*  
USE **Explorer 46 satellite**

**meteoroids**  
SN (LIMITED TO SOLID OBJECTS IN SPACE, MUCH SMALLER THAN AN ASTEROID AND MUCH LARGER THAN A MOLECULE)  
DEF Solid objects moving in interplanetary space, of a size considerably smaller than asteroids and considerably larger than atoms or molecules. Used for meteors.  
UF *meteors*  
GS celestial bodies  
. **meteoroids**  
. . Aquarid meteoroids  
. . Arietid meteoroids  
. . bolides  
. . . Cyrillid meteoroids  
. . Draconid meteoroids  
. . Geminid meteoroids  
. . Leonid meteoroids  
. . micrometeoroids  
. . . meteoroid dust clouds  
. . . . zodiacal dust  
. . Orionid meteoroids  
. . Perseid meteoroids  
. . Quadrantid meteoroids  
. . radio meteors  
. . sporadic meteoroids  
. . Taurid meteoroids

RT asteroid belts  
asteroids  
bumpers  
Chiron  
comets  
cosmic dust  
Gaspra asteroid  
hypervelocity projectiles  
Iida asteroid  
interplanetary dust  
interplanetary medium  
meteor trails  
meteorites  
meteoroid hazards  
meteoroid showers  
micrometeorites  
natural satellites  
particle tracks  
Radiation Meteoroid spacecraft  
solar system  
space debris  
Tempel 2 comet  
Toro asteroid  
Toutatis asteroid  
Vesta asteroid

**meteorological balloons**  
GS expandable structures  
. inflatable structures  
. . balloons  
. . . **meteorological balloons**  
. . . . jimsphere balloons  
. . . . . ROBIN balloons  
RT dropsondes  
high altitude balloons  
radiosondes  
rawinsondes  
rockoons  
skyhook balloons

sounding  
superpressure balloons  
tethered balloons  
upper atmosphere  
weather forecasting

**meteorological charts**  
UF *weather charts*  
*weather maps*  
GS charts  
. **meteorological charts**  
maps  
. **meteorological charts**  
RT isobars (pressure)  
radar maps  
synoptic meteorology

**meteorological flight**  
RT aerial reconnaissance  
balloon flight  
∞ flight  
ice reporting  
rocket flight  
SIRS B satellite  
sounding  
space flight  
weather forecasting

**meteorological instruments**  
GS measuring instruments  
. **meteorological instruments**  
. . barometers  
. . cloud height indicators  
. . dropsondes  
. . radiometeorographs  
. . radiosondes  
. . . ionosondes  
. . . rawinsondes  
. . ozonesondes  
. . rain gages  
. . weather data recorders  
. . wind vanes  
RT anemometers  
balloon-borne instruments  
hot-film anemometers  
hot-wire anemometers  
humidity measurement  
hygrometers  
hypsometers  
∞ instruments  
light scattering meters  
meteorology  
nephanalysis  
precipitation measurement  
psychrometers  
recording instruments  
rocket-borne instruments  
SIRS B satellite  
sodar  
sound detecting and ranging  
sounding rockets  
transducers  
weather reconnaissance aircraft  
weather stations

**meteorological parameters**  
GS constraints  
. **meteorological parameters**  
. . Brunt-Vaisala frequency  
RT aerology  
agroclimatology  
annual variations  
Atmospheric & Oceanographic Inform Sys  
Atmospheric Cloud Physics Lab (Spacelab)  
atmospheric pressure  
atmospheric temperature  
atmospheric turbulence  
aviation meteorology  
ceilings (meteorology)  
cloud cover  
cockpit weather information systems  
cold fronts  
equatorial atmosphere  
fronts (meteorology)  
hindcasting  
humidity  
isotherms  
moisture

ocean data acquisitions systems  
oceanographic parameters  
precipitation (meteorology)  
storms (meteorology)  
teleconnections (meteorology)  
temperature inversions  
tropical meteorology  
warm fronts  
weather  
wind direction  
wind measurement  
wind velocity

*meteorological probes*  
USE **sondes**

**meteorological radar**  
UF *weather radar*  
GS radar  
. **meteorological radar**  
RT precipitation measurement  
precipitation particle measurement  
pulse radar  
radar scanning  
radar tracking  
radio meteorology  
surveillance radar  
weather forecasting

**meteorological research aircraft**  
GS research vehicles  
. research aircraft  
. **meteorological research aircraft**  
RT ∞ aircraft  
data acquisition

*meteorological rockets*  
USE **sounding rockets**

**meteorological satellites**  
GS artificial satellites  
. **meteorological satellites**  
. . AEROS satellite  
. . Cosmos 144 satellite  
. . D-2 satellites  
. . DMSP satellites  
. . Elektron satellites  
. . Elektron 1 satellite  
. . Elektron 2 satellite  
. . Elektron 4 satellite  
. . EOLE satellites  
. . ESSA satellites  
. . ESSA 1 satellite  
. . ESSA 2 satellite  
. . ESSA 3 satellite  
. . ESSA 4 satellite  
. . ESSA 5 satellite  
. . ESSA 6 satellite  
. . ESSA 7 satellite  
. . ESSA 8 satellite  
. . ESSA 9 satellite  
. . Explorer 9 satellite  
. . Explorer 17 satellite  
. . Explorer 19 satellite  
. . GEOLE satellites  
. . GOES satellites  
. . GOES 1  
. . GOES 2  
. . GOES 3  
. . GOES 4  
. . GOES 5  
. . GOES 6  
. . GOES 7  
. . GOES 8  
. . GOES 9  
. . GOES 10  
. . GOES 13  
. . METEOSAT satellite  
. . Nimbus satellites  
. . . Nimbus 1 satellite  
. . . Nimbus 2 satellite  
. . . Nimbus 3 satellite  
. . . Nimbus 4 satellite  
. . . Nimbus 5 satellite  
. . . Nimbus 6 satellite  
. . . Nimbus 7 satellite  
. . NOAA satellites  
. . . NOAA 2 satellite  
. . . NOAA 3 satellite  
. . . NOAA 4 satellite

. . . NOAA 5 satellite  
. . . NOAA 6 satellite  
. . . NOAA 7 satellite  
. . . NOAA 8 satellite  
. . . NOAA 9 satellite  
. . . NOAA 10 satellite  
. . . NOAA 11 satellite  
. . . NOAA 12 satellite  
. . . NOAA 14 satellite  
. . . NOAA 19 satellite  
. . San Marco satellites  
. . . San Marco 1 satellite  
. . . San Marco 2 satellite  
. . . San Marco 3 satellite  
. . SEOCS (satellite)  
. . SIRS B satellite  
. . Sputnik 1 satellite  
. . Sputnik 2 satellite  
. . Sputnik 3 satellite  
. . SRET satellites  
. . . SRET 1 satellite  
. . . SRET 2 satellite  
. . Synchronous Earth Observatory  
satellite  
. . . SMS 1  
. . . SMS 2  
. . Synchronous Meteorological  
Satellite  
. . . SMS 1  
. . . SMS 2  
. . TIROS satellites  
. . . ITOS satellites  
. . . ITOS 1  
. . . ITOS 2  
. . . ITOS 3  
. . . ITOS 4  
. . TIROS 1 satellite  
. . TIROS 2 satellite  
. . TIROS 3 satellite  
. . TIROS 4 satellite  
. . TIROS 5 satellite  
. . TIROS 6 satellite  
. . TIROS 7 satellite  
. . TIROS 8 satellite  
. . TIROS 9 satellite  
. . TIROS 10 satellite  
. . TIROS M  
. . TIROS N series satellites  
. . . NOAA 6 satellite  
. . NPOESS  
. . TRMM satellite  
. . Vanguard 2 satellite

RT AgRISTARS project  
ATS  
CALIPSO (Pathfinder satellite)  
cloud photography  
CloudSat  
geophysical satellites  
GOES 1  
GOES 2  
GOES 3  
GOES 4  
GOES 5  
infrared photography  
Japanese space program  
meteorology  
military spacecraft  
navigation satellites  
Nimbus project  
NOESS  
precipitation measurement  
satellite observation  
satellite sounding  
satellite television  
sounding rockets  
space probes  
TIROS project  
unmanned spacecraft  
Vanguard satellites  
weather forecasting  
weather stations

**meteorological services**  
UF *World Weather Watch  
WWW (meteorology)*  
GS services  
. **meteorological services**  
RT automatic weather stations  
aviation meteorology

flight conditions  
weather forecasting  
weather stations

**meteorological solenoids**  
RT baroclinity  
vortices

*meteorological stations*  
USE **weather stations**

**meteorology**  
DEF The study dealing with the phenomena  
of the atmosphere especially as they relate to  
weather and climate. Used for atmospheric con-  
ditions.  
UF *atmospheric conditions*  
GS **meteorology**  
. aerology  
. agrometeorology  
. Alpine meteorology  
. aviation meteorology  
. biometeorology  
. hydrometeorology  
. . marine meteorology  
. mesometeorology  
. micrometeorology  
. . microbursts (meteorology)  
. nuclear meteorology  
. planetary meteorology  
. polar meteorology  
. radio meteorology  
. synoptic meteorology  
. tropical meteorology  
. weather forecasting  
. . long range weather forecasting  
. . nowcasting  
. . numerical weather forecasting  
. . statistical weather forecasting

RT acid rain  
acoustic sounding  
aeronomy  
agroclimatology  
air land interactions  
air masses  
annual variations  
anticyclones  
anvil clouds  
arc clouds  
∞ atmospheres  
Atmospheric & Oceanographic Inform  
Sys  
atmospheric density  
atmospheric physics  
atmospheric turbulence  
baroclinic instability  
brightness temperature  
CALIPSO (Pathfinder satellite)  
cap clouds  
ceilings (meteorology)  
cirrocumulus clouds  
cirrostratus clouds  
cirrus shields  
climate  
climatology  
cloud cover  
clouds (meteorology)  
CloudSat  
cold fronts  
condensation nuclei  
convection  
convection clouds  
Coriolis effect  
cyclones  
DMSP satellites  
Earth cryosphere  
Earth sciences  
environmental engineering  
environmental monitoring  
fronts (meteorology)  
GARP Atlantic Tropical Experiment  
geology  
geophysics  
Global Atmospheric Research  
Program  
hailstorms  
humidity  
hurricanes  
hydroclimatology  
hydrodynamic equations

## METEOSAT satellite

hydrography  
hydrology  
insolation  
isotherms  
mesoscale phenomena  
meteorological instruments  
meteorological satellites  
METEOSAT satellite  
method of characteristics  
moisture  
National Severe Storms Project  
nephelometry  
NOESS  
oceanography  
∞ physical sciences  
precipitation (meteorology)  
∞ science  
sea breeze  
seasons  
sodar  
sound detecting and ranging  
storms (meteorology)  
teleconnections (meteorology)  
temperature  
temperature inversions  
tropical regions  
tropical storms  
typhoons  
warm fronts  
weather  
wind (meteorology)  
wind measurement  
World Meteorological Organization  
zonal flow (meteorology)

### *meteors*

USE **meteoroids**

### **METEOSAT satellite**

GS artificial satellites  
. ESA satellites  
. . **METEOSAT satellite**  
. meteorological satellites  
. . **METEOSAT satellite**  
ESA spacecraft  
. ESA satellites  
. . **METEOSAT satellite**  
RT cloud cover  
cloud photography  
European Space Agency  
European space programs  
French satellites  
French space program  
infrared photography  
ISCCP Project  
meteorology  
satellite observation  
weather

### *meters*

USE **measuring instruments**

### *methacrylate resins*

USE **acrylic resins**

### **methamphetamine**

GS drugs  
. **methamphetamine**  
organic compounds  
. amines  
. . amphetamines  
. . . **methamphetamine**

### **methanation**

DEF The conversion of various organic compounds to produce methane.

GS chemical reactions  
. **methanation**  
RT biomass energy production  
coal gasification  
hydrocarbon fuels  
hydrolysis

### **methane**

GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . alkanes  
. . . . **methane**  
RT bioconversion

chlorofluoromethane  
coal derived gases  
hydrocarbon fuels  
hydrolysis  
landfills  
liquefied natural gas  
natural gas  
natural gas exploration  
Neptune atmosphere  
oil fields  
petroleum products  
solvent refined coal  
synthane  
Uranus atmosphere

### *methanol*

USE **methyl alcohol**

### *methenyl*

USE **methylidyne**

### **methionine**

GS acids  
. amino acids  
. . **methionine**  
organic compounds  
. amino acids  
. . **methionine**

### **method of characteristics**

UF *characteristic method*  
RT ∞ characteristics  
compressible fluids  
flow distribution  
hyperbolic functions  
meteorology  
∞ methodology  
partial differential equations  
plastic properties  
Prandtl-Meyer expansion  
steady flow  
unsteady flow

### **method of moments**

DEF A method of estimating the parameters of a distribution by relating the parameters to moments.

RT distribution moments  
integral equations  
mathematical models  
matrices (mathematics)  
∞ methodology  
moment distribution  
moments  
numerical analysis

### ∞ **methodology**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *methods*  
*techniques*  
RT approximation  
asymptotic methods  
Biot method  
boundary integral method  
Bridgman method  
cluster variation method  
critical path method  
Crocco method  
Czochralski method  
Debye-Scherrer method  
Delphi method (forecasting)  
digital techniques  
embedded atom method  
emergency breathing techniques  
Encke method  
energy methods  
equilibrium methods  
ethics  
finite element method  
finite volume method  
Fujita method  
Galerkin method  
GERT  
Glimm method  
Halphen method  
Hartree-Fock-Slater method  
heuristic methods  
Hill method  
imaging techniques

in vitro methods and tests  
in vivo methods and tests  
Jacobi matrix method  
Kjeldahl method  
Latin square method  
Laue method  
least squares method  
Lighthill method  
management methods  
matrix management  
matrix methods  
maximum entropy method  
Maxwell-Mohr method  
∞ mechanism  
method of characteristics  
method of moments  
Milne method  
Milne-Thomson method  
minimum entropy method  
Moire effects  
Monte Carlo method  
multigrid methods  
Newton-Raphson method  
panel method (fluid dynamics)  
particle in cell technique  
pattern method (forecasting)  
Percus method  
Pohlhausen method  
probe method (forecasting)  
problem solving  
profile method (forecasting)  
Rayleigh-Ritz method  
relaxation method (mathematics)  
Ritz averaging method  
ruler method  
Runge-Kutta method  
Schmidt method  
Schwartz method  
simplex method  
spectral methods  
steepest descent method  
strain energy methods  
traveling solvent method  
Van Slyke method  
von Zeipel method  
vortex in cell technique  
Wentzel-Kramer-Brillouin method  
wing flow method tests

### *methods*

USE **methodology**  
**procedures**

### **methoxy systems**

RT alcohols  
∞ chemical compounds  
indoles  
organic chemistry  
organic compounds  
pyrroles  
∞ systems

### **methyl alcohol**

UF *methanol*  
GS hydroxyl compounds  
. alcohols  
. . **methyl alcohol**  
RT Karl Fischer reagent

### **methyl chloride**

GS drugs  
. anesthetics  
. . **methyl chloride**  
RT chlorides

### **methyl chlorosilanes**

GS hydrogen compounds  
. hydrides  
. . silanes  
. . . **methyl chlorosilanes**  
methyl compounds  
. **methyl chlorosilanes**  
silicon compounds  
. silanes  
. . **methyl chlorosilanes**

### **methyl compounds**

GS **methyl compounds**  
. acetonitrile  
. methyl chlorosilanes

. methyl nitrate  
 . methyl polysiloxanes  
 RT  $\infty$  chemical compounds  
 dimethyl compounds  
 organic compounds  
 trimethyl compounds

*methyl cyanide*  
 USE **acetonitrile**

**methyl nitrate**  
 GS alkyl compounds  
 . **methyl nitrate**  
 methyl compounds  
 . **methyl nitrate**  
 nitrogen compounds  
 . nitrates  
 . . **methyl nitrate**

**methyl polysiloxanes**  
 GS methyl compounds  
 . **methyl polysiloxanes**  
 silicon polymers  
 . silicones  
 . . polysiloxanes  
 . . . **methyl polysiloxanes**  
 RT  $\infty$  polymers  
 silicon compounds

**methylation**  
 GS chemical reactions  
 . **methylation**  
 RT alkylation

**methylene**  
 GS organic compounds  
 . hydrocarbons  
 . . **methylene**  
 RT dyes  
 staining

**methylene blue**  
 GS dyes  
 . **methylene blue**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . azines  
 . . . . **methylene blue**  
 pyrazines  
 . azines  
 . . **methylene blue**  
 RT chemical analysis  
 chemical indicators  
 $\infty$  indicators  
 staining

**methylene diamine**  
 GS organic compounds  
 . amines  
 . . **methylene diamine**

**methylhydrazine**  
 GS hydrazines  
 . **methylhydrazine**  
 . . monomethylhydrazines  
 RT dimethylhydrazines

**methylidyne**  
 (*added June 1993*)  
 UF *CH (methylidyne)*  
*methenyl*  
 GS organic compounds  
 . hydrocarbons  
 . . **methylidyne**  
 radicals  
 . **methylidyne**  
 RT  $\infty$  aromatic compounds  
 carbon compounds  
 diatomic molecules  
 interstellar gas  
 interstellar matter  
 molecular clouds

**Metis**  
 (*added January 1996*)  
 DEF A natural satellite of Jupiter orbiting at a mean distance of 127,960 kilometers.  
 GS celestial bodies  
 . natural satellites

. . . Jupiter satellites  
 . . . **Metis**  
 RT Jupiter (planet)

*metric conversion*  
 USE **metrication**

**metric photography**  
 DEF The recording of events by means of photography (either singly or sequentially), together with appropriate metric coordinates to form the basis for accurate measurements.  
 GS imagery  
 . photography  
 . . **metric photography**

**metric space**  
 GS geometry  
 . topology  
 . . **metric space**  
 . . . Hilbert space  
 . . . . Sobolev space  
 RT Banach space  
 bimetric theories

*metric system*  
 USE **International System of Units**

**metrication**  
 DEF The conversion on an industry and/or nationwide basis of English units of measurement into the International System of Units, including engineering and manufacturing standards, tools and instruments, and all affected areas in the government and private sectors. Used for metric conversion.  
 UF *metric conversion*  
 RT  $\infty$  conversion  
 International System of Units  
 metrology  
 standardization  
 units of measurement

**metrology**  
 DEF The science of dimensional measurement; sometimes includes the science of weighing.  
 RT International System of Units  
 $\infty$  measurement  
 measuring instruments  
 metrication  
 standards  
 units of measurement

*Metropolitan aircraft*  
 USE **CV-440 aircraft**

*metropolitan areas*  
 USE **cities**

**Mexican space program**  
 (*added March 1989*)  
 GS programs  
 . space programs  
 . . **Mexican space program**  
 RT Mexico

**Mexico**  
 GS nations  
 . **Mexico**  
 RT Colorado River (North America)  
 Gulf of California (Mexico)  
 Gulf of Mexico  
 Imperial Valley (CA)  
 Lower California (Mexico)  
 Mexican space program  
 North America  
 Rio Grande (North America)  
 San Andreas Fault

Southern California

*MFM (microscopy)*  
 (*added June 2004*)  
 USE **magnetic force microscopy**

*MGCO*  
 USE **Mars Observer**

*MGS (spacecraft)*  
 (*added March 1999*)  
 USE **Mars Global Surveyor**

**MH-262 aircraft**  
 UF *Max Holste MH-262 aircraft*  
*Nord 262 aircraft*  
 GS jet aircraft  
 . turboprop aircraft  
 . . **MH-262 aircraft**  
 light aircraft  
 . **MH-262 aircraft**  
 monoplanes  
 . **MH-262 aircraft**  
 Nord aircraft  
 . **MH-262 aircraft**  
 transport aircraft  
 . **MH-262 aircraft**  
 RT  $\infty$  aircraft  
 cargo aircraft  
 passenger aircraft

**mica**  
 UF *fluoromica*  
 GS minerals  
 . **mica**  
 . . biotite  
 . . fluorophlogopite  
 . . muscovite  
 RT igneous rocks  
 vermiculite

**micarta**  
 GS composite materials  
 . polymer matrix composites  
 . . reinforced plastics  
 . . . **micarta**  
 plastics  
 . reinforced plastics  
 . . **micarta**  
 . . synthetic resins  
 . . thermosetting resins  
 . . . phenolic resins  
 . . . . **micarta**  
 resins  
 . synthetic resins  
 . . thermosetting resins  
 . . . phenolic resins  
 . . . . **micarta**  
 RT fabrics  
 fiber composites  
 insulation  
 $\infty$  polymers

**mice**  
 GS animals  
 . vertebrates  
 . . mammals  
 . . . rodents  
 . . . . **mice**  
 . . . . . jerboas  
 . . . . . knockout mice  
 . . . . . pocket mice  
 RT animal models  
 rats

**micelles**  
 (*added June 2001*)  
 DEF Electrically charged colloidal particles or ions consisting of oriented molecules; aggregates of a number of molecules held loosely together by secondary bonds.  
 GS molecular clusters  
 . **micelles**  
 RT agglomeration  
 aggregates  
 block copolymers  
 $\infty$  clusters  
 colloids  
 flocculating  
 nanostructure (characteristics)

## Michael reaction

self assembly

### Michael reaction

GS chemical reactions  
. **Michael reaction**

### Michaelis theory

RT  $\infty$  theories

### Michell theorem

GS theorems  
. **Michell theorem**  
RT stress analysis  
structural analysis

### Michelson interferometers

GS measuring instruments  
. interferometers  
. . **Michelson interferometers**  
RT astrophysics  
radio astronomy  
spectrometers

### Michigan

GS nations  
. United States  
. . **Michigan**  
RT Pontiac (MI)  
Saginaw Bay (MI)

### microanalysis

GS chemical tests  
. chemical analysis  
. . **microanalysis**  
RT electron microscopes  
electron microscopy  
electrophotometry  
inductively coupled plasma mass spectrometry  
lab-on-a-chip devices  
mass spectrometers  
 $\infty$  materials tests  
neutron activation analysis  
qualitative analysis  
quantitative analysis  
scanning electron microscopy  
spectroscopic analysis  
transmission electron microscopy  
x ray analysis

### microbalances

UF *microscapes*  
GS measuring instruments  
. indicating instruments  
. . weight indicators  
. . . **microbalances**

### microballoons

DEF Very small glass spheres (50 to 100 micrometers in diameter) used as targets in the laser fusion programs.

GS expandable structures  
. inflatable structures  
. . balloons  
. . . **microballoons**  
RT globules  
lasers  
spheres  
targets

### microbe

USE **microorganisms**

### microbeams

GS beams (radiation)  
. **microbeams**  
RT collimation  
crystallography  
x ray analysis

### microbiology

GS **microbiology**  
. bacteriology  
RT  $\infty$  biology  
cell culturing  
culture media  
culture techniques  
cultured cells  
gnotobiotics  
organ culturing

tissue culturing

### microbursts (meteorology)

SN (EXCLUDES IONOSPHERIC RADIATION MICROBURSTS)  
DEF A strong, localized downdraft that strikes the ground creating an outflow of severe winds near the ground that diverge radically from the impact point.  
GS meteorology  
. micrometeorology  
. . **microbursts (meteorology)**  
storms  
. storms (meteorology)  
. . downbursts  
. . . **microbursts (meteorology)**  
RT aviation meteorology  
flight hazards  
thunderstorms  
vertical air currents  
wind shear

### microcalorimeters

USE **calorimeters**

### microchannel plates

DEF An array of microchannels formed into plates and contained in a photomultiplier tube. Used for multichannel plates.  
UF *multichannel plates*  
RT channel multipliers  
dynamic range  
integrated circuits  
microchannels  
microwave equipment  
photomultiplier tubes  
 $\infty$  plates  
thin films

### microchannels

RT frequencies  
image converters  
light amplifiers  
microchannel plates  
multi-anode microchannel arrays  
night vision  
optical equipment  
photocathodes  
ultraviolet radiation

### microcircuits

USE **microelectronics**

### microclimatology

GS climatology  
. **microclimatology**  
RT agroclimatology  
biometeorology  
micrometeorology

### microcomputers

DEF Complete digital computers utilizing a microprocessor consisting of one or more integrated circuit chips as the central arithmetic and logic unit, and added chips to provide timing, program memory, random access memory interfaces for input and output signals and other functions. Some microcomputers consist of a single integrated-circuit chip.

GS data processing equipment  
. computers  
. . digital computers  
. . . **microcomputers**  
. . . . personal computers  
. . . . IBM personal computers  
. . . . Macintosh personal computers  
RT microprocessors  
minicomputers

### microcracks

GS fractures (materials)  
. cracks  
. . **microcracks**  
RT crack closure  
crack geometry  
crack initiation  
Elber equation  
surface cracks

### microcrystals

GS crystals

. **microcrystals**

RT crystallites  
nanocrystals  
spherulites

### Microcystis

GS plants (botany)  
. algae  
. . blue green algae  
. . . **Microcystis**  
. thermophilic plants  
. . blue green algae  
. . . **Microcystis**  
RT pollution

### microdensitometers

DEF Image analysis devices for resolving gray-level differences within or between features and for integrating the optical density across scanned images of irregularly shaped objects.  
GS measuring instruments  
. densitometers  
. . **microdensitometers**  
. optical measuring instruments  
. . **microdensitometers**  
optical equipment  
. optical measuring instruments  
. . **microdensitometers**  
RT gravimeters  
optical density  
optical measurement  
photometers

### microelectromechanical systems

(added October 1998)  
UF *MEMS (electromechanical devices)*  
GS electromechanical devices  
. **microelectromechanical systems**  
. . lab-on-a-chip devices  
. . microoptoelectromechanical systems  
RT electroactive polymers  
microfluidic devices  
microinstrumentation  
microminiaturization  
microminiaturized electronic devices  
microsatellites  
nanosatellites  
nanotechnology  
piezoelectric actuators  
piezoelectric motors

### microelectronics

UF *microcircuits*  
GS **microelectronics**  
. large scale integration  
. medium scale integration  
. very large scale integration  
RT beam leads  
chips (electronics)  
circuits  
 $\infty$  electronics  
encapsulated microcircuits  
ion implantation  
laser microscopy  
microinstrumentation  
microminiaturization  
microminiaturized electronic devices  
micromodules  
microoptoelectromechanical systems  
molecular electronics  
nanotechnology  
photolithography  
photomasks  
photoresists  
single event upsets  
systems-on-a-chip  
transistor circuits  
wafers

### microfibers

GS fibers  
. **microfibers**

### microfilms

GS photographic film  
. **microfilms**  
RT data retrieval  
data storage  
microphotographs

- readers  
reproduction (copying)
- microfluidic devices**  
(added October 2003)  
DEF Various devices that incorporate one or more micro-scale fluid channels where measurements, analysis, reactions, and separations occur. Often applied in systems for chemical analysis, biochemical sensing, and cytometry.  
GS **microfluidic devices**  
. lab-on-a-chip devices  
RT fluidic circuits  
fluidics  
microelectromechanical systems  
microinstrumentation
- micrography*  
USE **photomicrography**
- microgravity**  
DEF A condition in which the acceleration acting on a body is less than normal gravity, between 0 and 1 g. Used for low gravity, reduced gravity, and subgravity.  
UF *hypogravity*  
*low gravity*  
*reduced gravity*  
*subgravity*  
GS gravitation  
. **microgravity**  
RT antigravity  
bioprocessing  
clinorotation  
clinostats  
drop towers  
Earth orbital environments  
fluid management  
high gravity environments  
low gravity manufacturing  
low weight  
Marangoni convection  
∞ microgravity applications  
space processing  
thermocapillary migration  
weightlessness
- ∞ **microgravity applications**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
RT bioprocessing  
commerce lab  
crystal growth  
electrophoresis  
low gravity manufacturing  
microgravity  
space commercialization  
space manufacturing  
space processing  
surface tension driven convection  
tissue engineering
- microhardness**  
UF *microindentation*  
GS mechanical properties  
. hardness  
. . . **microhardness**  
. . . Knoop hardness  
RT nanoindentation  
Rockwell hardness
- microindentation*  
USE **microhardness**
- microinstrumentation**  
RT measuring instruments  
microelectromechanical systems  
microelectronics  
microfluidic devices  
microminiaturization
- micromachining**  
(added September 1993)  
DEF Performing various microscopic scale cutting or grinding operations on a piece of work.  
GS machining  
. **micromachining**  
RT cutting  
drilling  
grinding (material removal)
- grooving  
laser cutting  
laser drilling  
metal cutting  
metal working  
micromechanics  
microstructure  
photoengraving  
photomasks  
photomechanical effect  
surface finishing  
V grooves
- micromanometers*  
USE **manometers**
- micromechanics**  
DEF The study of the constraints, the grain size, and their interrelationship in materials.  
RT composite materials  
crack propagation  
fracture mechanics  
mechanical properties  
mechanics (physics)  
micromachining  
microoptoelectromechanical systems  
microstructure  
reinforcing fibers  
stress concentration
- micrometeorites**  
DEF Very small meteorites or meteoritic particles with a diameter in general less than a millimeter.  
GS celestial bodies  
. meteorites  
. . . **micrometeorites**  
RT cosmic dust  
hypervelocity projectiles  
meteoroids  
micrometeoroids  
space weathering  
tektites  
zodiacal dust
- Micrometeoroid Explorer satellites**  
GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . **Micrometeoroid Explorer satellites**
- micrometeoroids**  
UF *meteoritic dust*  
*micrometeors*  
GS celestial bodies  
. meteoroids  
. . . **micrometeoroids**  
. . . meteoroid dust clouds  
. . . . zodiacal dust  
RT cosmic dust  
Explorer satellites  
interplanetary dust  
meteor trails  
meteorites  
micrometeorites  
Poynting-Robertson effect  
space debris  
terrestrial dust belt  
zodiacal light
- micrometeorology**  
GS meteorology  
. **micrometeorology**  
. . microbursts (meteorology)  
RT agrometeorology  
mesometeorology  
microclimatology  
turbulence
- micrometeors*  
USE **micrometeoroids**
- micrometers**  
DEF Instruments for making precise linear measurements in which the displacements measured correspond to the travel of a screw of accurately known pitch.  
GS measuring instruments  
. **micrometers**
- RT dimensional measurement  
distance measuring equipment
- micromillimeters**  
GS measuring instruments  
. ammeters  
. . . **micromillimeters**  
RT electric current  
electrical measurement  
galvanometers
- microminiaturization**  
GS miniaturization  
. **microminiaturization**  
RT circuits  
DTL integrated circuits  
integrated circuits  
lab-on-a-chip devices  
large scale integration  
linear integrated circuits  
microelectromechanical systems  
microelectronics  
microinstrumentation  
microminiaturized electronic devices  
microsatellites  
miniature electronic equipment  
molecular electronics  
nanosatellites  
semiconductor devices  
subminiaturization  
thick films  
thin films  
TTL integrated circuits  
wafers
- microminiaturized electronic devices**  
GS **microminiaturized electronic devices**  
. micromodules  
RT microelectromechanical systems  
microelectronics  
microminiaturization  
microsatellites  
miniature electronic equipment  
nanosatellites  
systems-on-a-chip
- micromodules**  
GS electronic equipment  
. electronic modules  
. . . **micromodules**  
microminiaturized electronic devices  
. **micromodules**  
modules  
. electronic modules  
. . . **micromodules**  
RT beam leads  
∞ containers  
electronic packaging  
microelectronics  
microprocessors  
miniature electronic equipment  
photolithography
- micromotors**  
SN (EXCLUDES ROCKET ENGINES)  
GS electromechanical devices  
. electric motors  
. . . **micromotors**  
motors  
. electric motors  
. . . **micromotors**  
RT piezoelectric motors
- microoptoelectromechanical systems**  
(added December 2005)  
DEF Integrated, hybrid micro-systems that include mechanical structures, microelectronics, and optics, and allow the dynamic manipulation of light beams for applications such as optical switches, tunable filters and lasers, displays, and specialized sensors.  
UF **MOEMS**  
*optical MEMS*  
GS electromechanical devices  
. microelectromechanical systems  
. . . **microoptoelectromechanical systems**  
RT actuators  
microelectronics

## microorganisms

micromechanics  
optoelectronic devices  
∞ sensors  
systems-on-a-chip

### microorganisms

UF *microbe*  
GS **microorganisms**  
. bacteria  
. . . actinomycetes  
. . . archaeobacteria  
. . . Azotobacter  
. . . Bacillus  
. . . . . stearothermophilus  
. . . Clostridium  
. . . Clostridium botulinum  
. . . Escherichia  
. . . hydrogenomonas  
. . . Klebsiella  
. . . nitrobacter  
. . . pseudomonas  
. . . salmonella  
. . . sarcina  
. . . serratia  
. . . staphylococcus  
. . . streptococcus  
. . . streptomycetes  
. . . protozoa  
. . . amoeba  
. . . . . pelomyxa  
. . . Flagellata  
. . . . . Euglena  
. . . . . trypanosome  
. . . . . paramecia  
. . . Rotifera  
. . . viruses  
. . . . . adenoviruses  
. . . . . bacteriophages  
. . . . . human immunodeficiency virus  
RT aerobes  
algae  
anaerobes  
animals  
antibiotics  
biofilms  
gnotobiotics  
invertebrates  
mesophiles  
microparticles  
microspores  
plants (botany)  
pollution  
psychrophiles  
red tide  
saprophytes  
spores  
virulence

### microparticles

GS particles  
. **microparticles**  
RT condensation nuclei  
ferrofluids  
microorganisms  
particulate reinforced composites

### microphones

DEF Electroacoustic transducers which receive acoustic signals and deliver corresponding electric signals.  
GS audio equipment  
. **microphones**  
transducers  
. sound transducers  
. . . electroacoustic transducers  
. . . . **microphones**  
RT hydrophones  
interphones  
magnetic transducers  
monaural signals  
transmitters  
ultrasonic wave transducers

### microphotographs

GS photographs  
. **microphotographs**  
RT data storage  
microfilms  
photography

photomasks

### microphotometers

USE **photometers**

### microplasmas

GS particles  
. charged particles  
. . . energetic particles  
. . . . . plasmas (physics)  
. . . . . **microplasmas**  
. . . corpuscular radiation  
. . . energetic particles  
. . . . . plasmas (physics)  
. . . . . **microplasmas**

### micropolar fluids

GS incompressible fluids  
. **micropolar fluids**  
RT fluid mechanics  
∞ fluids  
microstructure

### microporosity

GS porosity  
. **microporosity**  
RT mechanical properties  
metallography  
microstructure

### microprocessors

GS computer components  
. **microprocessors**  
. . . Intel 8080 microprocessor  
data processing equipment  
. **microprocessors**  
. . . Intel 8080 microprocessor  
RT central processing units  
chips (electronics)  
computer design  
computer storage devices  
computer techniques  
data processing  
distributed processing  
firmware  
integrated circuits  
large scale integration  
microcomputers  
micromodules  
onboard data processing  
transputers

### microprogramming

GS computer programming  
. **microprogramming**  
RT firmware  
∞ programming

### micropulsations

GS pulses  
. **micropulsations**  
. . . geomagnetic micropulsations  
RT variations

### microrocket engines

GS engines  
. rocket engines  
. . . **microrocket engines**  
. . . . . Orbit Maneuvering Engine (Space Shuttle)  
RT electric rocket engines  
electrostatic engines  
microthrust  
Vernier engines

### microsatellites

(added October 1998)  
DEF Satellites with a total mass between 10 and 100 kg often incorporating miniaturized electronic and mechanical systems.  
UF *microsats*  
GS artificial satellites  
. **microsatellites**  
RT microelectromechanical systems  
microminiaturization  
microminiaturized electronic devices  
nanosatellites  
satellite constellations  
satellite design  
small satellite technology

small scientific satellites

### microsats

(added October 1998)

USE **microsatellites**

### microscales

USE **microbalances**

### microscopes

DEF Optical instruments capable of producing a magnified image of a small object.

GS **microscopes**  
. acoustic microscopes  
. electron microscopes  
. ion microscopes  
. optical microscopes

RT binoculars  
eyepieces  
metallography  
microscopy  
optical equipment  
optical measuring instruments  
photomicrography  
ultraviolet microscopy

### microscopy

DEF The science of the interpretive use and applications of microscopes.

GS **microscopy**  
. atomic force microscopy  
. electron microscopy  
. . . scanning electron microscopy  
. . . scanning tunneling microscopy  
. . . transmission electron microscopy  
. . . laser microscopy  
. . . magnetic force microscopy  
. . . photoacoustic microscopy  
. . . ultraviolet microscopy

RT cytometry  
microscopes  
microtomy  
phase contrast  
photomicrography  
slides (microscopy)

### microseisms

DEF Seismic pulses of short duration and low amplitude, often occurring previous to failure of a material or structures.

GS elastic waves  
. seismic waves  
. . . **microseisms**  
RT crustal fractures  
earthquake damage  
earthquakes

### microsonics

GS acoustics  
. **microsonics**  
RT elastic properties  
piezoelectric crystals  
sound fields  
sound waves  
surface acoustic wave devices  
surface waves

### microspores

GS spores  
. **microspores**  
RT fungi  
microorganisms  
plants (botany)  
protozoa

### microstrip antennas

DEF Antennas which consist of thin metallic conductors bonded to thin grounded dielectric substrates. The metallic conductors generally have some regular shape, for example, rectangular, circular, or elliptical. Feeding is often by means of a coaxial probe or a microstrip transmission line.

GS antennas  
. **microstrip antennas**  
microstrip devices  
. **microstrip antennas**  
RT antenna design  
microstrip transmission lines  
microwave antennas

- patch antennas
- waveguide antennas
- microstrip devices**
  - GS **microstrip devices**
    - . microstrip antennas
    - . microstrip transmission lines
  - RT circuits
    - integrated circuits
    - microwave circuits
    - microwave equipment
- microstrip transmission lines**
  - UF *flat coaxial transmission lines*
    - parallel strip lines*
  - GS microstrip devices
    - . **microstrip transmission lines**
    - transmission lines
      - . strip transmission lines
      - . . **microstrip transmission lines**
  - RT directional couplers
    - microstrip antennas
    - microwave transmission
- microstructure**
  - GS **microstructure**
    - . meteoritic microstructures
    - . nanostructure (characteristics)
    - . Widmanstatten structure
  - RT aging (materials)
    - aging (metallurgy)
    - antiphase boundaries
    - atomic force microscopy
    - austenite
    - bainite
    - Bauschinger effect
    - cast alloys
    - casting
    - castings
    - cementite
    - crystal structure
    - crystallography
    - ferrites
    - grain size
    - hardening (materials)
    - heat treatment
    - kink bands
    - lamella (metallurgy)
    - Laves phases
    - martensite
    - metallography
    - micromachining
    - micromechanics
    - micropolar fluids
    - microporosity
    - molecular dynamics
    - order-disorder transformations
    - Ostwald ripening
    - pearlite
    - photomicrography
    - precipitates
    - quenching (cooling)
    - shape memory alloys
    - silicon alloys
    - spherulites
    - ∞ structures
    - thermomechanical treatment
    - vanadium alloys
    - work softening
- microthrust**
  - SN (NOT USED FOR GEOLOGICAL FAULTS, SEISMOLOGY, OR TECTONICS)
  - GS thrust
    - . low thrust
    - . . **microthrust**
  - RT jet thrust
    - low thrust propulsion
    - microrocket engines
    - rocket thrust
    - variable thrust
- microtomy**
  - RT medical equipment
    - microscopy
- microtrons**
  - GS particle accelerators
    - . cyclotrons
    - . . **microtrons**
- RT betatrons
  - synchrotrons
- microvision landing aid**
  - GS display devices
    - . **microvision landing aid**
    - landing aids
    - . **microvision landing aid**
- microwave absorption**
  - (added August 1991)
  - DEF The absorption of electromagnetic radiation in the microwave frequency range.
  - GS energy absorption
    - . radiation absorption
    - . . electromagnetic absorption
    - . . . **microwave absorption**
  - RT absorptance
    - ∞ absorption
    - absorption spectra
    - absorptivity
    - activation
    - atmospheric attenuation
    - microwave attenuation
    - microwave frequencies
    - microwave scattering
    - microwave transmission
    - microwaves
    - radar
    - radar absorbers
- microwave amplifiers**
  - GS amplifiers
    - . **microwave amplifiers**
    - . . crossed field amplifiers
    - . . cyclotron resonance devices
    - . . planotrons
    - microwave equipment
    - . **microwave amplifiers**
    - . . crossed field amplifiers
    - . . cyclotron resonance devices
    - . . planotrons
  - RT interstellar masers
    - masers
    - parametric amplifiers
    - transferred electron devices
- Microwave Anisotropy Probe**
  - (added November 2002)
  - DEF Spacecraft and related mission to map the relative cosmic microwave background temperature over the full sky with a high angular resolution and sensitivity. Launched June 2001.
  - UF *MAP (space probe)*
  - GS unmanned spacecraft
    - . space probes
    - . . **Microwave Anisotropy Probe**
  - RT cosmic microwave background
    - radiation
    - relic radiation
    - spaceborne astronomy
- microwave antennas**
  - GS antennas
    - . radio antennas
    - . . **microwave antennas**
    - . . . horn antennas
    - . . . lens antennas
    - . . . rectennas
    - . . . spacetennas
    - microwave equipment
    - . **microwave antennas**
    - . . horn antennas
    - . . lens antennas
    - . . rectennas
    - . . spacetennas
    - radio equipment
    - . radio antennas
    - . . **microwave antennas**
    - . . . horn antennas
    - . . . lens antennas
    - . . . rectennas
    - . . . spacetennas
  - RT aircraft antennas
    - antenna arrays
    - backfire antennas
    - directional antennas
    - Gregorian antennas
    - helical antennas
    - microstrip antennas
- missile antennas
- multibeam antennas
- omnidirectional antennas
- parabolic antennas
- parabolic reflectors
- patch antennas
- radar antennas
- reflector antennas
- slot antennas
- waveguide antennas
- microwave attenuation**
  - GS attenuation
    - . **microwave attenuation**
    - transmission
      - . electromagnetic wave transmission
      - . . **microwave attenuation**
      - . signal transmission
      - . . **microwave attenuation**
  - RT microwave absorption
    - wave propagation
- microwave circuits**
  - GS circuits
    - . **microwave circuits**
  - RT microstrip devices
- microwave coupling**
  - GS coupling
    - . electromagnetic coupling
    - . . **microwave coupling**
  - RT antenna couplers
    - coupling circuits
    - cross coupling
    - directional antennas
    - directional couplers
    - optical coupling
- microwave emission**
  - GS electromagnetic radiation
    - . radio waves
    - . . short wave radiation
    - . . . microwaves
    - . . . **microwave emission**
    - emission
    - . **microwave emission**
  - RT cosmic noise
    - diffraction radiation
    - extraterrestrial radiation
    - extraterrestrial radio waves
    - linear polarization
    - microwave signatures
    - stellar radiation
- microwave equipment**
  - GS **microwave equipment**
    - . gyrators
    - . . microwave filters
    - . . microwave amplifiers
    - . . crossed field amplifiers
    - . . cyclotron resonance devices
    - . . planotrons
    - . microwave antennas
    - . . horn antennas
    - . . lens antennas
    - . . rectennas
    - . . spacetennas
    - . microwave interferometers
    - . microwave oscillators
    - . . magnetrons
    - . . . nigotrons
    - . microwave probes
    - . . microwave plasma probes
    - . microwave radiometers
    - . . Advanced Microwave Sounding Unit
      - . microwave scanning beam landing system
    - . microwave tubes
    - . . telescopes
    - . . cyclotron resonance devices
    - . . klystrons
    - . . magnetrons
    - . . . nigotrons
    - . . planotrons
    - . . traveling wave tubes
    - . . . backward wave tubes
    - . . . . helitrons
    - . . . carcinotrons
    - . . thyratrons



## microwave filters

RT gas discharge tubes  
microchannel plates  
microstrip devices

### microwave filters

GS electromagnetic wave filters  
. electric filters  
. . **microwave filters**  
microwave equipment  
. gyrators  
. . **microwave filters**

RT bandpass filters  
bandstop filters  
digital filters  
FIR filters  
high pass filters  
low pass filters  
radar filters  
radio filters  
rectangular waveguides  
tunable filters  
waveguide filters

### microwave frequencies

SN (1 TO 100 GHz)  
GS frequencies  
. radio frequencies  
. . **microwave frequencies**  
. . . C band  
. . . extremely high frequencies  
. . . P band  
. . . superhigh frequencies

RT acoustic microscopes  
centimeter waves  
microwave absorption  
microwaves  
passive L-band radiometers  
praetersonic devices

### microwave holography

GS imagery  
. photography  
. . holography  
. . . **microwave holography**

RT imaging techniques  
microwaves  
wave front reconstruction

### microwave imagery

GS imagery  
. **microwave imagery**

RT radarscopes  
synthetic aperture radar  
x ray imagery

### microwave interferometers

GS measuring instruments  
. interferometers  
. . **microwave interferometers**  
microwave equipment  
. **microwave interferometers**

RT Fabry-Perot interferometers  
plasma diagnostics

### microwave landing systems

DEF A precision instrument approach landing system operating in the microwave spectrum which provides lateral and vertical guidance to aircraft having compatible avionics equipment.

GS landing aids  
. **microwave landing systems**  
. . microwave scanning beam landing system

RT air traffic control  
aircraft landing  
aircraft safety  
approach control  
automated en route ATC  
automatic landing control  
∞ systems

### microwave oscillators

GS microwave equipment  
. **microwave oscillators**  
. . magnetrons  
. . . nigostrons  
oscillators  
. **microwave oscillators**  
. . magnetrons  
. . . nigostrons

RT backward wave tubes  
Barritt diodes  
diffraction radiation  
gas discharge tubes  
klystrons  
microwave tubes  
superconducting cavity resonators  
transferred electron devices  
traveling wave tubes  
vacuum tube oscillators  
voltage controlled oscillators

### microwave photography

GS imagery  
. photography  
. . **microwave photography**

RT radar data  
radar photography  
radarscopes

### microwave plasma probes

GS measuring instruments  
. microwave probes  
. . **microwave plasma probes**  
microwave equipment  
. microwave probes  
. . **microwave plasma probes**

RT electron probes  
plasma flux measurement  
plasmaguides  
plasmas (physics)  
resonance probes

### microwave power beaming

(added November 1989)  
UF *power transmission (microwave)*  
GS power beaming  
. **microwave power beaming**

RT laser power beaming  
microwave transmission  
satellite power transmission  
spacecraft power supplies

### microwave probes

GS measuring instruments  
. **microwave probes**  
. . microwave plasma probes  
microwave equipment  
. **microwave probes**  
. . microwave plasma probes

RT radio frequency impedance probes

### microwave radiation

USE **microwaves**

### microwave radiometers

GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . radiometers  
. . . . **microwave radiometers**  
. . . . . Advanced Microwave Sounding Unit  
microwave equipment  
. **microwave radiometers**  
. . Advanced Microwave Sounding Unit

### microwave reflectometers

GS measuring instruments  
. optical measuring instruments  
. . reflectometers  
. . . **microwave reflectometers**  
optical equipment  
. optical measuring instruments  
. . reflectometers  
. . . **microwave reflectometers**

RT kinematics

### microwave resonance

GS resonance  
. **microwave resonance**

RT cavity resonators  
harmonic analysis  
nonresonance

### microwave scanning beam landing system

DEF Primary position sensor of Space Shuttle orbiter's navigation system during the autoland phase of the flight. Used for MSBLS.

UF *MSBLS*  
GS landing aids  
. microwave landing systems  
. . **microwave scanning beam landing system**  
microwave equipment  
. **microwave scanning beam landing system**  
navigation aids  
. **microwave scanning beam landing system**

RT approach indicators  
Space Shuttle orbiters  
∞ systems

### microwave scattering

GS scattering  
. radio scattering  
. . **microwave scattering**  
. wave scattering  
. . electromagnetic scattering  
. . . **microwave scattering**

RT atmospheric scattering  
microwave absorption  
microwave signatures  
scatterometers  
Sunyaev-Zeldovich effect

### microwave sensors

GS measuring instruments  
. **microwave sensors**  
. . Advanced Microwave Sounding Unit

RT ∞ instruments  
radar receivers  
∞ sensors  
signal detectors  
synthetic aperture radar

### microwave signatures

(added September 1988)  
GS signatures  
. spectral signatures  
. . **microwave signatures**

RT backscattering  
microwave emission  
microwave scattering  
microwaves  
radar signatures  
signature analysis

### microwave sounding

GS sounding  
. **microwave sounding**

RT Advanced Microwave Sounding Unit  
imagery  
microwaves  
NOAA 12 satellite  
rocket sounding

### microwave spectra

UF *interstellar microwave spectra*  
GS spectra  
. radiation spectra  
. . electromagnetic spectra  
. . . radio spectra  
. . . . **microwave spectra**

RT absorption spectra  
infrared spectra  
molecular rotation  
molecular spectra  
molecular spectroscopy

### microwave spectrometers

GS measuring instruments  
. spectrometers  
. . **microwave spectrometers**

### microwave switching

GS switching  
. **microwave switching**

RT ferroelectricity  
gyrators  
packet switching  
phase shift  
switching circuits  
waveguides

### microwave transmission

GS transmission

- . electromagnetic wave transmission
- . . . radio transmission
- . . . . **microwave transmission**
- . signal transmission
- . . . radio transmission
- . . . . **microwave transmission**
- RT ACTS
- circular waveguides
- dielectric waveguides
- domestic satellite communications systems
- downlinking
- Fleet Satellite Communication System
- frequency reuse
- laser power beaming
- microstrip transmission lines
- microwave absorption
- microwave power beaming
- power beaming
- satellite solar energy conversion
- satellite solar power stations
- spacetennas
- teletypewriter systems
- uplinking
- VSAT (network)
- wave propagation
- waveguides
- microwave tubes**
- GS electron tubes
- . vacuum tubes
- . . . **microwave tubes**
- . . . . telescopes
- . . . . cyclotron resonance devices
- . . . . klystrons
- . . . . magnetrons
- . . . . . nigotrons
- . . . . planotrons
- . . . . traveling wave tubes
- . . . . backward wave tubes
- . . . . . helitrons
- . . . . . carcinotrons
- microwave equipment
- . **microwave tubes**
- . . telescopes
- . . cyclotron resonance devices
- . . klystrons
- . . magnetrons
- . . nigotrons
- . . planotrons
- . . traveling wave tubes
- . . backward wave tubes
- . . . . helitrons
- . . . . carcinotrons
- RT diffraction radiation
- gas discharge tubes
- microwave oscillators
- oscillators
- photomultiplier tubes
- phototubes
- triodes
- ∞ tubes
- microwaves**
- DEF Of, or pertaining to, radiation in the microwave region. Used for microwave radiation.
- UF *microwave radiation*
- GS electromagnetic radiation
- . radio waves
- . . short wave radiation
- . . . **microwaves**
- . . . . centimeter waves
- . . . . cosmic microwave background radiation
- . . . . . decimeter waves
- . . . . . microwave emission
- . . . . . millimeter waves
- RT cosmic noise
- diffraction radiation
- electromagnetic noise
- extraterrestrial radio waves
- infrared radiation
- microwave absorption
- microwave frequencies
- microwave holography
- microwave signatures
- microwave sounding
- ∞ radiation
- satellite solar energy conversion
- satellite solar power stations
- scatterometers
- submillimeter waves
- whistlers
- microweighing*
- USE **weight measurement**
- microyield strength**
- DEF Stress at which a microstructure (single crystal, for example) exhibits a specified deviation in its stress-strain relationship.
- GS mechanical properties
- . yield strength
- . . **microyield strength**
- RT elastic properties
- ∞ strength
- stresses
- yield point
- micturition*
- USE **urination**
- midair collisions**
- GS collisions
- . **midair collisions**
- . . bird-aircraft collisions
- RT air traffic control
- aircraft accidents
- aircraft hazards
- aircraft safety
- Beacon Collision Avoidance System
- collision avoidance
- crashes
- flight hazards
- flight safety
- pilot error
- threat evaluation
- midaltitude**
- DEF The average of many measurements of altitudes as with satellite instruments for the compiling of planetary maps.
- GS altitude
- . **midaltitude**
- RT flight altitude
- high altitude
- low altitude
- Midas 2 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 2 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 2 satellite**
- Midas 3 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 3 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 3 satellite**
- Midas 4 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 4 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 4 satellite**
- Midas 5 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 5 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 5 satellite**
- Midas 6 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 6 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 6 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 6 satellite**
- Midas 7 satellite**
- GS artificial satellites
- . Midas satellites
- . . **Midas 7 satellite**
- military spacecraft
- . reconnaissance spacecraft
- . . Midas satellites
- . . . **Midas 7 satellite**
- Midas satellites**
- GS artificial satellites
- . **Midas satellites**
- . . Midas 2 satellite
- . . Midas 3 satellite
- . . Midas 4 satellite
- . . Midas 5 satellite
- . . Midas 6 satellite
- . . Midas 7 satellite
- military spacecraft
- . reconnaissance spacecraft
- . . **Midas satellites**
- . . . Midas 2 satellite
- . . . Midas 3 satellite
- . . . Midas 4 satellite
- . . . Midas 5 satellite
- . . . Midas 6 satellite
- . . . Midas 7 satellite
- RT Atlas Agena B launch vehicle
- midcourse guidance**
- GS guidance (motion)
- . **midcourse guidance**
- RT command guidance
- inertial guidance
- injection guidance
- rendezvous guidance
- spacecraft guidance
- terminal guidance
- transearth injection
- translunar injection
- midcourse trajectories**
- GS trajectories
- . **midcourse trajectories**
- RT ascent trajectories
- ballistic trajectories
- coasting flight
- descent trajectories
- parabolic flight
- middle atmosphere**
- DEF The portion of the Earth's atmosphere extending from the troposphere to 100 kilometers.
- GS Earth atmosphere
- . **middle atmosphere**
- . . mesosphere
- . . . mesopause
- . . . stratosphere
- . . . ozonosphere
- . . . stratopause
- RT air
- air pollution
- ∞ atmospheres
- atmospheric chemistry
- atmospheric circulation
- atmospheric composition
- chemosphere
- climatology
- equatorial atmosphere
- free atmosphere
- heterosphere
- homosphere
- lower atmosphere
- midlatitude atmosphere
- tropopause
- upper atmosphere
- zonal flow (meteorology)
- middle ear**
- GS anatomy
- . sense organs
- . . ear
- . . . **middle ear**

## middle ear pressure

RT semicircular canals

### middle ear pressure

GS pressure  
. **middle ear pressure**  
RT ear pressure test  
eardrums

### Middle East

(added December 1995)  
GS regions  
. **Middle East**  
RT Africa  
Asia  
Europe

### midlatitude atmosphere

GS Earth atmosphere  
. **midlatitude atmosphere**  
environments  
. **midlatitude atmosphere**  
RT Earth ionosphere  
middle atmosphere  
sporadic E layer

### midlatitudes

USE **temperate regions**

### mid-ocean ridges

(added July 1992)  
DEF Continuous, seismic, median mountain ranges extending through the North and South Atlantic Oceans, the Indian Ocean and the South Pacific Ocean. They are broad fractured swells with a central rift valley and usually rugged topography. They are 1-3 km in elevation, about 1500 km in width, and over 84,000 km in length. According to the hypothesis of sea floor spreading, the mid-ocean ridges are the source of crustal material.

UF *mid-oceanic ridges*  
RT Atlantic Ocean  
geological faults  
Indian Ocean  
ocean bottom  
oceanography  
Pacific Ocean  
∞ ridges  
sea floor spreading  
seamounts  
seismology  
submarine hydrothermal vents

### mid-oceanic ridges

USE **mid-ocean ridges**

### Mie scattering

DEF Any scattering produced by spherical particles without special regard to comparative size of radiation wavelength and particle diameter. Used for Mie theory.

UF *Mie theory*  
GS scattering  
. wave scattering  
. . . electromagnetic scattering  
. . . **Mie scattering**  
. . . . Rayleigh scattering

### Mie theory

USE **Mie scattering**

### MiG aircraft

DEF Any of a series of Soviet fighter aircraft, fighter-bombers, interceptors, and air supremacy aircraft, designed by Mikoyan.

GS attack aircraft  
. fighter aircraft  
. . **MiG aircraft**  
single engine aircraft  
. **MiG aircraft**  
supersonic aircraft  
. **MiG aircraft**  
RT ∞ aircraft

### migration

RT behavior  
phenology

waterfowl

### Mil aircraft

RT ∞ aircraft

### Milankovitch theory

USE **climatology**

### military air facilities

UF *aircraft bases*  
RT air traffic control  
∞ aircraft  
aircraft carriers  
airports  
∞ facilities  
∞ fields  
hangars  
heliports  
landing aids  
landing mats  
navigation aids  
stations

### ∞ military aircraft

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT A-37 aircraft  
AH-1G helicopter  
AH-1S helicopter  
AH-1W helicopter  
AH-63 helicopter  
AH-64 helicopter  
∞ aircraft  
aircraft carriers  
aircraft survivability  
airships  
Alpha jet aircraft  
antisubmarine warfare aircraft  
armed forces  
armed forces (foreign)  
armed forces (United States)  
attack aircraft  
attacking (assaulting)  
AWACS aircraft  
B-1 aircraft  
B-2 aircraft  
bomber aircraft  
C-1A aircraft  
cargo aircraft  
CH-62 helicopter  
CL-600 challenger aircraft  
drone aircraft  
drone vehicles  
E-2 aircraft  
E-3A aircraft  
E-4A aircraft  
fighter aircraft  
Firebee 2 target drone aircraft  
FV-12A aircraft  
gliders  
ground effect machines  
H-60 Helicopter  
Harrier aircraft  
helicopters  
Jaguar aircraft  
jet aircraft  
light aircraft  
∞ military aviation  
military helicopters  
MRCA aircraft  
nuclear propelled aircraft  
observation aircraft  
passenger aircraft  
pilotless aircraft  
reconnaissance aircraft  
research aircraft  
rotary wing aircraft  
S-3 aircraft  
short takeoff aircraft  
SR-71 aircraft  
submersible aircraft  
tailless aircraft  
tanker aircraft  
target drone aircraft  
training aircraft  
transport aircraft  
unmanned aircraft systems  
utility aircraft  
V-22 aircraft

V/STOL aircraft  
vertical takeoff aircraft  
weapon systems  
X-45 aircraft  
YC-14 aircraft  
YF-12 aircraft

### ∞ military aviation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ∞ aeronautics  
air law  
armed forces  
aviation meteorology  
bomber aircraft  
fighter aircraft  
∞ military aircraft  
reconnaissance aircraft

### military compact reactors

UF *MCR reactors*  
GS nuclear reactors  
. liquid cooled reactors  
. . liquid metal cooled reactors  
. . . **military compact reactors**  
. nuclear research and test reactors  
. . **military compact reactors**

### military helicopters

GS V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . **military helicopters**  
. . . . AH-1G helicopter  
. . . . AH-1S helicopter  
. . . . AH-1W helicopter  
. . . . AH-63 helicopter  
. . . . AH-64 helicopter  
. . . . BO-105 helicopter  
. . . . CH-3 helicopter  
. . . . CH-21 helicopter  
. . . . CH-34 helicopter  
. . . . CH-46 helicopter  
. . . . CH-47 helicopter  
. . . . CH-54 helicopter  
. . . . CH-62 helicopter  
. . . . H-19 helicopter  
. . . . H-43 helicopter  
. . . . H-53 helicopter  
. . . . H-54 helicopter  
. . . . H-56 helicopter  
. . . . H-60 Helicopter  
. . . . HC-3 helicopter  
. . . . HH-43 helicopter  
. . . . HH-65 helicopter  
. . . . OH-4 helicopter  
. . . . OH-5 helicopter  
. . . . OH-6 helicopter  
. . . . OH-13 helicopter  
. . . . OH-23 helicopter  
. . . . OH-58 helicopter  
. . . . P-531 helicopter  
. . . . QH-50 helicopter  
. . . . S-67 helicopter  
. . . . SA-321 helicopter  
. . . . SA-330 helicopter  
. . . . SH-3 helicopter  
. . . . SH-4 helicopter  
. . . . Sikorsky Whirlwind helicopter  
. . . . UH-1 helicopter  
. . . . UH-2 helicopter  
. . . . UH-34 helicopter  
. . . . UH-60A helicopter  
. . . . UH-61A helicopter  
. . . . Westland Whirlwind helicopter  
. . . . XV-9A aircraft  
RT ∞ aircraft  
attack aircraft  
EH-101 helicopter  
light helicopters  
∞ military aircraft  
reconnaissance aircraft  
terrain following

### military operations

GS **military operations**  
. combat  
. electronic warfare  
RT deployment

- military personnel  
tactics  
tanks (combat vehicles)
- military personnel**  
(added June 2004)  
DEF Persons serving in any branch of the armed forces; members of a military force.  
GS personnel  
. **military personnel**  
RT military operations  
military psychology  
police
- military psychiatry*  
USE **military psychology**
- military psychology**  
UF *military psychiatry*  
GS psychology  
. **military psychology**  
RT aviation psychology  
military personnel  
psychiatry  
psychological effects  
psychological tests  
psychometrics  
space psychology
- military spacecraft**  
GS **military spacecraft**  
. DMSP satellites  
. reconnaissance spacecraft  
. . . Inspector satellite  
. . . Midas satellites  
. . . Midas 2 satellite  
. . . Midas 3 satellite  
. . . Midas 4 satellite  
. . . Midas 5 satellite  
. . . Midas 6 satellite  
. . . Midas 7 satellite  
. . . photo reconnaissance spacecraft  
. . . Samos  
. Vela satellites  
RT aerospace planes  
armed forces  
artificial satellites  
Columbus space station  
evasive satellites  
manned spacecraft  
meteorological satellites  
∞ military vehicles  
navigation satellites  
recoverable spacecraft  
rendezvous spacecraft  
satellite networks  
space stations  
space surveillance (spaceborne)  
∞ spacecraft  
synchronous satellites  
unmanned spacecraft  
weapon systems
- military technology**  
GS technologies  
. **military technology**  
RT antimissile defense  
antiradiation missiles  
antisubmarine warfare  
armed forces (foreign)  
armed forces (United States)  
Army-Navy instrumentation program  
AWACS aircraft  
Ballistic Missile Early Warning System  
defense communications system (DCS)  
defense industry  
defense program  
deployment  
Fleet Satellite Communication System  
interservice data exchange program  
laser weapons  
logistics over the shore (LOTS)  
carrier  
missile defense  
optical countermeasures  
radar homing missiles  
Safeguard system  
tactics  
weapons
- weapons delivery  
weapons industry
- ∞ **military vehicles**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aeroquatic vehicles  
aircraft carriers  
ambulances  
amphibious vehicles  
armed forces  
armed forces (foreign)  
armed forces (United States)  
automobiles  
boats  
military spacecraft  
recovery vehicles  
research vehicles  
ships  
submarines  
tanks (combat vehicles)  
trucks  
underwater vehicles  
∞ vehicles  
water vehicles
- milk**  
RT beverages  
∞ food
- Milky Way Galaxy**  
DEF The galaxy to which the sun belongs.  
GS celestial bodies  
. galaxies  
. . . spiral galaxies  
. . . **Milky Way Galaxy**  
RT galactic bulge  
local group (astronomy)  
massive compact halo objects  
Orion nebula  
radio sources (astronomy)  
solar neighborhood  
stars
- millet**  
GS farm crops  
. grains (food)  
. . . **millet**  
plants (botany)  
. **millet**  
RT Earth resources  
flour (food)  
∞ food  
grasses
- millimeter waves**  
GS electromagnetic radiation  
. radio waves  
. . . short wave radiation  
. . . microwaves  
. . . . **millimeter waves**  
RT beam plasma amplifiers  
C band  
CN emission  
cyclotron resonance devices  
decimeter waves  
electromagnetic noise  
extraterrestrial radio waves  
extremely high frequencies  
frequencies  
solar radio emission  
submillimeter waves  
wavelengths
- ∞ **milling**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT comminution  
compounding
- milling (machining)**  
GS cutting  
. **milling (machining)**  
machining  
. **milling (machining)**  
RT chemical machining  
grooving  
metal cutting
- planing
- milling (mixing)*  
USE **compounding**
- milling machines**  
GS tools  
. machine tools  
. . . **milling machines**  
RT grinding machines  
∞ machinery  
shapers
- millivoltmeters**  
GS measuring instruments  
. voltmeters  
. . . **millivoltmeters**  
RT galvanometers
- Mills ratio**  
GS ratios  
. **Mills ratio**  
RT failure  
failure analysis  
life (durability)  
mortality  
probability density functions  
statistical analysis
- Milne method**  
GS analysis (mathematics)  
. numerical analysis  
. . . approximation  
. . . **Milne method**  
RT differential equations  
∞ methodology
- Milne-Thomson method**  
RT incompressible flow  
∞ methodology  
Navier-Stokes equation  
viscous flow
- MIM (semiconductors)**  
UF *metal-insulator-metal semiconductors*  
GS electronic equipment  
. solid state devices  
. . . semiconductor devices  
. . . **MIM (semiconductors)**  
semiconductors (materials)  
. **MIM (semiconductors)**  
RT SIS (semiconductors)
- MIM diodes**  
DEF Junction diodes each consisting of an insulating layer sandwiched between two metallic surface layers and exhibiting a negative differential resistance in its V-1 characteristics conceivably because of stimulated inelastic tunneling of electrons. Used for metal-insulator-metal diodes.  
UF *metal-insulator-metal diodes*  
GS electronic equipment  
. diodes  
. . . semiconductor diodes  
. . . junction diodes  
. . . . **MIM diodes**  
. solid state devices  
. . . semiconductor devices  
. . . junction diodes  
. . . . **MIM diodes**  
RT electron tunneling  
MSM (semiconductors)  
negative resistance devices  
semiconductor diodes  
tunnel diodes
- Mimas**  
DEF A satellite of Saturn orbiting at a mean distance of 186,000 kilometers.  
GS celestial bodies  
. natural satellites  
. . . icy satellites  
. . . **Mimas**  
. . . Saturn satellites  
. . . **Mimas**  
RT Saturn (planet)
- MIMD (computers)**  
DEF A type of parallel processor that is

## MIMO (control systems)

essentially two or more individual computers with facilities for interaction and work sharing. Used for multiple instruction multiple data stream.

UF *multiple instruction multiple data stream*

GS data processing equipment

. computers  
. . digital computers  
. . . parallel computers  
. . . . **MIMD (computers)**

RT architecture (computers)  
computer design  
computer programming  
concurrent processing  
interprocessor communication  
operating systems (computers)  
parallel processing (computers)  
SIMD (computers)

### MIMO (control systems)

(added January 1991)

UF *multiple input multiple output*

RT ∞ control  
control stability  
control systems design  
control theory  
feedback control  
∞ systems  
systems stability

### Mindlin plate theory

(added April 1998)

USE **Mindlin plates**

### Mindlin plates

(added April 1998)

UF *Mindlin plate theory*

*Reissner-Mindlin plates*

GS structural members  
. plates (structural members)  
. . **Mindlin plates**

RT dynamic structural analysis  
finite element method  
free vibration  
plate theory  
Reissner theory  
shear strain  
structural analysis  
structural vibration  
thick plates

### mine detectors

GS warning systems

. **mine detectors**

RT ∞ detectors  
warning

### Miner rule

USE **Palmgren-Miner rule**

### mineral deposits

RT contacts (geology)  
dredging  
Earth resources  
excavation  
geology  
lunar mining  
mineralogy  
minerals  
mines (excavations)  
mining  
reserves  
strip mining  
underwater resources  
veins (petrology)

### mineral exploration

GS exploration  
. **mineral exploration**

RT anthracite  
excavation  
minerals  
mines (excavations)  
mining

### mineral metabolism

GS metabolism  
. **mineral metabolism**

RT body fluids

caloric requirements

endocrine systems

secretions

### mineral oils

GS oils

. **mineral oils**

RT lubricating oils

### mineralogy

RT chondrule  
crystallography  
geochemistry  
geology  
mineral deposits  
minerals  
petrogenesis  
petrology  
∞ physical sciences  
siderophile elements  
submarine hydrothermal vents

### minerals

DEF Naturally occurring inorganic elements or compounds having an orderly internal structure and characteristic chemical compositions, crystal forms, and physical properties.

UF *apatites*  
*ores*

GS **minerals**

. akermanite  
. amphiboles  
. anatase  
. aragonite  
. asbestos  
. barite  
. bastnasite  
. beryl  
. . alexandrite  
. bloedite  
. brucite  
. calcite  
. chromites  
. cohenite  
. cordierite  
. cryolite  
. dawsonite  
. dolomite (mineral)  
. euxenite  
. fayalite  
. feldspars  
. . plagioclase  
. fluorite  
. fluorspar  
. garnets  
. . gadolinium-gallium garnet  
. . yttrium-aluminum garnet  
. . yttrium-iron garnet  
. gehlenite  
. graphite  
. . pyrolytic graphite  
. gypsum  
. hexahedrite  
. illite  
. ilmenite  
. iron ores  
. . hematite  
. kamacite  
. kaolinite  
. krep  
. limonite  
. magnetite  
. merwinite  
. mica  
. . biotite  
. . fluorophlogopite  
. . muscovite  
. monticellite  
. montmorillonite  
. nepheline  
. nephelite  
. olivine  
. . forsterite  
. perovskites  
. proustite  
. pyrites  
. pyrophyllite  
. pyroxenes  
. . enstatite  
. pyrrhotite

. . troilite  
. quartz  
. . coesite  
. . stishovite  
. scheelite  
. schreibersite  
. serpentine  
. siderites  
. spinel  
. spodumene  
. talc  
. tourmaline  
. vermiculite  
. wurtzite  
. zinblend  
RT aluminum silicates  
andesite  
bauxite  
beneficiation  
biogeochemistry  
bone mineral content  
boreholes  
calcium silicates  
crystallites  
diomite  
dunite  
Earth resources  
felsite  
fluorosilicates  
geology  
igneous rocks  
impact melts  
lava  
limestone  
lunar soil  
mineral deposits  
mineral exploration  
mineralogy  
monazite sands  
mullites  
∞ nutrients  
obsidian  
potassium silicates  
rocks  
rutile  
shales  
siderophile elements  
silicates  
sodium silicates  
soils  
underground acoustics  
veins (petrology)  
zeolites

### ∞ mines

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT mines (excavations)  
mines (ordnance)

### mines (excavations)

UF *quarries*  
RT core sampling  
drainage  
exploitation  
exploration  
lunar mining  
materials handling  
mineral deposits  
mineral exploration  
∞ mines  
mining  
pits (excavations)  
reserves  
stratigraphy  
strip mining  
subsidence  
underground explosions  
underground storage  
underground structures  
waste disposal

### mines (ordnance)

GS weapons  
. **mines (ordnance)**  
RT ammunition

∞ mines

**miniature electronic equipment**  
 GS electronic equipment  
 . **miniature electronic equipment**  
 RT circuits  
 ∞ electric equipment  
 electronic modules  
 ∞ equipment  
 microminiaturization  
 microminiaturized electronic devices  
 micromodules  
 miniaturization  
 molecular electronics  
 printed circuits  
 solid state devices  
 subminiaturization  
 thin films

**miniaturization**  
 GS **miniaturization**  
 . microminiaturization  
 . subminiaturization  
 RT circuits  
 miniature electronic equipment  
 printed circuits  
 printed resistors  
 transistors  
 wafers

**minicomputers**  
 GS data processing equipment  
 . computers  
 . . digital computers  
 . . . **minicomputers**  
 . . . . Nova computers  
 RT airborne/spaceborne computers  
 Atmospheric & Oceanographic Inform Sys  
 microcomputers

**minima**  
 GS analysis (mathematics)  
 . real variables  
 . . extremum values  
 . . . **minima**  
 . . . . Cramer-Rao bounds  
 RT cusps (mathematics)  
 differential calculus  
 maxima  
 operations research  
 optimization  
 penalty function  
 range (extremes)  
 steepest descent method

**minimal surfaces**  
 DEF Surfaces for which the first variation of the area integral vanish.  
 RT boundary value problems  
 conformal mapping  
 finite element method  
 ∞ surfaces

**minimax technique**  
 RT approximation  
 curve fitting  
 differential games  
 game theory  
 greedy algorithms  
 operations research  
 research  
 saddle points

*minimization*  
 USE **optimization**

**minimum drag**  
 GS dynamic characteristics  
 . drag  
 . . **minimum drag**  
 RT aircraft performance  
 friction drag

**minimum entropy method**  
 DEF Application of entropy in statistical mechanics.  
 GS entropy (statistics)  
 . **minimum entropy method**

RT ∞ methodology

**minimum variance orbit determination**  
 UF *MINIVAR orbit determination*  
 GS computation  
 . orbit calculation  
 . . **minimum variance orbit determination**  
 mechanics (physics)  
 . classical mechanics  
 . . space mechanics  
 . . . orbital mechanics  
 . . . . **minimum variance orbit determination**  
 orbit determination  
 . orbit calculation  
 . . **minimum variance orbit determination**  
 RT statistical analysis

**mining**  
 GS **mining**  
 . lunar mining  
 . strip mining  
 RT anthracite  
 clays  
 dredging  
 energy policy  
 excavation  
 exploitation  
 mineral deposits  
 mineral exploration  
 mines (excavations)  
 underground structures

*minitrack optical tracking system*  
 USE **minitrack system**

**minitrack system**  
 DEF A satellite tracking system consisting of a field of separate antennas and associated receiving equipment interconnected so as to form interferometers which track a transmitting beacon in the payload itself. Used for minitrack optical tracking system and MOTS (tracking system).  
 UF *minitrack optical tracking system*  
*MOTS (tracking system)*  
 RT Global Tracking Network  
 optical tracking  
 satellite tracking  
 space detection and tracking system  
 space surveillance (ground based)  
 spacecraft tracking  
 STDN (network)  
 ∞ systems  
 tracking networks  
 tracking stations  
 ∞ tracks

*MINIVAR orbit determination*  
 USE **minimum variance orbit determination**

**Minkowski space**  
 RT Feynman diagrams  
 light-cone expansion  
 probability theory  
 space-time functions

**Minnesota**  
 GS nations  
 . United States  
 . . **Minnesota**

**minor circle turning flight**  
 GS turning flight  
 . **minor circle turning flight**  
 RT aircraft control

maneuvers

*Minor Planet 1221*  
 USE **Amor asteroid**

*Minor Planet 2060*  
 USE **Chiron**

*minor planets*  
 USE **asteroids**

**minorities**  
 RT American Indians  
 anthropology  
 communities  
 culture (social sciences)  
 nations  
 races (anthropology)  
 sociology  
 voting

**minority carriers**  
 GS charge carriers  
 . **minority carriers**  
 RT additives  
 bipolar transistors  
 carrier injection  
 carrier lifetime  
 diffusion length  
 electron mobility  
 electrons  
 holes (electron deficiencies)  
 semiconductors (materials)

**MINOS computer**  
 GS data processing equipment  
 . computers  
 . . **MINOS computer**

**Minuteman ICBM**  
 UF *Minuteman missiles*  
 GS missiles  
 . ballistic missiles  
 . . intercontinental ballistic missiles  
 . . . **Minuteman ICBM**  
 . surface to surface missiles  
 . . intercontinental ballistic missiles  
 . . . **Minuteman ICBM**  
 RT M-55 engine  
 M-56 engine  
 M-57 engine  
 multistage rocket vehicles  
 solid propellant rocket engines  
 space weapons

*Minuteman missiles*  
 USE **Minuteman ICBM**

**miosis**  
 RT eye (anatomy)  
 ophthalmology  
 tetrad theory  
 vision

**Mir space station**  
 DEF The Soviet space station launched February 20, 1986; its name means peace or world in Russian. It is a manned, modular, permanent, and multi-mission station.  
 GS artificial satellites  
 . space stations  
 . . **Mir space station**  
 manned spacecraft  
 . **Mir space station**  
 Soviet spacecraft  
 . **Mir space station**  
 stations  
 . space stations  
 . . **Mir space station**  
 RT Granat satellite  
 International Space Station  
 Kvant modules  
 Priroda module  
 space bases  
 space laboratories  
 space station modules  
 spacecraft docking

## Mira variables

U.S.S.R. space program

*Mira Ceti star*

USE **Omicron Ceti star**

### Mira variables

DEF Long-period (80 to over 600 days) variable stars of red giant or red supergiant type, exemplified by the star Mira Ceti. Used for long period variables.

UF *long period variables*

GS celestial bodies

. stars

. . late stars

. . . cool stars

. . . . **Mira variables**

. . . . . Omicron Ceti star

. . . variable stars

. . . **Mira variables**

. . . . Omicron Ceti star

RT asymptotic giant branch stars

carbon stars

M stars

red giant stars

S stars

stellar oscillations

supergiant stars

### Mirage 3 aircraft

UF *Dassault Mirage 3 aircraft*

GS attack aircraft

. fighter aircraft

. . Mirage aircraft

. . . **Mirage 3 aircraft**

Dassault aircraft

. Mirage aircraft

. . **Mirage 3 aircraft**

jet aircraft

. Mirage aircraft

. . **Mirage 3 aircraft**

monoplanes

. Mirage aircraft

. . **Mirage 3 aircraft**

single engine aircraft

. Mirage aircraft

. . **Mirage 3 aircraft**

supersonic aircraft

. Mirage aircraft

. . **Mirage 3 aircraft**

tailless aircraft

. **Mirage 3 aircraft**

### Mirage aircraft

DEF Collective term for a class of French attack aircraft.

GS attack aircraft

. fighter aircraft

. . **Mirage aircraft**

. . . Mirage 3 aircraft

Dassault aircraft

. **Mirage aircraft**

. . Mirage 3 aircraft

jet aircraft

. **Mirage aircraft**

. . Mirage 3 aircraft

monoplanes

. **Mirage aircraft**

. . Mirage 3 aircraft

single engine aircraft

. **Mirage aircraft**

. . Mirage 3 aircraft

supersonic aircraft

. **Mirage aircraft**

. . Mirage 3 aircraft

### Miranda

DEF A satellite of Uranus orbiting at a mean distance of 124,000 kilometers.

GS celestial bodies

. natural satellites

. . Uranus satellites

. . . **Miranda**

RT Uranus (planet)

### Miranda satellite

DEF This United Kingdom satellite was launched in 1974 into a sun synchronous, low Earth orbit. Prime objective of the mission was to experiment with satellite attitude control. It

ceased to operate the same year it was launched.

GS artificial satellites

. scientific satellites

. . UK satellites

. . . **Miranda satellite**

. . synchronous satellites

. . **Miranda satellite**

RT attitude control

### Miros system

UF *modulating retrodirective optics*

GS modulation

. light modulation

. . **Miros system**

RT optical measuring instruments

∞ systems

### mirror fusion

DEF An open-ended configuration which traps low beta plasmas. It is realized by associating two identical magnetic mirrors having the same axis.

RT fusion reactors

magnetic mirrors

nuclear fusion

plasma control

tandem mirrors

thermal barriers (plasma control)

### mirror point

RT magnetic mirrors

radiation belts

### mirrors

GS **mirrors**

. telescopes

. etalons

. Fresnel reflectors

. honeycomb mirrors

. magnetic mirrors

. . tandem mirrors

. deformable mirrors

. paraboloid mirrors

. rotating mirrors

. segmented mirrors

. solettas

RT Bragg reflectors

Cassegrain optics

circumsolar telescopes

collimators

heliostats

optical coatings

optical equipment

optical materials

optical resonators

∞ optics

reflecting telescopes

reflectors

solar collectors

solar reflectors

specular reflection

telescopes

x ray optics

### MIS (semiconductors)

UF *metal insulator semiconductors*

GS electronic equipment

. solid state devices

. . semiconductor devices

. . . **MIS (semiconductors)**

semiconductors (materials)

. **MIS (semiconductors)**

RT SIS (semiconductors)

### misalignment

SN (EXCLUDES PSYCHOLOGICAL DISORIENTATION)

UF *misorientation*

RT attitude (inclination)

disorientation

position (location)

### mischmetal

(added June 1998)

DEF An alloy consisting of a natural mixture of rare-earth metals; used in electrode materials and hydrogen-storage alloys, as a general alloy addition, and in the production of some aluminum alloys and steels.

GS alloys

. rare earth alloys

. . **mischmetal**

RT alloying

aluminum alloys

cathodic coatings

cerium

desorption

electrode materials

intermetallics

steels

*miscibility*

USE **solubility**

### miscibility gap

RT phase separation (materials)

solubility

space processing

temperature dependence

*MISFETs*

USE **field effect transistors**

### mismatch (electrical)

DEF Condition in which the impedance of a source does not match or equal the impedance of the connected load or transmission line.

RT electrical measurement

impedance measurement

matching

*misorientation*

USE **misalignment**

### MISR (radiometry)

(added May 2007)

DEF A high resolution imaging spectroradiometer aboard the Terra spacecraft that measures the Earth's brightness in 4 spectral bands at 9 different look angles in order to increase the understanding of the impacts of different types of atmospheric particles and clouds on global climate. Launched in August 1999.

UF *Multi-angle Imaging*

*Spectroradiometer*

GS measuring instruments

. radiation measuring instruments

. . actinometers

. . . radiometers

. . . . spectroradiometers

. . . . . **MISR (radiometry)**

. satellite-borne instruments

RT **MISR (radiometry)**

aerosols

albedo

clouds (meteorology)

data products

Earth atmosphere

Earth Observing System (EOS)

reflectance

remote sensing

satellite imagery

satellite observation

Terra spacecraft

terrestrial radiation

### miss distance

GS distance

. **miss distance**

RT accuracy

air to surface missiles

### missile antennas

GS antennas

. **missile antennas**

missile components

. **missile antennas**

RT aircraft antennas

directional antennas

microwave antennas

### missile bodies

UF *missile cases*

GS missile components

. **missile bodies**

RT airframes

axisymmetric bodies

blunt bodies

∞ bodies

- cases (containers)
  - finned bodies
  - rocket engine cases
  - slender bodies
  - streamlined bodies
- missile cases*  
USE **missile bodies**
- missile components**
- GS **missile components**
    - . missile antennas
    - . missile bodies
  - RT ∞ components
    - engines
    - fins
    - nose cones
    - warheads
    - wings
- missile configurations**
- GS **missile configurations**
    - . Sandpiper target missile
  - RT aerodynamic configurations
    - aircraft configurations
  - ∞ configurations
    - hammerhead configuration
    - launch vehicle configurations
    - missiles
    - multiengine vehicles
    - Patriot missile
    - propulsion system configurations
    - rocket engines
    - rocket vehicles
- missile construction*  
USE **missile structures**
- missile control**
- UF *missile guidance*  
*missile stabilization*
  - RT actuators
    - analog computers
    - attitude control
    - automatic control
    - automatic flight control
    - beam rider guidance
  - ∞ control
    - directional control
    - flight control
    - ground based control
    - homing
    - laser guidance
    - lateral control
    - longitudinal control
    - missiles
    - proportional navigation
    - radar homing missiles
    - radio control
    - remote control
    - rocket engine control
    - spacecraft control
    - star trackers
    - thrust vector control
    - visual control
- missile defense**
- SN (SYSTEMS DESIGNED TO PROTECT MISSILES AGAINST ATTACK)
  - RT antimissile defense
    - antimissile missiles
    - antiradiation missiles
    - ballistic missile decoys
  - ∞ defense
    - defense industry
    - defense program
    - hardening (systems)
    - military technology
    - missiles
    - optical countermeasures
    - reentry decoys
    - Safeguard system
    - weapons delivery
- missile design**
- RT aerospace engineering
    - aircraft design
    - computer aided design
  - ∞ design
  - ∞ development
- engine design
  - flight tests
  - functional design specifications
  - Magnus effect
  - reliability
  - structural design
  - systems engineering
- missile detection**
- GS detection
    - . **missile detection**
  - RT early warning systems
    - electronic warfare
    - identifying
    - target acquisition
    - target recognition
- missile engine cases*  
USE **rocket engine cases**
- missile guidance*  
USE **missile control**
- missile launchers**
- GS launchers
    - . **missile launchers**
    - . . mobile missile launchers
  - RT ballistic missile submarines
    - catapults
    - ground support equipment
    - gun launchers
    - launch vehicles
    - launching
    - launching sites
    - missiles
    - rocket launchers
    - sea launching
    - weapon systems
- missile ranges**
- SN (EXCLUDES DISTANCE OF MISSILE TRAVEL)
  - GS ranges (facilities)
    - . test ranges
    - . . **missile ranges**
    - test facilities
    - . test ranges
    - . . **missile ranges**
  - RT ballistic ranges
    - downrange
    - hypersonic test apparatus
    - missiles
    - range safety
    - reentry range
- missile signatures**
- GS signatures
    - . **missile signatures**
  - RT detection
    - signature analysis
    - target recognition
- missile silos**
- UF *silos (missile storage)*
  - RT buildings
    - launching sites
    - MX missile
  - ∞ storage
- missile simulators**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT computerized simulation
    - flight simulators
    - mathematical models
    - missiles
    - simulators
    - training simulators
    - wind tunnel models
- missile stabilization*  
USE **missile control stabilization**
- missile storage**
- RT ground support equipment
    - mobile missile launchers
    - propellant storage
  - ∞ storage
- underground storage
- missile structures**
- UF *missile construction*
  - RT airframes
    - ∞ structures
    - tail assemblies
- missile systems**
- GS weapon systems
    - . **missile systems**
    - . . Nike X systems
    - . . Safeguard system
  - RT aerospace systems
    - beam rider guidance
    - mobile missile launchers
    - radar homing missiles
  - ∞ systems
- missile tests**
- RT captive tests
    - engine tests
    - flight tests
    - fuel tests
    - ground tests
    - missiles
    - prelaunch tests
    - propellant tests
    - stability tests
    - static tests
    - test firing
    - test vehicles
  - ∞ tests
    - wind tunnel stability tests
- missile tracking**
- GS tracking (position)
    - . **missile tracking**
  - RT infrared tracking
    - laser target designators
    - polystation doppler tracking system
    - range and range rate tracking
    - space detection and tracking system
    - spacecraft tracking
    - tracking networks
    - tracking stations
- missile trajectories**
- GS trajectories
    - . **missile trajectories**
  - RT ascent trajectories
    - ballistic trajectories
    - Cobra Dane (radar)
    - descent trajectories
    - flight mechanics
    - flight paths
    - impact prediction
    - parabolic flight
    - reentry trajectories
    - spinning unguided rocket trajectory
    - underwater trajectories
- missile vibration**
- GS vibration
    - . structural vibration
    - . . **missile vibration**
  - RT bending vibration
    - breathing vibration
    - flutter
    - linear vibration
    - random vibration
    - self induced vibration
    - supersonic flutter
    - torsional vibration
    - transonic flutter
- missiles**
- DEF Any objects thrown, dropped, fired, launched, or otherwise projected with the purpose of striking a target.
  - GS **missiles**
    - . air slew missiles
    - . air to air missiles
    - . . Falcon missile
    - . . Matra missile
    - . . Sidewinder missiles
    - . . Sparrow missiles
    - . . . Sparrow 2 missile
    - . . . Sparrow 3 missile
    - . air to surface missiles



## missing mass (astrophysics)

- . . Bullpup missiles
- . . Condor missile
- . . Harpoon missile
- . . Hound Dog missile
- . . Maverick missiles
- . . quail missile
- . . Shrike missile
- . Antelope missile
- . anti-aircraft missiles
- . . BOMARC missiles
- . . . BOMARC A missile
- . . . BOMARC B missile
- . . Falcon missile
- . . Mauler missile
- . . Nike-Ajax missile
- . . Nike-Hercules missile
- . . Redeye missile
- . . SIAM missiles
- . . Sidewinder missiles
- . . tartar missile
- . . terrier missile
- . anti-missile missiles
- . . Mauler missile
- . . Nike-Zeus missile
- . . Spartan missile
- . . Sprint missile
- . anti-radiation missiles
- . anti-ship missiles
- . ballistic missiles
- . . field army ballistic missiles
- . . intercontinental ballistic missiles
- . . . Atlas ICBM
- . . . . Atlas D ICBM
- . . . . Atlas E ICBM
- . . . . Atlas F ICBM
- . . . Minuteman ICBM
- . . . MX missile
- . . . Titan ICBM
- . . . . Titan 1 ICBM
- . . . . Titan 2 ICBM
- . . intermediate range ballistic missiles
- . . . Blue Streak missile
- . . . Jupiter missile
- . . . polaris missiles
- . . . . Polaris A1 missile
- . . . . Polaris A2 missile
- . . . . Polaris A3 missile
- . . Pershing missile
- . . Poseidon missiles
- . . short range ballistic missiles
- . . Skybolt missile
- . . Subroc missile
- . . V-2 missile
- . Blue Steel missile
- . Bumblebee project
- . Corvus missile
- . Osprey missile
- . precision guided projectiles
- . radar homing missiles
- . ramjet missiles
- . . Navaho missile
- . . supersonic low altitude missile
- . Sandpiper target missile
- . SS-11 missile
- . surface to air missiles
- . . Blue Goose missile
- . . BOMARC missiles
- . . . BOMARC A missile
- . . . BOMARC B missile
- . . Chaparral missile
- . . Hawk missile
- . . Mauler missile
- . . Nike missiles
- . . . Nike-Ajax missile
- . . . Nike-Hercules missile
- . . . Nike-Zeus missile
- . . Patriot missile
- . . Redeye missile
- . . Sprint missile
- . . Talos missile
- . . tartar missile
- . . terrier missile
- . surface to surface missiles
- . . anti-tank missiles
- . . . Shillelagh missiles
- . . . tow missiles
- . . Corporal missile
- . . cruise missiles
- . . Navaho missile

- . . . Tomahawk missiles
- . . fleet ballistic missiles
- . . . Polaris A1 missile
- . . . Polaris A2 missile
- . . . Polaris A3 missile
- . . . Poseidon missiles
- . . . Subroc missile
- . . intercontinental ballistic missiles
- . . . Atlas ICBM
- . . . . Atlas D ICBM
- . . . . Atlas E ICBM
- . . . . Atlas F ICBM
- . . . Minuteman ICBM
- . . . MX missile
- . . . Titan ICBM
- . . . . Titan 1 ICBM
- . . . . Titan 2 ICBM
- . . intermediate range ballistic missiles
- . . . Blue Streak missile
- . . . Jupiter missile
- . . . polaris missiles
- . . . . Polaris A1 missile
- . . . . Polaris A2 missile
- . . . . Polaris A3 missile
- . . Lance missile
- . . Mace missiles
- . . Pershing missile
- . . Regulus missile
- . . sergeant missiles
- . . short range ballistic missiles
- . . supersonic low altitude missile
- . . V-1 missile
- . . underwater to surface missiles
- . . Subroc missile
- RT ammunition
- anti-missile defense
- anti-ship warfare
- artillery
- ascent propulsion systems
- auxiliary propulsion
- bombs (ordnance)
- electromagnetic missiles
- flight test vehicles
- ∞ flight vehicles
- ground support equipment
- guidance (motion)
- homing devices
- hypersonic flight
- incendiary ammunition
- launch vehicles
- launching sites
- missile configurations
- missile control
- missile defense
- missile launchers
- missile ranges
- ∞ missile simulators
- missile tests
- multi-engine vehicles
- Nike X systems
- nuclear weapons
- plasma sheaths
- propulsion
- reentry
- reentry vehicles
- rocket catapults
- rocket engines
- rocket propellants
- ∞ rockets
- ∞ SCRAM
- spacecraft launching
- spin stabilization
- stage separation
- supersonic combustion ramjet engines
- supersonic flight
- terminal ballistics
- test vehicles
- torpedoes
- trajectories
- transportation
- ∞ vehicles
- warheads
- weapon systems
- weapons
- ∞ winged vehicles

## missing mass (astrophysics)

DEF A problem related to a cluster of galax-

ies in which the mass derived from the dynamical stability of its member galaxies, the dynamical mass, is substantially larger than the mass estimated by the mass-to-luminosity ratio of the visible parts of the galaxies, the visible mass.

- GS cosmology
- . **missing mass (astrophysics)**
- mass
- . **missing mass (astrophysics)**
- RT astronomy
- astrophysics
- dark matter
- dynamic stability
- galactic clusters
- galactic halos
- galactic structure
- large-scale structure of the universe
- mass distribution
- mass to light ratios
- massive compact halo objects
- virial theorem
- weakly interacting massive particles

## mission adaptive wings

- GS airfoils
- . wings
- . . **mission adaptive wings**
- RT adaptive control
- F-111 aircraft
- gust alleviators
- variable geometry structures
- variable sweep wings
- wing camber
- wing profiles

## mission planning

- GS planning
- . **mission planning**
- RT budgeting
- commerce lab
- critical path method
- estimating
- forecasting
- lessons learned
- management
- management planning
- ∞ missions
- observation scheduling
- ∞ operations
- operations research
- payload integration
- ∞ plans
- predictions
- prelaunch summaries
- programs
- project management
- scheduling
- Ulysses mission

## Mission to Planet Earth

(added April 1995)

DEF A NASA initiated program that uses both space and ground based measurement systems to provide the scientific basis for understanding global change.

- UF *MTPE*
- GS programs
- . NASA programs
- . . **Mission to Planet Earth**
- RT climate change
- Earth Observing System (EOS)
- geophysics
- global warming
- ∞ missions
- remote sensing
- scientific visualization

## ∞ missions

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aborted missions
- asteroid missions
- Astro missions (STS)
- Cassini mission
- Cluster Mission
- Comet Rendezvous Asteroid Flyby Mission
- Earth-Venus trajectories
- expeditions

- flyby missions
  - Galileo spacecraft
  - Grand Tours
  - Heat Capacity Mapping Mission
  - Landsat follow-on missions
  - long duration space flight
  - Mariner Jupiter-Saturn flyby
  - Mariner Jupiter-Uranus flyby
  - Mars missions
  - mission planning
  - Mission to Planet Earth
  - planning
  - programs
  - project planning
  - projects
  - Rosetta mission
  - SOHO Mission
  - Solar Maximum Mission
  - Solar Maximum Mission-A
  - space flight
  - space missions
  - Space Shuttle missions
  - targets
  - Ulysses mission
  - Voyager 1977 mission
- Mississippi**
- GS nations
    - . United States
    - . . **Mississippi**
  - RT Gulf of Mexico
- Mississippi Delta (LA)**
- GS landforms
    - . deltas
    - . . **Mississippi Delta (LA)**
  - RT Louisiana
  - rivers
- Mississippi River (US)**
- GS rivers
    - . **Mississippi River (US)**
  - RT drainage patterns
  - Earth resources
  - floods
  - resources
  - river basins
- Missouri**
- GS nations
    - . United States
    - . . **Missouri**
  - RT Missouri River (US)
  - St Louis-Kansas City Corridor (MO)
- Missouri River (US)**
- GS rivers
    - . **Missouri River (US)**
  - RT Iowa
  - Kansas
  - Missouri
  - Montana
  - Nebraska
  - North Dakota
  - river basins
  - South Dakota
  - United States
  - valleys
- Missouri River Basin (US)**
- GS landforms
    - . structural basins
    - . . river basins
    - . . . **Missouri River Basin (US)**
  - RT rivers
  - watersheds
- mist**
- SN (ATMOSPHERIC WATER)
  - DEF Liquid, usually water in the form of particles suspended in the atmosphere at or near the surface of the Earth; small water droplets floating or falling, approaching the form of rain, and sometimes distinguished from fog as being more transparent or as having particles perceptibly moving downward.
  - GS particles
    - . **mist**
  - RT aerosols
  - dispersions
- fog
  - fog dispersal
  - haze
  - haze detection
  - precipitation (meteorology)
- mistuning (turbomachinery)**  
(added July 1991)
- RT rotating disks
  - ∞ rotor blades
  - rotor blades (turbomachinery)
  - rotors
  - tuning
  - turbomachine blades
  - vibration
- mitochondria**
- GS organelles
    - . **mitochondria**
  - RT cells (biology)
  - cytology
- mitosis**
- GS cytogenesis
    - . **mitosis**
  - RT cell division
  - cells (biology)
  - chromosome aberrations
  - chromosomes
  - cytology
  - cytoplasm
  - mutations
  - physiology
  - reproduction (biology)
- mitra**
- RT fungi
  - plants (botany)
- MIUS**  
USE **Modular Integrated Utility System**
- mixed crystals**
- GS crystals
    - . **mixed crystals**
  - RT powder metallurgy
  - sintering
- mixed flow*  
USE **multiphase flow**
- mixed oxides**
- DEF Mixture of oxides, particularly of radioactive metals.
  - GS chalcogenides
    - . oxides
    - . . metal oxides
    - . . . **mixed oxides**
    - . . . . BSCCO superconductors
    - . . . . YBCO superconductors
  - RT high temperature superconductors
  - nuclear fuels
  - plutonium oxides
  - strontium oxides
  - uranium oxides
- mixers**
- SN (EXCLUDES MIXING CIRCUITS)
  - RT admixtures
  - aeration
  - aerosols
  - agitation
  - baffles
  - blowers
  - carburetors
  - coalescing
  - contactors
  - ∞ diffusers
  - ∞ dispersion
  - feeders
  - grinding mills
  - mixing
  - mixtures
  - paddles
  - plows
  - plungers
  - separators
  - shakers
  - sprayers
  - stirring
- tumbling motion
- mixing**
- GS **mixing**
    - . colloidizing
    - . compounding
    - . dissolving
    - . homogenizing
    - . laminar mixing
    - . premixing
    - . signal mixing
    - . suspending (mixing)
    - . turbulent mixing
  - RT aeration
  - agitation
  - blowing
  - chokes
  - diffusion
  - dilution
  - grinding (comminution)
  - jet mixing flow
  - liquid injection
  - metal powder
  - mixers
  - mixing layers (fluids)
  - mixing ratios
  - mixtures
  - premixed flames
  - ∞ separation
  - shaking
  - spraying
  - swirling
  - tangling
  - trapped vortices
  - turbulence
  - vortices
- mixing circuits**
- GS circuits
    - . **mixing circuits**
  - RT frequency converters
  - frequency synthesizers
  - heterodyning
  - preamplifiers
- mixing depth*  
USE **mixing height**
- mixing height**
- DEF The heights of the layer through which the atmosphere is well mixed. The height will vary with diurnal, seasonal, and regional variations. Used for mixing depth.
  - UF *mixing depth*
  - RT air pollution
  - atmospheric circulation
  - convection
  - convection currents
  - vertical air currents
  - wind (meteorology)
  - zonal flow (meteorology)
- mixing layers (fluids)**  
(added September 1988)
- DEF Fluid layers in which multicomponent mixing occurs.
  - RT advection
  - atmospheric boundary layer
  - atmospheric stratification
  - boundary layers
  - convection
  - Ekman layer
  - jet mixing flow
  - laminar mixing
  - ∞ layers
  - mixing
  - mixing length flow theory
  - shear layers
  - turbulent boundary layer
  - turbulent mixing
  - two fluid models
- mixing length flow theory**
- GS flow theory
    - . **mixing length flow theory**
    - kinetic theory
    - . transport theory
    - . . **mixing length flow theory**
  - RT mixing layers (fluids)
  - shear flow

## mixing ratios

∞ theories  
turbulence models  
turbulent flow  
turbulent mixing  
vorticity transport hypothesis

### mixing ratios

(added September 1993)

GS dimensionless numbers  
. **mixing ratios**  
ratios  
. mass ratios  
. . . **mixing ratios**  
RT atmospheric composition  
atmospheric moisture  
gas mixtures  
gaseous diffusion  
humidity  
mixing  
moisture content  
water vapor

### mixtures

UF *blends*  
GS **mixtures**  
. admixtures  
. binary mixtures  
. . . binary fluids  
. . . eutectics  
. . . eutectic alloys  
. dispersions  
. . . colloids  
. . . aerosols  
. . . . fog  
. . . colloidal propellants  
. emulsions  
. . . photographic emulsions  
. . . . nuclear emulsions  
. liquid-gas mixtures  
. . . aerosols  
. . . . fog  
. . . plastisols  
. . . smoke  
. polymer blends  
. sialon  
. slurries  
. solid suspensions  
. solutions  
. . . aqueous solutions  
. . . gas mixtures  
. . . . air  
. . . . . alveolar air  
. . . . . compressed air  
. . . . . expired air  
. . . . . high temperature air  
. . . . . liquid air  
. . . detonable gas mixtures  
. . . photographic emulsions  
. . . nuclear emulsions  
. . . solid solutions  
RT alloys  
azeotropes  
∞ combination  
composite materials  
composition (property)  
dissolved gases  
eutectic composites  
formulations  
ingredients  
mixers  
mixing  
paste (consistency)  
solubility

*MJO (meteorology)*

(added September 2000)

USE **Madden-Julian Oscillation**

### ML-1 nuclear power plant

GS electric power plants  
. nuclear power plants  
. . . **ML-1 nuclear power plant**  
nuclear electric power generation  
. nuclear power plants  
. . . **ML-1 nuclear power plant**

RT ∞ power plants

*MLA*

USE **multispectral linear arrays**

*MMH (chemistry)*

(added February 2001)

USE **monomethylhydrazines**

*MMS*

USE **multimission modular spacecraft**

### mnemonics

RT memory  
nomenclatures  
symbolic programming  
symbols

*MNOS*

USE **metal-nitride-oxide-silicon**

### mobile communication systems

DEF Any configuration of mobile or transportable voice and data communication equipment which allows for communication between combinations of mobile/fixed points with or without the aid of satellites.

GS **mobile communication systems**

. land mobile satellite service  
RT communication satellites  
Iridium network  
MSAT  
radio communication  
Rayleigh fading

### mobile lounges

RT airfield surface movements  
airports  
ground handling  
∞ lounges

### mobile missile launchers

GS launchers  
. missile launchers  
. . . **mobile missile launchers**  
RT ballistic missile submarines  
missile storage  
missile systems  
weapon systems

### mobile quarantine facility

RT aerospace medicine  
evacuating (transportation)  
∞ facilities  
medical equipment  
medical services  
physical examinations  
physiological tests

*Mobile Servicing System (ISS)*

(added September 2001)

USE **Space Station Mobile Servicing System**

### mobility

SN (EXCLUDES CONSIDERATIONS OF MANNED AND UNMANNED CRAFT)  
GS **mobility**  
. atomic mobilities  
. carrier mobility  
. . . electron mobility  
. . . hole mobility  
. ionic mobility  
RT ∞ conductivity  
diffusivity  
drift rate  
Hall effect  
kinetic theory  
portable equipment  
transport properties

*MOCVD (vapor deposition)*

USE **metalorganic chemical vapor deposition**

### modal response

UF *mode shapes*  
GS responses  
. **modal response**  
RT dynamic response

stroking tests

### Modcomp II computer

GS data processing equipment  
. computers  
. . . digital computers  
. . . **Modcomp II computer**

### Modcomp IV computer

GS data processing equipment  
. computers  
. . . digital computers  
. . . **Modcomp IV computer**

∞ **mode**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT failure modes  
mode (statistics)  
modes

### mode (statistics)

RT average  
distribution moments  
failure modes  
mean  
median (statistics)  
∞ mode  
modes  
moments  
quality control

*mode coupling*

USE **coupled modes**

*mode of vibration*

USE **vibration mode**

*mode shapes*

USE **modal response**

### mode transformers

GS transducers  
. **mode transformers**  
transformers  
. **mode transformers**  
RT impedance matching  
propagation modes  
transmission lines  
vibration mode  
waveguide tuners

### model reference adaptive control

DEF This deals with three parameters: an ideal adaptive control system whose response is agreed to be optimum; computer simulation in which both the model system and the actual system are subjected to the same stimulus; and parameters of the actual system which are adjusted to minimize the difference in the outputs of the model and the actual system. Used for MRAC (systems).

UF *MRAC (systems)*

GS automatic control  
. adaptive control  
. . . **model reference adaptive control**  
RT automata theory  
autonomy  
∞ control  
control theory  
cybernetics  
dynamic control  
feedback control  
feedforward control  
mathematical models  
optimal control  
self alignment  
systems simulation

### models

GS **models**  
. aircraft models  
. astronomical models  
. . . density wave model  
. . . stellar models  
. atmospheric models  
. . . Atmospheric General Circulation Models  
. . . reference atmospheres  
. breadboard models

- . climate models
- . digital elevation models
- . dynamic models
- . electroweak model
- . environment models
- . Gutenberg zone
- . hydrology models
- . Lighthill gas model
- . mathematical models
  - .. analog simulation
  - .. BGK model
  - .. biological models (mathematics)
  - .. digital simulation
  - .. Mandelstam representation
  - .. Petri nets
  - .. Thomas-Fermi model
  - .. turbulence models
    - ... Baldwin-Lomax turbulence model
    - ... k-epsilon turbulence model
    - ... k-omega turbulence model
  - .. Veneziano model
  - .. nuclear models
  - .. ocean models
  - .. quark models
  - .. quark parton model
  - .. scale models
  - .. semispan models
  - .. spacecraft models
  - .. standard model (particle physics)
  - .. static models
  - .. three dimensional models
  - .. two dimensional models
  - .. vector dominance model
  - .. wind tunnel models
    - ... powered models
  - .. animal models
  - .. multiscale models
  - .. knockout mice

RT analogs  
dummies  
layouts  
pilot plants  
replicas  
simulators  
test facilities

#### modems

UF *modulators-demodulators*  
GS demodulators  
. **modems**  
modulators  
. **modems**

RT data transmission  
peripheral equipment (computers)  
phase demodulators  
phase modulation  
pulse amplitude modulation  
pulse communication  
pulse duration modulation  
pulse frequency modulation  
pulse modulation  
pulse position modulation

#### Moderate Resolution Imaging Spectroradiometer

(added June 2003)

USE **MODIS (radiometry)**

#### moderation (energy absorption)

GS energy absorption  
. **moderation (energy absorption)**  
.. thermalization (energy absorption)  
... neutron thermalization

RT  $\infty$  absorption  
limiters (fusion reactors)  
moderators

#### moderators

DEF Materials that have a high cross section for slowing down fast neutrons with a minimum of absorption, e.g., heavy water, beryllium, used in reactor cores.

RT beryllium  
blankets (fusion reactors)  
graphite  
heavy water  
limiters (fusion reactors)  
moderation (energy absorption)  
neutron absorbers  
nuclear reactors

reactor materials  
water

#### modes

GS **modes**  
. axial modes  
. ballooning modes  
. coupled modes  
. failure modes  
. laser modes  
. modes (standing waves)  
. propagation modes  
. . . whispering gallery modes  
. pushbroom sensor modes  
. vibration mode  
. . . uncoupled modes  
RT  $\infty$  mode  
mode (statistics)  
tearing modes (plasmas)

#### modes (standing waves)

GS modes  
. **modes (standing waves)**  
RT uncoupled modes  
vibration

#### MODFETS

DEF Heterojunction field effect transistor device structures in which only the larger (Al, Ga)As bandgap is doped with donors while the GaAs layer is left undoped. This results in high electron mobilities due to spatially separated electrons and donors. Used for modulation doped FETs.

UF *modulation doped fets*  
GS electronic equipment  
. solid state devices  
. . . semiconductor devices  
. . . . heterojunction devices  
. . . . high electron mobility transistors  
. . . . **MODFETS**  
. . . . transistors  
. . . . field effect transistors  
. . . . **MODFETS**  
. . . . high electron mobility transistors  
. . . . **MODFETS**  
RT aluminum gallium arsenides  
doped crystals  
energy gaps (solid state)  
gallium arsenides  
indium arsenides  
ion implantation

#### modification

USE **revisions**

#### modified embedded atom method

(added February 1998)

USE **embedded atom method**

#### MODIS (radiometry)

(added June 2003)

DEF A high resolution spectroradiometer aboard the Terra and Aqua spacecraft designed to gather spectral data in 36 bands in order to increase the understanding of global environmental dynamics and processes. Launched in 1999.

UF *Moderate Resolution Imaging Spectroradiometer*

GS measuring instruments  
. radiation measuring instruments  
. . . actinometers  
. . . radiometers  
. . . . spectroradiometers  
. . . . **MODIS (radiometry)**

RT Aqua spacecraft  
data products  
Earth observations (from space)  
remote sensing  
Terra spacecraft

#### Modular Integrated Utility System

DEF A joint NASA-HUD concept incorporating various utilities -- electric power plant, water supply, heating and air conditioning, sewage treatment, and waste disposal into a single system having increased efficiency and economy. Use for MIUS.

UF *MIUS*

RT air conditioning  
communities  
electric power plants  
heating  
potable water  
sewage treatment  
 $\infty$  systems  
utilities  
waste disposal

#### modular ratios

GS mechanical properties  
. **modular ratios**  
ratios  
. **modular ratios**  
RT composite materials  
stress ratio  
structural analysis  
structural engineering

#### modularity

RT architecture (computers)  
avionics  
computer programs  
electronic modules  
systems engineering

#### modulated continuous radiation

GS continuous radiation  
. **modulated continuous radiation**  
electromagnetic radiation  
. **modulated continuous radiation**  
RT coherent electromagnetic radiation  
phase deviation  
 $\infty$  radiation

#### modulating retrodirective optics

USE **Miros system**

#### modulation

DEF The variation in the value of some parameter characterizing a periodic oscillation. Specifically, variation of some characteristic of a radio wave, called the carrier wave, in accordance with instantaneous values of another wave, called the modulating wave. Used for carrier modulation.

UF *carrier modulation*

GS **modulation**  
. amplitude modulation  
. . . quadrature amplitude modulation  
. frequency modulation  
. . . feedback frequency modulation  
. . . FM/PM (modulation)  
. . . frequency shift keying  
. . . pulse frequency modulation  
. intermodulation  
. ionospheric cross modulation  
. light modulation  
. . . Miros system  
. . . ultrasonic light modulation  
. phase modulation  
. . . FM/PM (modulation)  
. . . phase shift keying  
. . . binary phase shift keying  
. . . quadrature phase shift keying  
. polarization modulation  
. pulse modulation  
. . . pulse amplitude modulation  
. . . pulse code modulation  
. . . . delta modulation  
. . . differential pulse code modulation  
. . . pulse frequency modulation  
. . . pulse time modulation  
. . . pulse duration modulation  
. . . pulse position modulation  
. traveling wave modulation  
. velocity modulation

RT carrier frequencies  
carrier waves  
companding  
crystallization  
demodulation  
demodulators  
double sideband transmission  
dynamic range  
interference factor table  
modulators  
P.A.C.M. telemetry  
pulse frequency modulation telemetry

## modulation doping

radio transmission  
remodulation  
selective fading  
telecommunication  
wave interaction

*modulation doped fets*

USE **MODFETS**

### modulation doping

DEF The process of doping only the larger bandgap of a heterojunction device with donors, while the other layer is left undoped. Since the electrons and donors are spatially separated, ionized impurity scattering is avoided and extremely high electron mobilities are obtained.

GS doping (materials)

. **modulation doping**

RT additives

donor materials  
doped crystals  
electron mobility  
energy gaps (solid state)  
heterojunction devices  
heterojunctions  
high electron mobility transistors  
ion implantation  
semiconductor devices  
semiconductors (materials)

### modulation transfer function

UF *MTF*

GS functions (mathematics)

. transfer functions

. . **modulation transfer function**

RT figure of merit

imaging techniques  
optical measurement  
optical transfer function

∞ performance

system effectiveness  
systems analysis

### modulators

DEF Devices to effect the process of modulation.

GS **modulators**

. Bragg cells  
. light modulators  
. modems

RT amplifiers

amplitude modulation  
demodulators  
electron tubes  
frequency modulation  
light modulation  
matched filters  
modulation  
phase modulation  
pulse modulation

*modulators-demodulators*

USE **modems**

### modules

DEF 1, Self contained units of a launch vehicle or spacecraft that serve as building blocks for the overall structure. 2, A one package assembly of functionally associated electronic parts, usually a plug-in unit, so arranged as to function as a system or subsystem.

GS **modules**

. airlock modules  
. chemical release modules  
. electronic modules  
. . . micromodules  
. local scientific survey module  
. payload assist module  
. power modules (STS)  
. service modules  
. . . Multi-Purpose Logistics Modules  
. spacecraft docking modules  
. spacecraft modules  
. . . command modules  
. . . command service modules  
. . . landing modules  
. . . lunar landing modules  
. . . . Lunar Module  
. . . . Apollo lunar experiment  
module

. . . . . LSSM  
. . . . . Lunar Module 5  
. . . . . Lunar Module 7  
. . . . . Altair Lunar Lander  
. . . . . Mars Excursion Module  
. . . . . SIM  
. . . . . space station modules  
. . . . . Columbus module  
. . . . . Cupola Module  
. . . . . Destiny Laboratory Module  
. . . . . Kibo Japanese Experiment Module  
. . . . . Kvant modules  
. . . . . Multi-Purpose Logistics Modules  
. . . . . Priroda module  
. . . . . Service Module (ISS)  
. . . . . Unity connecting module  
. . . . . Zarya control module

RT circuits

compartments  
∞ components  
instrument packages  
space tugs  
spare parts

### modulus of elasticity

DEF The ratio of stress (nominal) to corresponding strain below the proportional limit of a material. It is expressed in force per unit area. Used for compliance (elasticity), elastic modulus, and Young modulus.

UF *compliance (elasticity)*

*elastic modulus*

*Young modulus*

GS mechanical properties

. elastic properties

. . **modulus of elasticity**

. . . dynamic modulus of elasticity

RT anelasticity

bending  
Hookes law  
hydroelasticity  
nanoindentation  
Poisson ratio  
proportional limit  
∞ rigidity  
shear properties  
stiffness  
stress-strain diagrams

### MOEMS

*(added December 2005)*

USE **microoptoelectromechanical systems**

*Mohawk aircraft*

USE **OV-1 aircraft**

*Mohr circles*

USE **fracture mechanics**

### Moire effects

RT beat frequencies

birefringence

diffraction

∞ effects

fringe multiplication

interference grating

∞ methodology

Moire fringes

Moire interferometry

photoelastic analysis

Schlieren photography

### Moire fringes

DEF The bands which appear in the Moire effect.

RT diffraction patterns

fringe multiplication

interference grating

Moire effects

stress analysis

stress concentration

### Moire interferometry

DEF The use of intersecting families of curves as instruments for making precise measurement, the study of indices of refractions, etc. by utilizing the interference patterns.

GS interferometry

. **Moire interferometry**

RT diffraction patterns  
holographic interferometry  
Moire effects

### moisture

GS **moisture**

. atmospheric moisture  
. soil moisture

RT humidity

hygral properties  
meteorological parameters  
meteorology  
water  
water vapor

### moisture content

UF *dampness*

*water content*

*wetness*

GS composition (property)

. concentration (composition)

. . **moisture content**

. . . atmospheric moisture

RT

atmospheric composition  
chemical properties  
humidity  
hydrothermal stress analysis  
hygroscopicity  
lysimeters  
mixing ratios  
soil moisture  
water  
water vapor

*moisture detectors*

USE **moisture meters**

### moisture meters

UF *moisture detectors*

GS measuring instruments

. **moisture meters**

. . hygrometers

. . . psychrometers

RT

chemical analysis  
humidity  
humidity measurement

### moisture resistance

RT caulking

coatings  
hydrophobicity  
hydrothermal stress analysis  
hygroscopicity  
porosity  
∞ resistance  
sealing  
waterproofing  
weatherproofing

### Mojave Desert (CA)

GS land

. deserts

. . **Mojave Desert (CA)**

RT

arid lands  
California  
desertification  
remote regions

*MOL (orbital laboratories)*

USE **manned orbital laboratories**

*MOLABS*

USE **lunar mobile laboratories**

∞ **moild**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT Aspergillus

fungi

molds

rhizopus

rust fungi

### moildavite

GS rocks

. igneous rocks

. . obsidian

. . . **moildavite**

RT

glass  
meteorites

- soils
- molding materials**  
 GS **molding materials**  
 . sheet molding compounds  
 RT binders (materials)  
 casting  
 clays  
 cores  
 injection molding  
 ∞ materials  
 molds  
 plasters  
 plastics  
 resin transfer molding  
 sand casting  
 sands  
 tenite
- Moldova**  
*(added September 1994)*  
 GS nations  
 . **Moldova**  
 RT Europe
- molds**  
 SN (EXCLUDES ORGANISMS)  
 RT casting  
 castings  
 dies  
 flat patterns  
 foundries  
 ingots  
 injection molding  
 mandrels  
 melting  
 ∞ mold  
 molding materials  
 organic materials  
 ∞ patterns  
 preforms  
 pressing (forming)  
 punches  
 resin transfer molding  
 sheet molding compounds  
 tablets  
 templates
- molecular absorption**  
 GS energy absorption  
 . radiation absorption  
 . . **molecular absorption**  
 RT ∞ absorption  
 atmospheric attenuation  
 Beer law  
 electromagnetic absorption  
 light transmission
- molecular beam epitaxy**  
 DEF Ultrahigh vacuum technique for growing very thin epitaxial layers of semiconductor crystals.  
 GS growth  
 . crystal growth  
 . . epitaxy  
 . . . **molecular beam epitaxy**  
 RT atomic layer epitaxy  
 indium aluminum arsenides
- molecular beams**  
 GS beams (radiation)  
 . particle beams  
 . . neutral beams  
 . . . **molecular beams**  
 RT atomic beams  
 atomic clocks  
 free molecular flow  
 ion beams  
 molecules  
 rarefied gas dynamics
- molecular biology**  
 GS life sciences  
 . **molecular biology**  
 RT biochemistry  
 ∞ biology  
 eukaryotes  
 gene expression  
 genes  
 physiochemistry
- prokaryotes  
 proteome  
 self assembly
- molecular bonds*  
 USE **chemical bonds**
- molecular chains**  
 RT ∞ aliphatic compounds  
 chains  
 crystal lattices  
 macromolecules  
 monomers  
 netting (materials/structures)
- molecular clouds**  
 DEF Thickest and densest interstellar clouds consisting mainly of molecular hydrogen but also a high concentration of dust grains.  
 RT astronomical models  
 ∞ clouds  
 cosmic dust  
 diffuse interstellar bands  
 galactic halos  
 hydrogen clouds  
 infrared cirrus (astronomy)  
 interstellar chemistry  
 interstellar gas  
 interstellar masers  
 interstellar matter  
 laboratory astrophysics  
 methylidyne  
 star formation  
 Submillimeter Wave Astronomy  
 Satellite
- molecular clusters**  
*(added January 1994)*  
 GS **molecular clusters**  
 . micelles  
 RT agglomeration  
 atomic clusters  
 chemisorption  
 clumps  
 ∞ clusters  
 fullerenes  
 metal clusters  
 nanoclusters  
 nucleation
- molecular collisions**  
 GS collisions  
 . **molecular collisions**  
 particle interactions  
 . molecular interactions  
 . . **molecular collisions**  
 RT atomic collisions  
 BGK model  
 ∞ interactions  
 particle collisions  
 rigid rotors (plasma physics)
- molecular diffusion**  
 GS diffusion  
 . **molecular diffusion**  
 RT atmospheric diffusion  
 diffusion coefficient  
 diffusion waves  
 dissociation  
 gaseous diffusion  
 gaseous self-diffusion  
 particle diffusion  
 self diffusion (solid state)  
 surface diffusion
- molecular dissociation*  
 USE **dissociation**
- molecular dynamics**  
*(added January 1994)*  
 RT computerized simulation  
 crystal structure  
 ∞ dynamics  
 embedded atom method  
 microstructure  
 molecular interactions  
 ∞ molecular physics  
 molecular properties  
 molecular trajectories  
 physical chemistry
- statistical mechanics
- molecular electronics**  
 GS electrophysics  
 . **molecular electronics**  
 RT adatoms  
 DTL integrated circuits  
 ∞ electronics  
 integrated circuits  
 Langmuir-Blodgett films  
 large scale integration  
 linear integrated circuits  
 medium scale integration  
 microelectronics  
 microminiaturization  
 miniature electronic equipment  
 monomolecular films  
 pi-electrons  
 semiconductor devices  
 thin films  
 TTL integrated circuits  
 very large scale integration
- molecular energy levels**  
 GS level (quantity)  
 . energy levels  
 . . **molecular energy levels**  
 . . . intermolecular forces  
 . . . rotational states  
 . . . vibrational states  
 molecular properties  
 . **molecular energy levels**  
 . . intermolecular forces  
 . . rotational states  
 . . vibrational states  
 RT chemical energy  
 ∞ energy  
 energy of formation  
 excimers  
 free energy  
 heat of solution  
 internal energy  
 ∞ nuclear energy
- molecular excitation**  
 GS excitation  
 . **molecular excitation**  
 RT atomic excitations  
 energy levels  
 ionization  
 particle collisions  
 photoexcitation  
 rotational spectra  
 rotational states  
 vibrational states
- molecular flow**  
 SN (FLOW WITH KNUDSEN NUMBERS GREATER THAN 0. 01--FOR SPECIFIC FLOWS IN THIS RANGE USE NARROWER TERMS--FOR DUCTED MOLECULAR FLOW USE KNUDSEN FLOW)  
 DEF The flow of gas through a duct under conditions such that the mean free path is greater than the largest dimension of a transverse section of the duct.  
 GS fluid flow  
 . gas flow  
 . . **molecular flow**  
 . . . slip flow  
 . . . transition flow  
 RT BGK model  
 boundary layer transition  
 continuum flow  
 Knudsen flow  
 low density flow  
 rarefied gas dynamics  
 transpiration
- molecular gases**  
 GS gases  
 . **molecular gases**  
 . . polar gases  
 . . polyatomic gases  
 . . . diatomic gases  
 RT association reactions  
 gas dynamics  
 monatomic gases  
 nonpolar gases  
 rarefied gases

## molecular interactions

- real gases
    - . . Raman spectra
    - . . rotational spectra
    - . . vibrational spectra
    - . . molecular structure
    - . . molecular weight
    - . . low molecular weights
  - molecular interactions**
    - GS particle interactions
      - . **molecular interactions**
      - . . molecular collisions
    - RT association reactions
    - configuration interaction
    - dissociation
    - ∞ interactions
      - intermolecular forces
      - internuclear properties
      - interstellar chemistry
      - ionic reactions
      - Lennard-Jones potential
      - mass flow
      - molecular dynamics
    - ∞ molecular physics
    - molecular properties
    - transport theory
  - molecular ions**
    - GS ions
      - . **molecular ions**
      - . . formyl ions
      - . . hydronium ions
      - . . vanadyl radical
    - RT amino radical
    - electron affinity
    - ∞ molecular physics
    - positive ions
  - molecular orbitals**
    - GS molecular properties
      - . **molecular orbitals**
      - orbitals
      - . **molecular orbitals**
      - wave functions
      - . **molecular orbitals**
    - RT quantum chemistry
    - self consistent fields
  - molecular oscillations**
    - GS molecular properties
      - . **molecular oscillations**
      - oscillations
      - . **molecular oscillations**
    - RT argon lasers
    - carbon dioxide lasers
    - carbon monoxide lasers
    - gas lasers
    - oscillator strengths
  - molecular oscillators**
    - GS oscillators
      - . **molecular oscillators**
    - RT lasers
    - masers
    - oscillator strengths
    - two-wavelength lasers
    - ultraviolet lasers
  - ∞ **molecular physics**
    - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
    - RT internuclear properties
    - Mayer problem
    - molecular dynamics
    - molecular interactions
    - molecular ions
    - monatomic molecules
    - ∞ physics
    - ∞ science
  - molecular properties**
    - (added April 2004)
    - DEF Fundamental information regarding molecules such as weight, structure, rotation, vibration, spectra, etc.
    - GS **molecular properties**
      - . molecular energy levels
      - . . intermolecular forces
      - . . rotational states
      - . . vibrational states
      - . molecular orbitals
      - . molecular oscillations
      - . molecular relaxation
      - . molecular rotation
      - . molecular spectra
      - . . electronic spectra
  - molecular pumps**
    - GS pumps
      - . vacuum pumps
      - . . **molecular pumps**
      - vacuum apparatus
      - . vacuum pumps
      - . . **molecular pumps**
    - RT plasma pumping
    - pump seals
  - molecular relaxation**
    - UF *chemical relaxation*
    - vibrational relaxation*
    - GS molecular properties
      - . **molecular relaxation**
    - RT gas flow
    - population inversion
    - ∞ relaxation
      - relaxation (mechanics)
      - relaxation time
      - shock waves
      - thermodynamics
      - vibration damping
      - vibrational spectra
  - molecular rotation**
    - GS gyration
      - . rotation
      - . . **molecular rotation**
      - molecular properties
      - . **molecular rotation**
    - RT microwave spectra
    - Raman spectra
    - rigid rotors (plasma physics)
    - rotational spectra
  - molecular shields**
    - DEF Furlable devices used in space vacuum research to permit deployment and retrieval of instruments and the performance of experiments without contamination.
    - RT contamination
    - high vacuum
    - instrument packages
    - spaceborne experiments
  - molecular sieves*
  - USE **absorbents**
  - molecular spectra**
    - GS molecular properties
      - . **molecular spectra**
      - . . electronic spectra
      - . . Raman spectra
      - . . rotational spectra
      - . . vibrational spectra
      - spectra
      - . **molecular spectra**
      - . . electronic spectra
      - . . Raman spectra
      - . . rotational spectra
      - . . vibrational spectra
    - RT absorption spectra
    - electromagnetic spectra
    - emission spectra
    - energy spectra
    - infrared spectra
    - mass spectra
    - microwave spectra
    - oxygen spectra
    - solar spectra
    - stellar spectra
    - Swan bands
    - ultraviolet spectra
    - Vegard-Kaplan bands
    - visible spectrum
  - molecular spectroscopy**
    - GS spectroscopy
      - . **molecular spectroscopy**
      - . . Raman spectroscopy
  - RT absorption spectra
  - electron spectroscopy
  - emission spectra
  - infrared spectroscopy
  - line spectra
  - microwave spectra
  - optogalvanic spectroscopy
  - rotational spectra
  - spectroscopic analysis
  - ultraviolet spectroscopy
  - vacuum spectroscopy
  - x ray spectroscopy
- molecular structure**
  - GS molecular properties
    - . **molecular structure**
  - RT atomic interactions
  - atomic structure
  - biopolymer denaturation
  - complex compounds
  - configuration interaction
  - coordination number
  - crystal lattices
  - enantiomers
  - hydrogen bonds
  - infrared spectroscopy
  - intermolecular forces
  - intramolecular structures
  - macromolecules
  - molecules
  - monatomic molecules
  - nuclear magnetic resonance
  - nuclear models
  - order-disorder transformations
  - polyatomic molecules
  - polywater
  - self assembly
  - ∞ structures
  - unimolecular structures
  - Wiswesser notations
- molecular theory**
  - RT Lighthill gas model
  - ∞ theories
- molecular trajectories**
  - GS trajectories
    - . **molecular trajectories**
  - RT gas flow
  - molecular dynamics
- molecular weight**
  - DEF The weight of a given molecule expressed in atomic weight units.
  - GS molecular properties
    - . **molecular weight**
    - . . low molecular weights
  - RT macromolecules
  - molecules
  - monatomic molecules
  - polyatomic molecules
  - weight (mass)
- molecules**
  - DEF Aggregates of two or more atoms of a substance that exists as a unit. Used for macromolecules.
  - GS **molecules**
    - . macromolecules
    - . . dendrimers
    - . . monatomic molecules
    - . . polyatomic molecules
    - . . diatomic molecules
    - . . triatomic molecules
  - RT atoms
  - buckminsterfullerene
  - chemical bonds
  - ∞ chemical compounds
  - ions
  - low molecular weights
  - molecular beams
  - molecular structure
  - molecular weight
- moles**
  - GS animals
    - . vertebrates
    - . . mammals

- ... moles
- Moliere formula*
- USE **cosmic ray showers**  
**secondary cosmic rays**  
**spatial distribution**
- Mollier diagram**
- UF *enthalpy-entropy diagrams*
- GS charts
  - . graphs (charts)
  - . . **Mollier diagram**
  - diagrams
  - . **Mollier diagram**
- RT enthalpy  
entropy  
equations of state  
ideal fluids  
isentropic  
thermodynamics
- mollusks**
- GS animals
  - . invertebrates
  - . . **mollusks**
  - . . . cephalopods
  - . . . octopuses
  - . . . snails
- RT shellfish
- Molniya satellites**
- GS artificial satellites
  - . communication satellites
  - . . **Molniya satellites**
  - . Soviet satellites
  - . . **Molniya satellites**
- RT electric discharges  
radio relay systems  
satellite networks  
telecommunication  
television transmission  
U.S.S.R. space program
- molten carbonate fuel cells**  
*(added December 1995)*
- GS electric generators
  - . direct power generators
  - . . fuel cells
  - . . . **molten carbonate fuel cells**
  - electrochemical cells
  - . fuel cells
  - . . **molten carbonate fuel cells**
- RT carbonates  
molten salt electrolytes
- molten salt electrolytes**
- GS conductors
  - . electrolytes
  - . . **molten salt electrolytes**
- RT molten carbonate fuel cells
- molten salt nuclear reactors**
- UF *MSRE reactors*
- GS nuclear reactors
  - . **molten salt nuclear reactors**
- RT  $\infty$  reactors
- molten salts**
- DEF High temperature inorganic salt or mixtures of salts used for thermal energy storage, heat exchangers, high power electric batteries, heat treatment of alloys, etc.
- RT halides  
halites  
inorganic compounds  
nitrides  
salt baths
- $\infty$  salts  
sodium chlorides
- molting**
- RT phenology  
shedding
- molybdates**
- GS molybdenum compounds
  - . **molybdates**
  - . . lead molybdates
- molybdenum**
- GS chemical elements
- . **molybdenum**
- metals
- . refractory metals
- . . **molybdenum**
- . transition metals
- . . **molybdenum**
- refractory materials
- . refractory metals
- . . **molybdenum**
- RT molybdenum isotopes
- molybdenum alloys**
- GS alloys
  - . heat resistant alloys
  - . . refractory metal alloys
  - . . . **molybdenum alloys**
  - . . . . Rene 41
  - . . . . Rene 63
  - . . . . Rene 77
  - . . . . Rene 95
  - refractory materials
  - . refractory metal alloys
  - . . **molybdenum alloys**
  - . . . Rene 41
  - . . . Rene 63
  - . . . Rene 77
  - . . . Rene 95
- RT Hastelloy (trademark)  
mulberry (alloy)  
Permalloys (trademark)  
stainless steels
- molybdenum carbides**
- GS carbon compounds
  - . carbides
  - . . **molybdenum carbides**
- molybdenum compounds**
- GS **molybdenum compounds**
  - . molybdates
  - . . lead molybdates
  - . molybdenum disulfides
  - . molybdenum oxides
- RT  $\infty$  chemical compounds  
 $\infty$  Group 6B compounds  
 $\infty$  metal compounds
- molybdenum disulfides**
- GS chalcogenides
  - . sulfides
  - . . inorganic sulfides
  - . . . molybdenum sulfides
  - . . . . **molybdenum disulfides**
  - molybdenum compounds
  - . **molybdenum disulfides**
  - sulfur compounds
  - . sulfides
  - . . inorganic sulfides
  - . . . molybdenum sulfides
  - . . . . **molybdenum disulfides**
- molybdenum isotopes**
- GS chemical elements
  - . nuclides
  - . . isotopes
  - . . . **molybdenum isotopes**
- RT molybdenum
- molybdenum oxides**
- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **molybdenum oxides**
  - molybdenum compounds
  - . **molybdenum oxides**
- molybdenum sulfides**
- GS chalcogenides
  - . sulfides
  - . . inorganic sulfides
  - . . . **molybdenum sulfides**
  - . . . . molybdenum disulfides
  - sulfur compounds
  - . sulfides
  - . . inorganic sulfides
  - . . . **molybdenum sulfides**
  - . . . . molybdenum disulfides
- MOM (semiconductors)**
- UF *metal-oxide-metal semiconductors*
- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . **MOM (semiconductors)**
  - semiconductors (materials)
  - . **MOM (semiconductors)**
- RT ion implantation
- moment distribution**
- GS distribution (property)
  - . **moment distribution**
- RT angular distribution  
force distribution  
influence coefficient  
loading moments  
loads (forces)  
mass distribution  
method of moments  
moments  
moments of inertia  
pressure distribution  
static loads  
stress concentration  
structural analysis  
structural design criteria
- moments**
- GS **moments**
  - . bending moments
  - . dipole moments
  - . . electric moments
  - . . magnetic moments
  - . distribution moments
  - . . mean
  - . . orthogonality
  - . . standard deviation
  - . loading moments
  - . moments of inertia
  - . stability derivatives
  - . . pitching moments
  - . . rolling moments
  - . . yawing moments
  - . torque
- RT method of moments  
mode (statistics)  
moment distribution  
momentum  
skewness  
torsion  
variance (statistics)
- moments of inertia**
- UF *inertia moments*
- GS moments
  - . **moments of inertia**
- RT angular momentum  
center of gravity  
center of pressure  
centroids  
equations of motion  
Euler equations of motion  
inertia  
inertia principle  
Mach inertia principle  
mass  
mass distribution  
moment distribution  
pitching moments  
rolling moments  
stability derivatives  
stress analysis  
structural strain  
torque  
yawing moments
- momentum**
- DEF Quantity of motion.
- GS **momentum**
  - . angular momentum
  - . transverse momentum
- RT classical mechanics  
de Broglie wavelengths
- $\infty$  dynamics  
moments
- $\infty$  motion  
motion aftereffects  
pendulums



## momentum theory

turning flight

*momentum energy*

USE **kinetic energy**

### momentum theory

RT conservation laws  
Newton second law  
∞ theories

### momentum transfer

RT ∞ dynamics  
energy transfer  
gas-liquid interactions  
hydrodynamic ram effect  
kinetic theory  
kinetics  
Prandtl number  
transferring

### Monaco

GS nations  
. **Monaco**  
RT Europe

### monatomic gases

UF *atomic gases*  
GS gases  
. **monatomic gases**  
RT Chapman-Enskog theory  
molecular gases  
rare gases  
real gases

### monatomic molecules

GS molecules  
. **monatomic molecules**  
RT atoms  
chemical bonds  
∞ chemical compounds  
ions  
low molecular weights  
∞ molecular physics  
molecular structure  
molecular weight  
positive ions

### monaural signals

RT audio equipment  
audio frequencies  
auditory perception  
auditory signals  
loudspeakers  
microphones  
sound transmission

### monazite sands

GS phosphorus compounds  
. phosphates  
. . **monazite sands**  
sediments  
. sands  
. . **monazite sands**  
soils  
. sands  
. . **monazite sands**  
RT minerals  
sedimentary rocks

### Monel (trademark)

GS alloys  
. nickel alloys  
. . **Monel (trademark)**

### Monge-Ampere equation

GS algebra  
. nonlinear equations  
. . **Monge-Ampere equation**  
analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . elliptic differential equations  
. . . . . **Monge-Ampere equation**  
. . nonlinear equations  
. . . **Monge-Ampere equation**  
RT boundary value problems  
∞ equations

### Mongolia

GS nations

### . Mongolia

RT Asia

### monitors

RT aircraft instruments  
analyzers  
conical scanning  
counters  
data recorders  
∞ detectors  
display devices  
environmental monitoring  
gas detectors  
helmet mounted displays  
in-flight monitoring  
∞ instruments  
∞ measurement  
measuring instruments  
optical scanners  
pollution monitoring  
radiation measuring instruments  
scanning  
warning  
warning systems

### monkeys

GS animals  
. vertebrates  
. . mammals  
. . . primates  
. . . . **monkeys**

### monochromatic radiation

SN (LIMITED TO ELECTROMAGNETIC RADIATION)  
GS electromagnetic radiation  
. **monochromatic radiation**  
RT beams (radiation)  
Brillouin effect  
coherent electromagnetic radiation  
coherent light  
∞ filters  
gamma rays  
infrared radiation  
ionizing radiation  
light (visible radiation)  
long wave radiation  
monochromatization  
monochromators  
polarized electromagnetic radiation  
polarized light  
∞ radiation  
radio waves  
short wave radiation  
ultraviolet radiation  
x rays

### monochromatization

UF *interference monochromatization*  
RT monochromatic radiation  
particle energy  
polarization (waves)

### monochromators

GS measuring instruments  
. **monochromators**  
radiation sources  
. **monochromators**  
RT comparators  
duochromators  
goniometers  
light sources  
monochromatic radiation  
optical equipment  
optical measuring instruments  
photogoniometers  
spectrophotometers

### monocoque structures

RT ∞ cylinders  
shells (structural forms)  
stressed-skin structures  
∞ structures

### monocrystals

USE **single crystals**

### monocular vision

GS vision  
. **monocular vision**  
RT human factors engineering

motion perception

perception

space perception

### monocytes

(added August 2004)

DEF Large, phagocytic mononuclear leukocytes produced in the vertebrate bone marrow and released into the blood; contain a large, oval or somewhat indented nucleus surrounded by voluminous cytoplasm and numerous organelles.

GS cells (biology)

. blood cells

. . leukocytes

. . . **monocytes**

RT biocompatibility  
blood cell count  
bone marrow  
cytology  
erythrocytes  
immune systems

### monoethanolamine (MEA)

GS organic compounds  
. amines  
. . **monoethanolamine (MEA)**

### monoids

GS algebra  
. group theory  
. . homomorphisms  
. . . **monoids**

### monolithic circuits

USE **integrated circuits**

### monomers

DEF Low molecular weight substances consisting of molecules capable of reacting with like or unlike molecules to form a polymer.

RT dibasic compounds

dimers

molecular chains

oligomers

oxetane polymers

∞ polymers

prepolymers

trimers

### monomethylhydrazines

(added February 2001)

UF *MMH (chemistry)*

GS hydrazines

. methylhydrazine

. . **monomethylhydrazines**

RT dimethylhydrazines  
hydrazine engines  
hypergolic rocket propellants  
liquid rocket propellants

### monomolecular films

UF *Langmuir monolayers*

GS thin films

. **monomolecular films**

. . Langmuir-Blodgett films

RT energy absorption films

∞ films

integrated optics

∞ layers

molecular electronics

self assembly

surface layers

surfactants

thin layer chromatography

### monoplanes

GS **monoplanes**  
. A-1 aircraft  
. A-2 aircraft  
. A-3 aircraft  
. A-4 aircraft  
. A-5 aircraft  
. A-6 aircraft  
. A-7 aircraft  
. A-37 aircraft  
. AN-22 aircraft  
. AN-24 aircraft  
. Argosy MK-1 aircraft  
. AVRO 707 aircraft

- . B-26 aircraft
- . B-47 aircraft
- . B-50 aircraft
- . B-52 aircraft
- . B-57 aircraft
- . B-58 aircraft
- . B-66 aircraft
- . B-70 aircraft
- . BAC 111 aircraft
- . Beechcraft 18 aircraft
- . Boeing 707 aircraft
- . Boeing 720 aircraft
- . Boeing 733 aircraft
- . Boeing 737 aircraft
- . Boeing 757 aircraft
- . Boeing 767 aircraft
- . Breguet 940 aircraft
- . Breguet 941 aircraft
- . Breguet 1150 aircraft
- . Buccaneer aircraft
- . C-2 aircraft
- . C-33 aircraft
- . C-35 aircraft
- . C-46 aircraft
- . C-47 aircraft
- . C-54 aircraft
- . C-118 aircraft
- . C-121 aircraft
- . C-123 aircraft
- . C-124 aircraft
- . C-130 aircraft
- . C-131 aircraft
- . C-133 aircraft
- . C-135 aircraft
- . C-140 aircraft
- . C-141 aircraft
- . C-160 aircraft
- . Canberra aircraft
- . Cessna 172 aircraft
- . Cessna 205 aircraft
- . Cessna 210 aircraft
- . Cessna 402B aircraft
- . Cessna L-19 aircraft
- . CL-41 aircraft
- . CL-44 aircraft
- . Comet 4 aircraft
- . CV-340 aircraft
- . CV-440 aircraft
- . CV-880 aircraft
- . CV-990 aircraft
- . D-558 aircraft
- . DC 3 aircraft
- . DC 7 aircraft
- . DC 8 aircraft
- . DH 112 aircraft
- . DH 115 aircraft
- . DH 121 aircraft
- . DH 125 aircraft
- . DHC 2 aircraft
- . DHC 4 aircraft
- . DHC 5 aircraft
- . DO-27 aircraft
- . DO-28 aircraft
- . DO-31 aircraft
- . Electra aircraft
- . F-2 aircraft
- . F-4 aircraft
- . F-5 aircraft
- . F-8 aircraft
- . F-9 aircraft
- . F-17 aircraft
- . F-27 aircraft
- . F-28 transport aircraft
- . F-84 aircraft
- . F-86 aircraft
- . F-89 aircraft
- . F-94 aircraft
- . F-100 aircraft
- . F-102 aircraft
- . F-104 aircraft
- . F-105 aircraft
- . F-106 aircraft
- . FD 2 aircraft
- . G-1 aircraft
- . G-91 aircraft
- . G-95/4 aircraft
- . G-222 aircraft
- . GA-5 aircraft
- . H-126 aircraft
- . HFB-320 aircraft
- . HP-115 aircraft
- . HS-748 aircraft
- . IL-14 aircraft
- . IL-62 aircraft
- . jet provost aircraft
- . Jindivik target aircraft
- . L-29 jet trainer
- . Lockheed model 18 aircraft
- . MH-262 aircraft
- . Mirage aircraft
- . . Mirage 3 aircraft
- . Boeing 717 aircraft
- . Mystere 20 aircraft
- . Nord 1500 aircraft
- . OV-1 aircraft
- . OV-10 aircraft
- . P-3 aircraft
- . P-51 aircraft
- . P-166 aircraft
- . P-308 aircraft
- . P-1127 aircraft
- . P-1154 aircraft
- . PD-808 aircraft
- . S-2 aircraft
- . S-3 aircraft
- . Saab 105 aircraft
- . SC-1 aircraft
- . SC-5 aircraft
- . SC-7 aircraft
- . Scimitar aircraft
- . SE-210 aircraft
- . Shackleton bomber
- . T-2 aircraft
- . T-28 aircraft
- . T-33 aircraft
- . T-37 aircraft
- . T-38 aircraft
- . T-39 aircraft
- . TS-11 aircraft
- . TSR-2 aircraft
- . TU-104 aircraft
- . TU-124 aircraft
- . TU-134 aircraft
- . U-2 aircraft
- . U-10 aircraft
- . Valiant aircraft
- . VC-10 aircraft
- . Victor MK-1 aircraft
- . Viscount aircraft
- . VJ-101 aircraft
- . X-1 aircraft
- . X-2 aircraft
- . X-3 aircraft
- . X-5 aircraft
- . X-13 aircraft
- . X-14 aircraft
- . X-21 aircraft
- . X-21A aircraft
- . X-31 aircraft
- . XC-142 aircraft
- . XV-4 aircraft
- . XV-5 aircraft
- . YS-11 aircraft
- . Z-37 aircraft
- RT aerodynamic configurations
- ∞ aircraft
- airfoils
- biplanes
- cargo aircraft
- gliders
- ∞ low wing aircraft
- seaplanes
- tailless aircraft
- water takeoff and landing aircraft
- wing planforms
- wing profiles
- ∞ winged vehicles
- monopole antennas**
- UF *spike antennas*
- GS antennas
- . omnidirectional antennas
- . . . **monopole antennas**
- . . . whip antennas
- RT antenna design
- dipole antennas
- loop antennas
- monopoles
- ∞ spikes
- monopoles**
- GS **monopoles**
- . magnetic monopoles
- RT ∞ dipoles
- monopole antennas
- multipoles
- ∞ poles
- monopropellants**
- GS propellants
- . rocket propellants
- . . liquid rocket propellants
- . . . **monopropellants**
- RT aircraft fuels
- chemical fuels
- gaseous rocket propellants
- gelled rocket propellants
- metal propellants
- plastic propellants
- propellant decomposition
- slurry propellants
- solid rocket propellants
- monopulse antennas**
- GS antennas
- . **monopulse antennas**
- RT directional antennas
- phased arrays
- waveguide antennas
- monopulse radar**
- GS radar
- . Doppler radar
- . . pulse Doppler radar
- . . . **monopulse radar**
- . pulse radar
- . . pulse Doppler radar
- . . . **monopulse radar**
- RT Doppler radar
- duplexers
- radar tracking
- tracking radar
- monosaccharides**
- GS organic compounds
- . carbohydrates
- . . sugars
- . . . **monosaccharides**
- . . . . hexoses
- . . . . . galactose
- . . . . . glucose
- . . . . . pentose
- . . . . . ribose
- . . . . . xylose
- monoscopes**
- GS electron tubes
- . vacuum tubes
- . . cathode ray tubes
- . . . **monoscopes**
- television equipment
- . **monoscopes**
- RT camera tubes
- electron beams
- image tubes
- secondary emission
- ∞ test equipment
- monostable multivibrators**
- GS circuits
- . multivibrators
- . . **monostable multivibrators**
- monotectic alloys**
- DEF Metallic composite materials having a dispersed phase of solidification products distributed within a matrix. The dispersed components can be selected to provide characteristics such as superconductivity or lubricity.
- GS alloys
- . **monotectic alloys**
- RT composite materials
- ∞ matrices
- metal matrix composites
- metals
- monotone functions**
- GS functions (mathematics)

## monotony

- . **monotone functions**
- RT analysis (mathematics)  
calculus  
real variables

### monotony

- RT boredom  
lethargy  
sensory deprivation

### monsoons

DEF Seasonal winds caused primarily by the greater annual variation in air temperature over large land surfaces compared to ocean surfaces though other factors like land-relief are important.

- GS wind (meteorology)  
. **monsoons**
- RT annual variations  
atmospheric circulation  
ground wind  
Madden-Julian Oscillation  
precipitation (meteorology)  
sea breeze

### Montana

- GS nations  
. United States  
. . **Montana**
- RT Bighorn Mountains (MT-WY)  
Missouri River (US)  
Williston Basin (North America)  
Yellowstone National Park  
(ID-MT-WY)

### Monte Carlo method

- GS analysis (mathematics)  
. numerical analysis  
. . **Monte Carlo method**
- RT diffusion theory  
expectancy hypothesis  
game theory  
Markov chains  
mathematical models
- ∞ methodology  
probability theory  
random processes  
random walk  
renormalization group methods  
simulation  
statistical analysis  
stochastic processes  
transport theory

### Monterey Bay (CA)

- GS bays (topographic features)  
. **Monterey Bay (CA)**
- RT California  
Pacific Ocean

### month

DEF The period of the revolution of the Moon around the Earth. The month is designated as sidereal, tropical, anomalistic, draconic, or synodical, according to whether the revolution is relative to the stars, the vernal equinox, the perigee, the ascending node, of the sun. The calendar month, which is a rough approximation of the synodical month. Used for lunation.

- UF *lunation*
- RT calendars  
time  
units of measurement

### monticellite

- GS calcium compounds  
. **monticellite**  
magnesium compounds  
. **monticellite**  
minerals  
. **monticellite**  
silicon compounds  
. silicates  
. . **monticellite**
- RT olivine

### montmorillonite

DEF A group of monoclinic silicate clay minerals with widely varying compositions, and characterized by swelling in water.

- UF *smectite*
- GS aluminum compounds  
. aluminum silicates  
. . **montmorillonite**  
clays  
. **montmorillonite**  
minerals  
. **montmorillonite**  
silicon compounds  
. silicates  
. . aluminum silicates  
. . . **montmorillonite**
- RT bentonite

### moods

- RT emotional factors  
emotions  
melatonin  
psychological effects  
psychological factors  
sensory feedback

### moon

- DEF The natural satellite of the Earth.
- GS celestial bodies  
. natural satellites  
. . **moon**
- RT Earth-Moon system  
light sources  
lunar atmosphere  
lunar bases  
lunar communication  
lunar composition  
lunar craters  
lunar crust  
lunar dust  
lunar eclipses  
lunar environment  
lunar evolution  
lunar exploration  
lunar far side  
lunar geology  
lunar gravitation  
lunar landing sites  
lunar limb  
lunar luminescence  
lunar magnetic fields  
lunar maps  
lunar occultation  
lunar orbits  
lunar phases  
lunar photography  
lunar rays  
lunar shadow  
lunar soil  
lunar temperature  
lunar topography  
selenography  
selenology  
terraforming

### moon illusion

- GS psychological effects  
. illusions  
. . **moon illusion**
- RT optical illusion  
sensory feedback

### moon-Earth trajectories

- GS trajectories  
. spacecraft trajectories  
. . lunar trajectories  
. . . **moon-Earth trajectories**
- RT Apollo 5 flight  
Apollo 6 flight  
Apollo 7 flight  
Apollo 8 flight  
Apollo 10 flight  
Apollo 11 flight  
Apollo 12 flight  
Apollo 13 flight  
Apollo 14 flight  
Apollo 15 flight  
Apollo 16 flight  
Apollo 17 flight  
circumlunar trajectories  
Earth-Moon trajectories  
Goddard Trajectory Determination  
System  
lunar flight

- mass drivers  
orbital mechanics  
reentry trajectories  
round trip trajectories  
transfer orbits

### moonlets

- (added July 1989)
- GS celestial bodies  
. **moonlets**
- RT Jupiter rings  
natural satellites  
planetary rings  
Saturn rings  
Uranus rings

### moonquakes

- GS seismology  
. **moonquakes**
- RT lunar geology  
lunar tides  
planetary quakes  
selenology

### moons

- USE **natural satellites**

### mooring

- UF *moorings*
- RT airports  
anchors (fasteners)  
autonomous docking  
docking  
fasteners
- ∞ joining  
materials handling  
multiple docking adapters  
spacecraft docking

### moorings

- USE **mooring**

### MOPS (propulsion systems)

- USE **man operated propulsion systems**

### moraines

- USE **glacial drift**

### morale

- RT creativity  
disciplining  
leadership  
motivation  
productivity  
psychology  
recreation

### Morehouse comet

- GS celestial bodies  
. comets  
. . **Morehouse comet**
- RT solar system

### MORL

- USE **manned orbital laboratories**

### morning

- RT daytime  
sunrise

### Morocco

- GS nations  
. **Morocco**
- RT Africa

### morphine

- GS bases (chemical)  
. alkaloids  
. . **morphine**  
drugs  
. narcotics  
. . **morphine**  
nitrogen compounds  
. alkaloids  
. . **morphine**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . alkaloids

. . . . **morphine**  
**morphological indexes**  
 GS ratios  
 . indexes (ratios)  
 . . **morphological indexes**  
 RT morphology

**morphology**  
 GS **morphology**  
 . crystal morphology  
 . geomorphology  
 . isomorphism  
 . lung morphology  
 . polymorphism  
 RT anatomy  
 ∞ biology  
 differentiation (biology)  
 geology  
 histology  
 ∞ mathematics  
 morphological indexes  
 shapes  
 vestibules

*morphotropism*  
 USE **isomorphism**

**Morse code**  
 RT ∞ codes  
 communicating  
 keying  
 radio telegraphy  
 telecommunication

**Morse potential**  
 RT diatomic molecules  
 kinetic theory  
 potential energy

**mortality**  
 RT aging (biology)  
 death  
 expiration  
 life span  
 Mills ratio

**mortars (material)**  
 RT admixtures  
 bricks  
 cements  
 ceramics  
 concretes  
 grout  
 masonry  
 plasters  
 refractories

*MOS (Japanese spacecraft)*  
 USE **Japanese spacecraft**

*MOS (semiconductors)*  
 USE **metal oxide semiconductors**

**mosaics**  
 RT assemblies  
 diffraction  
 focal plane devices  
 photographs

**Moscow**  
 GS cities  
 . **Moscow**  
 RT Russian Federation  
 U.S.S.R.

*MOSFET*  
 USE **field effect transistors**

*MOSS (space stations)*  
 USE **space stations**

**Mossbauer effect**  
 RT crystal lattices  
 ∞ effects  
 electromagnetic absorption  
 fluorescence  
 gamma rays  
 laser induced fluorescence  
 resonance scattering

resonant frequencies

*mosses*  
 USE **Bryophytes**

*MOT (orbital telescopes)*  
 USE **manned orbital telescopes**

**moths**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . **moths**  
 . . . . . silkworms  
 RT bollworms  
 infestation

*motility*  
 USE **locomotion**

∞ **motion**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF The act, process or instance of change of position. Also called movement, especially when used in connection with problems involving the motion of one craft relative to another. Used for movement.

UF *movement*  
 GS **motion**  
 . proper motion  
 RT acceleration (physics)  
 attitude (inclination)  
 Brownian movements  
 coning motion  
 displacement  
 domain wall  
 gliding  
 gyration  
 harmonic motion  
 head movement  
 heaving  
 high acceleration  
 immobilization  
 inertia  
 ion motion  
 ionic mobility  
 kinematics  
 libration  
 librational motion  
 momentum  
 nutation  
 orbits  
 oscillations  
 oscillators  
 particle motion  
 particle trajectories  
 pitch (inclination)  
 rotation  
 Saccadic eye movements  
 solar orbits  
 spacecraft motion  
 spacecraft trajectories  
 stellar motions  
 swarming  
 teetering  
 transit time  
 translational motion  
 tumbling motion  
 turbulence  
 velocity  
 vertical motion  
 vertical motion simulators  
 vibration  
 viscosity  
 yaw

**motion aftereffects**  
 RT equations of motion  
 kinetics  
 momentum

*motion equations*  
 USE **equations of motion**

**motion perception**  
 GS perception  
 . **motion perception**  
 RT binocular vision

monocular vision  
 visual perception

**motion pictures**  
 UF *cinelfluorography*  
*cineradiography*  
 GS photographs  
 . **motion pictures**  
 RT animation  
 chronophotography  
 cinematography  
 computer animation  
 graphic arts  
 projectors  
 supplements  
 video equipment  
 video tapes

**motion sickness**  
 DEF The syndrome of pallor, sweating, nausea, and vomiting which is induced by unusual acceleration. Used for air sickness.  
 UF *air sickness*  
 GS sicknesses  
 . **motion sickness**  
 RT acceleration stresses (physiology)  
 aerospace medicine  
 dizziness  
 head movement  
 nausea  
 space adaptation syndrome  
 vomiting

**motion sickness drugs**  
 GS drugs  
 . **motion sickness drugs**  
 RT pharmacology

**motion simulation**  
 DEF Replication of exact motion or replication of part of a motion to provide the sensation of the motion.  
 GS simulation  
 . **motion simulation**  
 RT flight simulation  
 flight simulators  
 motion simulators  
 virtual reality

**motion simulators**  
 GS simulators  
 . **motion simulators**  
 RT computerized simulation  
 control simulation  
 flight simulators  
 motion simulation  
 space environment simulation  
 test facilities

**motion stability**  
 GS dynamic characteristics  
 . dynamic stability  
 . . **motion stability**  
 . . . aerodynamic stability  
 . . . aircraft stability  
 . . . hovering stability  
 . . . attitude stability  
 . . . . directional stability  
 . . . . . gyroscopic stability  
 . . . . lateral stability  
 . . . . longitudinal stability  
 . . . flow stability  
 . . . . boundary layer stability  
 . . . flame stability  
 . . . magnetohydrodynamic stability  
 . . . . Weibel instability  
 . . . Goertler instability  
 . . . Taylor instability  
 . . low speed stability  
 . . rotary stability  
 . . . gyroscopic stability  
 . . spacecraft stability  
 stability  
 . dynamic stability  
 . . **motion stability**  
 . . . aerodynamic stability  
 . . . aircraft stability  
 . . . hovering stability  
 . . . attitude stability  
 . . . directional stability

## motivation

- . . . . . gyroscopic stability
- . . . . . lateral stability
- . . . . . longitudinal stability
- . . . . . flow stability
- . . . . . boundary layer stability
- . . . . . flame stability
- . . . . . magnetohydrodynamic stability
- . . . . . Weibel instability
- . . . . . Goertler instability
- . . . . . Taylor instability
- . . . . . low speed stability
- . . . . . rotary stability
- . . . . . gyroscopic stability
- . . . . . spacecraft stability

RT combustion stability  
coning motion  
control stability  
dynamic tests  
roughness  
sea keeping  
spacecraft motion  
stable oscillations  
surface stability

## motivation

GS **motivation**  
. contract incentives

RT ∞ drives  
incentives  
learning  
morale  
reinforcement (psychology)  
self stimulation  
∞ stimuli

## motor skills

(added August 2004)  
USE **sensorimotor performance**

## motor systems (biology)

USE **efferent nervous systems**

## motor vehicles

DEF Automotive vehicles that do not run on rails, generally having rubber tires.

GS surface vehicles  
. **motor vehicles**  
. . . automated mixed traffic vehicles  
. . . automobiles  
. . . electric automobiles  
. . . electric motor vehicles  
. . . electric automobiles  
. . . tractors  
. . . crawler tractors  
. . . tracked vehicles  
. . . trucks  
. . . tank trucks

RT transportation  
∞ vehicles

## motors

SN (LIMITED TO MACHINES SUPPLIED WITH EXTERNAL ENERGY WHICH IS CONVERTED INTO FORCE AND/OR MOTION--SEE ENGINES FOR MACHINES WITH SELF-CONTAINED POWER SOURCES)

DEF Machines supplied with external energy which is converted into force and/or motion.

GS **motors**  
. electric motors  
. . . asynchronous motors  
. . . induction motors  
. . . micromotors  
. . . piezoelectric motors  
. . . stepping motors  
. . . synchronous motors  
. . . torque motors  
. . . servomotors

RT apogee boost motors  
∞ electric equipment  
energy conversion efficiency  
engines  
∞ generators  
hydraulic equipment

stators

MOTS (tracking system)  
USE **minitrack system**

## mountain inhabitants

GS communities  
. inhabitants  
. . **mountain inhabitants**  
altitude acclimatization  
high altitude environments  
low temperature environments

RT

## mountains

GS landforms  
. **mountains**  
. . Adirondack Mountains (NY)  
. . Alps Mountains (Europe)  
. . Andes Mountains (South America)  
. . Appalachian Mountains (North America)  
. . Bighorn Mountains (MT-WY)  
. . Black Hills (SD-WY)  
. . Carpathian Mountains (Europe)  
. . Cascade Range (CA-OR-WA)  
. . Caucasus Mountains (U.S.S.R.)  
. . coastal ranges (CA)  
. . Great Smoky Mountains (NC-TN)  
. . Himalayas  
. . Peninsular Ranges (CA)  
. . Pyrenees Mountains (Europe)  
. . Rocky Mountains (North America)  
. . San Juan Mountains (CO)  
. . Sierra Nevada Mountains (CA)  
. . Wind River Range (WY)  
. . Wrangell Mountains (AK)

RT Central Piedmont (US)  
cirques (landforms)  
cones (volcanoes)  
continents  
divides (landforms)  
formations  
gaps (geology)  
geomorphology  
highlands  
Mars volcanoes  
massifs  
mesas  
orography  
∞ peaks  
peaks (landforms)  
piedmonts  
Pike's Peak (CO)  
∞ ridges  
terraces (landforms)  
volcanoes  
volcanology  
watersheds

RT

**mounting**

GS **mounting**  
. rigid mounting

RT assembling  
∞ attachment  
brackets  
∞ joining  
suspending (hanging)

## mounts

USE **supports**

## mouth

GS anatomy  
. digestive system  
. . **mouth**  
. . . lips (anatomy)  
. . . face (anatomy)  
. . . **mouth**  
. . . lips (anatomy)

RT salivary glands  
teeth  
tongue

## movement

USE **motion**

## moving target indicators

DEF Radar devices that employ a technique that enhances the detection and display of moving radar targets by suppressing fixed targets.

Doppler processing is one method of implementation. Used for MTI indicators.

UF *MTI radar*  
GS radar  
. **moving target indicators**  
RT cancellation circuits  
coherent radar  
Doppler radar  
over-the-horizon radar  
radar cross sections  
radar tracking  
target acquisition

## Mozambique

GS nations  
. **Mozambique**  
RT Africa

## MPD thrusters

(added April 2001)  
USE **magnetoplasmadynamic thrusters**

## MPLM (International Space Station)

(added April 2005)  
USE **Multi-Purpose Logistics Modules**

## MPP (computers)

USE **massively parallel processors**

## MR-3 flight

USE **Mercury MR-3 flight**

## MRAC (systems)

USE **model reference adaptive control**

## MRCA aircraft

UF *multi-role combat aircraft*  
*Tornado aircraft*

RT ∞ aircraft  
attack aircraft  
fighter aircraft  
∞ military aircraft

## Mrkos comet

GS celestial bodies  
. comets  
. . **Mrkos comet**  
RT solar system

## MSAT

DEF A joint Canada/United States mobile satellite system which is being developed with a voice and data communication link between mobile units and the switched telephone network or between mobile units and other mobile units via satellite. Each country will have a satellite capable of mutual backup. Launch date is planned for 1994.

GS artificial satellites  
. communication satellites  
. . **MSAT**

RT ground stations  
land mobile satellite service  
maritime satellites  
mobile communication systems  
radio communication  
radio relay systems  
satellite transmission

## MSBLS

USE **microwave scanning beam landing system**

## MSM (semiconductors)

DEF Semiconductor devices consisting of a semiconductor layer sandwiched between two layers of metal. Used for metal-semiconductor-metal semiconductors.

UF *metal-semiconductor-metal semiconductors*

GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . **MSM (semiconductors)**

RT MIM diodes  
photodiodes  
Schottky diodes  
semiconductor junctions

SIS (semiconductors)

*MSRE reactors*  
USE **molten salt nuclear reactors**

*MSS (International Space Station)*  
(added September 2001)  
USE **Space Station Mobile Servicing System**

**MTBF**  
DEF The mean of the distribution of time (or cycles, miles, events) between successive failure. MTBF is often estimated by dividing the total operating time for like items by the total number of failures encountered. Used for mean time between failures.  
UF *mean time between failures*  
GS time  
. **MTBF**  
RT downtime  
failure analysis  
failure modes  
life (durability)  
rates (per time)  
reliability  
statistical analysis

*MTF*  
USE **modulation transfer function**

*MTFF (space station)*  
USE **man tended free flyers**

*MTI radar*  
USE **moving target indicators**

*MTPE*  
USE **Mission to Planet Earth**

*MUBIS (scanners)*  
USE **multiple beam interval scanners**

**mucocoles**  
GS cysts  
. **mucocoles**  
RT ∞ blisters

**mucus**  
GS body fluids  
. **mucus**  
RT saliva

**mud**  
GS sediments  
. **mud**  
soils  
. **mud**  
RT alluvium  
clays  
fans (landforms)  
grout  
ocean bottom  
rain erosion  
sludge  
tidal flats

**mufflers**  
RT acoustic retrofitting  
aircraft noise  
attenuators  
baffles  
damping  
∞ diffusers  
exhaust systems  
furnaces  
jet aircraft noise  
noise (sound)  
noise reduction  
propeller noise  
rocket engine noise  
silencers  
suppressors

**mulberry (alloy)**  
GS alloys  
. **mulberry (alloy)**  
RT antimony alloys

molybdenum alloys

**mullites**  
RT aluminum silicates  
minerals

*Multi-angle Imaging Spectroradiometer*  
(added May 2007)  
USE **MISR (radiometry)**

**multi-anode microchannel arrays**  
DEF A family of photoelectric, photon counting array detectors being developed for use in instruments on both ground based and spaceborne telescopes.  
GS arrays  
. **multi-anode microchannel arrays**  
RT anodes  
microchannels  
radiation detectors  
spaceborne telescopes  
telescopes  
x ray detectors

**multibeam antennas**  
DEF Antennas that have the ability to form more than one beam from a single radiating aperture.  
GS antennas  
. **multibeam antennas**  
RT beams (radiation)  
lens antennas  
microwave antennas  
reflector antennas  
satellite antennas  
satellite communication

**multiblock grids**  
(added May 1995)  
UF *multiple blocked grids*  
GS coordinates  
. computational grids  
. . . structured grids (mathematics)  
. . . **multiblock grids**  
RT computational fluid dynamics

**multichannel communication**  
GS telecommunication  
. **multichannel communication**  
RT code division multiple access  
interference factor table  
multiple access  
radio transmitters  
teleconferencing  
time division multiple access

*multichannel plates*  
USE **microchannel plates**

*multicharged ions*  
USE **ions**

**multidisciplinary design optimization**  
(added January 1995)  
DEF Methodology for the design of complex engineering systems and subsystems in which the synergistic effects of coupling between various interacting disciplines and phenomena are analyzed and exploited at every stage of the design process.  
GS optimization  
. **multidisciplinary design optimization**  
RT aircraft design  
architecture (computers)  
computer aided design  
design analysis  
genetic algorithms  
systems engineering  
Taguchi methods

**multidisciplinary research**  
(added January 1995)  
DEF Research by combining several (academic) disciplines or methods.  
GS research  
. **multidisciplinary research**  
RT concurrent engineering  
management methods  
operations research

project management  
research management

**multiengine vehicles**  
RT ∞ aircraft  
B-1 aircraft  
launch vehicles  
light transport aircraft  
missile configurations  
missiles  
multistage rocket vehicles  
recoverable launch vehicles  
rocket vehicles  
∞ vehicles

**multigrid methods**  
(added September 1989)  
DEF A numerical technique which attempts to accelerate the convergence of an iterative process by computing corrections to the solution on coarser meshes and propagating these changes to the fine mesh through interpolation.  
GS analysis (mathematics)  
. numerical analysis  
. . . approximation  
. . . **multigrid methods**  
RT computational fluid dynamics  
computational grids  
finite difference theory  
finite element method  
grid generation (mathematics)  
iteration  
iterative solution  
∞ methodology  
unstructured grids (mathematics)

**multilayer insulation**  
GS insulation  
. **multilayer insulation**  
interlayers  
. **multilayer insulation**  
RT composite materials  
cryogenic fluid storage  
fabrics  
∞ foils  
foils (materials)  
laminates  
∞ layers  
metal foils  
ply orientation  
sandwich structures  
∞ sheets

*multilayer structures*  
USE **laminates**

*multiloop systems*  
USE **cascade control**

**multimedia**  
(added March 1993)  
UF *hypermedia*  
*interactive multimedia*  
*intermedia*  
RT audio visual equipment  
audio visual material  
computer graphics  
electronic publishing  
graphic arts  
imaging techniques  
information systems  
teleconferencing  
training devices  
video communication  
video data  
video tape recorders  
video tapes  
visual aids  
voice communication

**multimission modular spacecraft**  
DEF Future spacecraft to be operated in conjunction with the Space Shuttle orbiter vehicle and serviced by its module exchange mechanism. Used for MMS.  
UF *MMS*  
RT BESS (satellite)  
Landsat follow-on missions  
satellite networks

## multimode resonators

Solar Maximum Mission

### multimode resonators

GS resonators  
. **multimode resonators**  
RT cavity resonators  
magnetrons  
propagation modes

### multipactor discharges

GS electric current  
. electric discharges  
. . . **multipactor discharges**  
RT linear accelerators  
photomultiplier tubes  
secondary emission  
spark gaps

### multipath transmission

DEF The process, or condition, in which radiation travels between source and receiver via more than one path. Since there can be only one direct path, some process of reflection, refraction or scattering must be involved.

GS transmission  
. electromagnetic wave transmission  
. . . radio transmission  
. . . . **multipath transmission**  
. signal transmission  
. . . radio transmission  
. . . . **multipath transmission**  
RT cepstral analysis  
diffraction paths  
Fermat principle  
multistatic radar  
optical paths  
 $\infty$  paths  
radio waves  
Rayleigh fading  
sound transmission  
wave propagation

### multiphase flow

UF *mixed flow*  
GS fluid flow  
. **multiphase flow**  
. . . two phase flow  
RT conical flow  
critical flow  
Crocco-Lee theory  
flow distortion  
flow measurement  
gas flow  
laminar flow  
liquid flow  
mass flow  
orifice flow  
pipe flow  
pressure gradients  
single-phase flow  
solids flow  
steady flow  
steam flow  
subcritical flow  
supercritical flow  
turbulent flow  
uniform flow  
unsteady flow

### multiphoton absorption

DEF Ionization and dissociation of a molecule under the action of powerful laser radiation. Laser-flux dependent light intensities emitted by different excited states of the molecule indicate the various absorption processes.

GS energy absorption  
. radiation absorption  
. . . electromagnetic absorption  
. . . . **multiphoton absorption**  
RT  $\infty$  absorption  
photon absorptiometry

### multiple access

DEF The allocation of communication system resources (output) among multiple users by means of power, bandwidth, and power assignment singly or in combination.

GS telecommunication  
. **multiple access**  
. . . Aloha system

. . carrier sense multiple access  
. . code division multiple access  
. . demand assignment multiple access  
. . frequency division multiple access  
. . time division multiple access  
transmission  
. signal transmission  
. . data transmission  
. . . **multiple access**  
. . . . Aloha system  
. . . . carrier sense multiple access  
. . . . code division multiple access  
. . . . demand assignment multiple access  
. . . . frequency division multiple access  
. . . . time division multiple access  
RT access control  
frequency division multiplexing  
multichannel communication  
packet switching  
pulse communication  
wideband communication

### multiple beam interval scanners

UF *MUBIS (scanners)*  
GS antennas  
. **multiple beam interval scanners**  
RT linear arrays  
radar scanning

### multiple blocked grids

USE **multiblock grids**

### multiple docking adapters

UF *MDA*  
GS adapters  
. **multiple docking adapters**  
RT airlock modules  
docking  
mooring  
orbital rendezvous  
Saturn 1 workshop  
Saturn 5 workshop  
Saturn workshops  
Skylab 1  
Skylab 2  
Skylab 3  
Skylab 4  
spacecraft docking

### multiple frequency radar

USE **multispectral radar**

### multiple input multiple output

USE **MIMO (control systems)**

### multiple instruction multiple data stream

USE **MIMD (computers)**

### multiple output programs

GS computer programs  
. **multiple output programs**  
RT multiprogramming  
readout  
time sharing

### multiple target tracking

(added August 1991)

DEF The process of following movements of several targets simultaneously.

GS tracking (position)  
. **multiple target tracking**  
RT optical tracking  
radar targets  
radar tracking  
target acquisition  
target recognition  
targets  
tracking filters

tracking problem

### multiple target trajectory systems

USE **MATTS (systems)**

### multiplets

USE **fine structure**

### multiplex transmission

USE **multiplexing**

### multiplexers

USE **multiplexing**

### multiplexing

DEF The simultaneous transmission of two or more signals within a single channel. The three basic methods of multiplexing involve the separation of signals by time division, frequency division, and phase division. Used for multiplex transmission and multiplexers.

UF *multiplex transmission multiplexers*

GS transmission

#### . multiplexing

. . code division multiplexing  
. . frequency division multiplexing  
. . time division multiplexing  
. . wavelength division multiplexing

RT access control

carrier frequencies  
code division multiple access  
data transmission  
demultiplexing  
frequency division multiple access  
pulse communication  
radio transmission  
satellite transmission  
signal transmission

### multiplication

GS number theory

#### . multiplication

RT arithmetic

computation  
fringe multiplication

### multiplier phototubes

USE **photomultiplier tubes**

### multipliers

DEF Devices which have two or more inputs and whose output is a representation of the product of the quantities represented by the input signals.

GS **multipliers**

. channel multipliers

RT Lagrange multipliers

logic circuits  
photomultiplier tubes

### multipolar fields

RT continuum mechanics  
field theory (physics)  
gravitational fields  
magnetic fields  
multipoles

### multipoles

RT monopoles  
multipolar fields

### multiprocessing (computers)

GS data processing  
. **multiprocessing (computers)**  
RT associative processing (computers)  
computers  
concurrent processing  
Connection Machine  
data processing equipment  
distributed memory  
hypercube multiprocessors  
interprocessor communication  
multiprogramming  
parallel programming  
pipelining (computers)  
real time operation  
supercomputers  
time sharing

vector processing (computers)

terrain analysis

RT remote sensing

**multiprogramming**

- UF *multitasking (computers)*
- GS computer programming
- . **multiprogramming**
- RT machine-independent programs
- multiple output programs
- multiprocessing (computers)
- pipelining (computers)
- ∞ programming
- time sharing

*multipropellants*

USE **rocket propellants**

**Multi-Purpose Logistics Modules**

(added March 2005)

DEF Pressurized logistics modules built by the Italian Space Agency ASI for NASA to transport systems and experiment racks, and resupply/stowage items to and from the International Space Station (ISS) in the cargo bay of the Space Shuttle. Also known as MPLM.

- UF *Donatello Logistics Module (ISS)*
- Leonardo Logistics Module (ISS)*
- MPLM (International Space Station)*
- Raffaello Logistics Module (ISS)*
- GS modules
- . service modules
- . . **Multi-Purpose Logistics Modules**
- . space station modules
- . . **Multi-Purpose Logistics Modules**
- spacecraft components
- . service modules
- . . **Multi-Purpose Logistics Modules**
- RT cargo
- International Space Station
- payload delivery (STS)
- Space Shuttle payloads
- spaceborne experiments
- spacecraft docking modules

*multiradar tracking*

USE **radar networks**

*multi-role combat aircraft*

USE **MRCAs aircraft**

**multiscale models**

(added November 2002)

DEF Models or simulations that effectively address phenomena across significantly different scales.

- GS models
- . **multiscale models**
- RT computerized simulation
- mathematical models
- scale effect
- scale models

**multisensor applications**

- GS **multisensor applications**
- . multisensor fusion
- RT enhanced vision
- image processing
- imaging techniques
- intercalibration
- pattern recognition
- remote sensing
- remote sensors

**multisensor fusion**

(added October 1994)

DEF A combination of data or images from more than one sensor source (or from multispectral sensors) for display as a single image.

- UF *data fusion*
- sensor fusion*
- GS multisensor applications
- . **multisensor fusion**
- RT data integration
- fuzzy systems
- imaging techniques
- remote sensing
- robotics
- signal processing

**multispectral band cameras**

- GS optical equipment
- . cameras
- . . **multispectral band cameras**
- photographic equipment
- . cameras
- . . **multispectral band cameras**
- RT infrared photography
- photography

**multispectral band scanners**

- GS optical equipment
- . optical scanners
- . . **multispectral band scanners**
- . . . thematic mappers (LANDSAT) scanners
- . optical scanners
- . . **multispectral band scanners**
- . . . thematic mappers (LANDSAT)
- RT band ratioing
- change detection
- Coastal Zone Color Scanner
- Earth observations (from space)
- imaging techniques
- infrared scanners
- ocean color scanner
- panoramic scanning
- photography
- radiometric correction
- radiometric resolution
- scanning
- spaceborne photography
- spectral reconnaissance
- vegetative index

**multispectral linear arrays**

DEF Large number of interconnected solid state detectors in a pushbroom mode wherein the forward motion of the vehicle (spacecraft) sweeps the assembly of detectors which are oriented perpendicular to the ground track. Used for MLA.

- UF *MLA*
- GS arrays
- . antenna arrays
- . . linear arrays
- . . . **multispectral linear arrays**
- electronic equipment
- . solid state devices
- . . **multispectral linear arrays**
- spacecraft instruments
- . satellite instruments
- . . **multispectral linear arrays**
- RT ∞ detectors
- ∞ sensors

**multispectral photography**

- GS imagery
- . photography
- . . **multispectral photography**
- . . . infrared photography
- . . . . color infrared photography
- . . . radar photography
- RT change detection
- crop identification
- Earth observations (from space)
- I2S cameras
- image resolution
- imaging techniques
- spectral reconnaissance

**multispectral radar**

- UF *dual frequency radar*
- multiple frequency radar*
- GS radar
- . **multispectral radar**
- RT imagery
- imaging techniques
- spectral reconnaissance

**Multispectral Resource Sampler**

DEF An experimental remote sensing instrument for satellites to measure both intensity and polarization at several wavelengths. The first one was launched in the late 1980s.

- GS artificial satellites
- . **Multispectral Resource Sampler**

**multispectral tracking telescopes**

- GS telescopes
- . spectroscopic telescopes
- . . **multispectral tracking telescopes**
- RT optical measuring instruments
- optical tracking
- tracking (position)

*multistage compressors*

USE **turbocompressors**

**multistage rocket vehicles**

DEF Vehicles having two or more rocket units, each unit firing after the one in back of it has exhausted its propellant. Normally, each unit, or stage, is jettisoned after completing its firing.

- GS rocket vehicles
- . **multistage rocket vehicles**
- . . Ablestar launch vehicle
- . . Antares rocket vehicle
- . . Argo rocket vehicles
- . . Astrobe rocket vehicles
- . . . Astrobee 1500 rocket vehicle
- . . Athena rocket vehicle
- . . Atlas launch vehicles
- . . . Atlas Able 5 launch vehicle
- . . . Atlas Agena B launch vehicle
- . . . Atlas Agena launch vehicles
- . . . Atlas Centaur launch vehicle
- . . . Atlas SLV-3 launch vehicle
- . . Berenice rocket vehicle
- . . Black Knight rocket vehicle
- . . Blue Scout rocket vehicle
- . . Diamant launch vehicle
- . . Eldo launch vehicle
- . . EXOS sounding rocket
- . . Jaguar rocket vehicle
- . . Javelin rocket vehicle
- . . Juno launch vehicles
- . . . Juno 1 launch vehicle
- . . . Juno 2 launch vehicle
- . . Jupiter C rocket vehicle
- . . . Kappa rocket vehicles
- . . . Kappa 8 rocket vehicle
- . . . Kappa 9 rocket vehicle
- . . . Lambda rocket vehicles
- . . Little Joe 2 launch vehicle
- . . Nike rocket vehicles
- . . . Nike-Apache rocket vehicle
- . . . Nike-Cajun rocket vehicle
- . . . Nike-Hydac rocket vehicle
- . . . Nike-Iroquois rocket vehicle
- . . . Nike-Javelin rocket vehicle
- . . . Nike-Tomahawk rocket vehicle
- . . Nova launch vehicles
- . . Pegasus air-launched booster
- . . Phoenix sounding rocket
- . . RAM B launch vehicle
- . . Rubis rocket vehicle
- . . Saturn launch vehicles
- . . . Saturn 1 launch vehicles
- . . . . Saturn 1 SA-1 launch vehicle
- . . . . Saturn 1 SA-10 launch vehicle
- . . . . Saturn 1 SA-2 launch vehicle
- . . . . Saturn 1 SA-3 launch vehicle
- . . . . Saturn 1 SA-4 launch vehicle
- . . . . Saturn 1 SA-5 launch vehicle
- . . . . Saturn 1 SA-6 launch vehicle
- . . . . Saturn 1 SA-7 launch vehicle
- . . . . Saturn 1 SA-8 launch vehicle
- . . . . Saturn 1 SA-9 launch vehicle
- . . . Saturn 1B launch vehicles
- . . . Saturn 2 launch vehicles
- . . . Saturn 5 launch vehicles
- . . . Saturn D launch vehicle
- . . Scout launch vehicle
- . . Skylark rocket vehicle
- . . Thor launch vehicles
- . . . Thor Able rocket vehicle
- . . . Thor Agena launch vehicle
- . . . Thor Delta launch vehicle
- . . Titan launch vehicles
- . . . Titan 3 launch vehicle
- . . . Titan 4 launch vehicle
- . . . . Titan 4B launch vehicle
- . . Ares 1 launch vehicle



## multistatic radar

- . . vanguard 2 launch vehicle
- . . Vega launch vehicle
- . . WASP sounding rocket
- . . . Ares 1 first stage
- . . . Ares 1 upper stage
- . . Ares 5 cargo launch vehicle
- RT air launching
- expendable stages (spacecraft)
- interim stages (spacecraft)
- launch vehicles
- Minuteman ICBM
- multiengine vehicles
- Navaho missile
- payload mass ratio
- Pershing missile
- piggyback systems
- polaris missiles
- propulsive efficiency
- rocket engines
- SS-11 missile
- stage separation
- Sunblazer space probe
- Talos missile
- terrier missile
- Titan ICBM
- Trailblazer 1 reentry vehicle
- Trailblazer 2 reentry vehicle
- upper stage rocket engines
- ∞ vehicles

### multistatic radar

DEF System in which successive lobes of the antenna are sequentially engaged to provide a tracking capability without physical movement of the antenna. Used for bistatic radar.

UF *bistatic radar*

GS radar

- . Doppler radar
- . . **multistatic radar**
- . surveillance radar
- . . **multistatic radar**

RT multipath transmission  
pulse radar  
radar detection  
target recognition

### multitasking (computers)

USE **multiprogramming**

### multitemporal analysis

USE **temporal resolution**

### multivariable control

(added July 1991)

RT ∞ control  
control theory  
feedback control  
linear parameter-varying control  
optimal control

### multivariate statistical analysis

GS statistical analysis  
. variance (statistics)  
. . **multivariate statistical analysis**  
. . . bivariate analysis  
. . . covariance  
. . . orthogonality  
. . . regression analysis  
. . . regression coefficients

RT ∞ analyzing  
correlation  
discriminant analysis (statistics)  
∞ variance

### multivibrators

DEF Two-stage regenerative circuits with two possible states and an abrupt transition characteristic.

GS circuits

- . **multivibrators**
- . . flip-flops
- . . monostable multivibrators

RT amplifiers  
bistable circuits  
logic circuits  
oscillators  
positive feedback  
switching circuits

trigger circuits

### muon spin rotation

DEF Particle spin depolarization caused by sensitivity of muon spin to the presence of defects in certain metals.

GS gyration  
. rotation

. . **muon spin rotation**

RT charged particles  
hyperfine structure  
muons  
particle diffusion  
particle spin  
precession

### muonium

RT electrons  
mesons

### muons

GS particles  
. elementary particles  
. . bosons  
. . . mesons  
. . . . **muons**  
. . fermions  
. . . leptons  
. . . . **muons**  
. . hadrons  
. . . mesons  
. . . . **muons**  
. . nuclear particles  
. . bosons  
. . . mesons  
. . . . **muons**  
RT baryons  
charged particles  
electron decay rate  
muon spin rotation

### Murchison meteorite

GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . carbonaceous meteorites  
. . . . carbonaceous chondrites  
. . . . . **Murchison meteorite**  
. . . chondrites  
. . . . carbonaceous chondrites  
. . . . . **Murchison meteorite**

### Murray meteorite

GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . carbonaceous meteorites  
. . . . carbonaceous chondrites  
. . . . . **Murray meteorite**  
. . . chondrites  
. . . . carbonaceous chondrites  
. . . . . **Murray meteorite**

### muscle cells

(added December 2004)

DEF Mature contractile cells, commonly known as myocytes, that form one of three kinds of muscle. The three types of muscle cells are skeletal (muscle fibers), cardiac, and smooth. They are derived from embryonic (precursor) muscle cells called myoblasts.

UF *myocytes*

GS cells (biology)  
. **muscle cells**  
. . muscle fibers

RT muscles  
muscular function  
musculoskeletal system  
myoelectricity  
myosins  
smooth muscle

### muscle contraction

(added August 2004)

USE **muscular function**

### muscle fibers

(added August 2004)

DEF Large, multinucleate single cells, either cylindrical or prismatic in shape, that form the

basic unit of skeletal muscle tissue. They consist of a soft contractile substance enclosed in a tubular sheath.

UF *skeletal myocytes*

GS cells (biology)

- . muscle cells
- . . **muscle fibers**

RT muscles  
musculoskeletal system  
myosins  
skeletal muscle

### muscle relaxants

GS drugs

- . **muscle relaxants**

### muscles

GS anatomy  
. musculoskeletal system  
. . **muscles**  
. . . constrictors  
. . . diaphragm (anatomy)  
. . . flexors  
. . . myocardium  
. . . skeletal muscle  
. . . smooth muscle  
. . . tendons

RT aldolase  
ataxia  
congeners  
convulsions  
electrocardiography  
fibrillation  
glucocorticoids  
heart  
hypodynamia  
muscle cells  
muscle fibers  
muscular fatigue  
muscular strength  
muscular tonus  
myoelectric potentials  
myoelectricity  
myoglobin  
myosins  
spasms  
twitching

### muscovite

DEF An important mineral of the mica group.

GS aluminum compounds

- . **muscovite**
- . chalcogenides
- . oxides
- . . silicon oxides
- . . . **muscovite**
- . minerals
- . mica
- . . **muscovite**
- . silicon compounds
- . silicon oxides
- . . **muscovite**

### muscular fatigue

GS fatigue (biology)

- . **muscular fatigue**

RT muscles  
musculoskeletal system  
stress (physiology)

### muscular function

UF *muscle contraction*

GS **muscular function**

- . spasms

RT cramps

∞ functions

- . hypodynamia
- . hypokinesia
- . hypotonia
- . mechanograms
- . muscle cells
- . myosins
- . smooth muscle
- . twitching

### muscular strength

RT muscles

- . musculoskeletal system
- . skeletal muscle

∞ strength

### muscular tonus

UF *tonus*  
 GS **muscular tonus**  
 . hypotonia  
 RT exercise physiology  
 muscles

### musculoskeletal system

UF *skeleton*  
 GS anatomy  
 . **musculoskeletal system**  
 . . bones  
 . . . femur  
 . . . pelvis  
 . . . scapula  
 . . . skull  
 . . . . cranium  
 . . . . . intracranial cavity  
 . . . . mastoids  
 . . . spine  
 . . . . vertebrae  
 . . . sternum  
 . . . tibia  
 . . . ulna  
 . . joints (anatomy)  
 . . . elbow (anatomy)  
 . . . knee (anatomy)  
 . . . wrist  
 . . muscles  
 . . . constrictors  
 . . . diaphragm (anatomy)  
 . . . flexors  
 . . . myocardium  
 . . . skeletal muscle  
 . . . smooth muscle  
 . . . tendons  
 . . cartilage  
 RT connective tissue  
 exoskeletons  
 hypokinesia  
 intervertebral disks  
 muscle cells  
 muscle fibers  
 muscular fatigue  
 muscular strength  
 sciatic region  
 striation  
 ∞ systems

### museums

RT anthropology  
 artifacts  
 buildings  
 collection  
 histories  
 libraries

### mushy zones

DEF Regions of liquid plus solid phases in alloys that solidify over a range of temperatures. Used for liquid plus solid zones.  
 UF *liquid plus solid zones*  
 RT casting  
 cooling  
 metallography  
 phase transformations  
 solidification

### music

RT arts  
 octaves

### muskegs

GS landforms  
 . **muskegs**  
 RT Arctic regions  
 marshlands  
 soils  
 topography  
 water

### Mustang aircraft

USE **P-51 aircraft**

### mutagenesis

(added June 2000)  
 DEF Induction or development of a genetic mutation via a natural environmental mutagen or through the methods of genetic engineering.  
 RT deoxyribonucleic acid  
 gene expression  
 genes  
 mutagens  
 mutations  
 radiation effects

### mutagens

DEF Agents that raise the frequency of mutations above the spontaneous rate.  
 RT air pollution  
 biochemistry  
 biological evolution  
 cells (biology)  
 chemical analysis  
 genetics  
 mutagenesis  
 mutations

### mutations

RT biological diversity  
 biological evolution  
 cells (biology)  
 chromosome aberrations  
 chromosomes  
 genes  
 genetics  
 mitosis  
 mutagenesis  
 mutagens  
 nucleogenesis  
 oncogenes  
 radiation hazards

### MX missile

DEF United States strategic intercontinental ballistic missile.  
 UF *Peacekeeper missile*  
 GS missiles  
 . ballistic missiles  
 . . intercontinental ballistic missiles  
 . . . **MX missile**  
 . surface to surface missiles  
 . . intercontinental ballistic missiles  
 . . . **MX missile**  
 RT missile silos

### myelin

RT fats  
 lipids  
 myelin sheath  
 nerves  
 nervous system  
 neurons

### myelin sheath

(added August 2004)  
 DEF The lipid-rich sheath surrounding axons in both the central and peripheral nervous systems. The myelin sheath is an electrical insulator and allows faster and more energetically efficient conduction of impulses. The sheath is formed by the cell membranes of glial cells ( schwann cells in the peripheral and oligodendroglia in the central nervous system).  
 GS anatomy  
 . nervous system  
 . . nerves  
 . . . **myelin sheath**  
 RT axons  
 bioelectricity  
 electrophysiology  
 myelin  
 nerve fibers

### Mylar (trademark)

GS polymeric films  
 . **Mylar (trademark)**  
 RT polyethylene terephthalate  
 ∞ polymers

### myocardial infarction

GS diseases  
 . heart diseases  
 . . infarction  
 . . . **myocardial infarction**  
 RT arteriosclerosis  
 blood coagulation  
 coronary artery disease  
 hypertension  
 necrosis  
 thrombosis

### myocardium

GS anatomy  
 . circulatory system  
 . . cardiovascular system  
 . . . heart  
 . . . . **myocardium**  
 . musculoskeletal system  
 . . muscles  
 . . . **myocardium**  
 RT angina pectoris  
 heart conduction system

### myocytes

(added December 2004)  
 USE **muscle cells**

### myoelectric potentials

GS myoelectricity  
 . **myoelectric potentials**  
 RT muscles  
 ∞ potential

### myoelectricity

GS **myoelectricity**  
 . myoelectric potentials  
 RT electromyography  
 muscle cells  
 muscles

### myoglobin

GS biopolymers  
 . proteins  
 . . **myoglobin**  
 organic compounds  
 . proteins  
 . . **myoglobin**  
 RT muscles  
 pigments

### myopia

RT vision

### myosins

(added August 2004)  
 DEF A diverse superfamily of proteins that function as translocating proteins. They share the common characteristics of being able to bind actins and hydrolyse MgATP. Myosins generally consist of heavy chains which are involved in locomotion, and light chains which are involved in regulation.  
 GS biopolymers  
 . proteins  
 . . **myosins**  
 organic compounds  
 . proteins  
 . . **myosins**  
 RT adenosine triphosphate  
 adenosinetriphosphatase  
 muscle cells  
 muscle fibers  
 muscles  
 muscular function

### Mystere 20 aircraft

UF *Dassault Mystere 20 aircraft*  
 GS Dassault aircraft  
 . **Mystere 20 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Mystere 20 aircraft**  
 light aircraft  
 . **Mystere 20 aircraft**  
 monoplanes  
 . **Mystere 20 aircraft**

## Mystere 50 aircraft

passenger aircraft  
· **Mystere 20 aircraft**  
transport aircraft  
· **Mystere 20 aircraft**

### **Mystere 50 aircraft**

DEF A tri-engine business jet aircraft (Das-

sault). Used for Dassault Mystere 50 aircraft.

UF *Dassault Mystere 50 aircraft*

GS Dassault aircraft  
· **Mystere 50 aircraft**  
jet aircraft

· **Mystere 50 aircraft**  
passenger aircraft

· **Mystere 50 aircraft**  
transport aircraft  
· **Mystere 50 aircraft**  
RT ∞ aircraft  
turbofan engines

# N

## N electrons

- GS particles
  - . charged particles
  - . . . energetic particles
  - . . . . electrons
  - . . . . . **N electrons**
  - . . . . . corpuscular radiation
  - . . . . . energetic particles
  - . . . . . electrons
  - . . . . . . **N electrons**
  - . . . . . . elementary particles
  - . . . . . . fermions
  - . . . . . . leptons
  - . . . . . . . electrons
  - . . . . . . . . **N electrons**
- RT beta particles

## N-156 aircraft

- USE **F-5 aircraft**

## NA-300 aircraft

- USE **OV-10 aircraft**

## nacelle wing configurations

- (added August 1998)
- USE **wing nacelle configurations**

## nacelles

- RT aerodynamic configurations
  - air intakes
  - airframes
  - cowlings
  - ducted bodies
  - engine inlets
  - external store separation
  - external stores
  - external tanks
  - fairings
  - housings
  - nose inlets
  - perforated shells
  - Pods (external stores)
  - protuberances
  - shells (structural forms)
  - wing-fuselage stores

## Naiad

- (added January 1996)

DEF A natural satellite of Neptune orbiting at a mean distance of 48,000 kilometers.

- GS celestial bodies
  - . natural satellites
  - . . Neptune satellites
  - . . . **Naiad**
- RT Neptune (planet)

## naked singularities

DEF Singularities in spacetime that will be visible and communicable to the outside world, i.e., singularities that are not shielded by an event horizon from infinity.

- GS analysis (mathematics)
  - . complex variables
  - . . singularity (mathematics)
  - . . . **naked singularities**

- RT astrophysics
  - black holes (astronomy)
  - cosmology
  - degenerate matter
  - event horizon
  - gravitational collapse
  - points (mathematics)
  - relativity
  - space-time functions
  - theoretical physics
  - white holes (astronomy)

## nakhlites

- (added August 1991)

DEF Achondritic stony meteorites consisting of a holocrystalline aggregate of diopside (75 percent) and olivine.

- GS celestial bodies
  - . meteorites
  - . . stony meteorites
  - . . . achondrites
  - . . . . **nakhlites**

- RT chassignites
- shergottites

## SNC meteorites

## NAMC aircraft

- USE **Nihon aircraft**

## Namibia

- UF *South West Africa*
- RT Africa
  - nations
  - Republic of South Africa

## naming

- GS **naming**
  - . norms
- RT nomenclatures
  - specifications
  - standardization

## nanoclusters

- (added December 2006)

DEF Groups of well-ordered, uniform nanoparticles arranged in technologically useful shapes, often displaying optical, electronic, and chemical properties of interest.

- GS nanostructures (devices)
  - . **nanoclusters**
- RT metal clusters
  - molecular clusters
  - nanocrystals
  - nanofabrication
  - nanotechnology

## nanocomposites

- (added December 2000)

- GS composite materials
  - . **nanocomposites**
- RT aluminum oxides
  - ceramic matrix composites
  - grain size
  - nanocrystals
  - nanostructure (characteristics)
  - particulate reinforced composites
  - polymer matrix composites
  - silicon carbides
  - silicon nitrides

## nanocrystalline materials

- (added October 1997)

USE **nanocrystals**

## nanocrystalline structure

- (added October 1997)

USE **nanostructure (characteristics)**

## nanocrystals

- (added October 1997)

- UF *nanocrystalline materials*
- GS crystals
  - . **nanocrystals**
- RT crystal structure
  - grain size
  - microcrystals
  - nanoclusters
  - nanocomposites
  - nanoparticles
  - nanorods
  - nanostructure (characteristics)

## nanofabrication

- (added January 2002)

DEF Process of, and techniques for, creating nanoscale structures and devices.

- UF *nanofabrication*
- GS fabrication
  - . **nanofabrication**
- RT atomic force microscopy
  - electron beams
  - lithography
  - nanoclusters
  - nanorods
  - nanostructures (devices)
  - nanotechnology
  - nanowires
  - quantum electronics
  - scanning tunneling microscopy
  - self assembly

## nanointentation

- (added October 2001)

DEF A method for determining various mechanical properties of materials on a very small scale by observing an indentation made with a nanoscale diamond probe at a selected rate and load. Force-displacement curves derived from the indentation reflect a material's response to deformation, from which properties such as hardness and modulus of elasticity can be determined.

- GS indentation
  - . **nanointentation**
- RT atomic force microscopy
  - hardness tests
  - Knoop hardness
- ∞ materials tests
  - mechanical properties
  - microhardness
  - modulus of elasticity
  - nanotechnology

## nanoparticles

- (added March 2002)

DEF Ultra fine particles with dimensions in the range of 1 to 100 nanometers.

- GS particles
  - . **nanoparticles**
- RT fullerenes
  - nanocrystals
  - nanostructure (characteristics)
  - nanostructure growth
  - nanotechnology
  - nanotubes
  - thin films

## nanorods

- (added December 2006)

DEF Elongated nanoscale objects that may be synthesized from metals or semiconducting materials, each of their dimensions ranging from 1-100 nm.

- GS nanostructures (devices)
  - . **nanorods**
- RT nanocrystals
  - nanofabrication
  - nanotechnology
  - nanotubes
  - nanowires

## nanosatellites

- (added October 1998)

DEF Satellites with a total mass smaller than 10 kg incorporating miniaturized electronic and mechanical systems.

- UF *nanosats*
- GS artificial satellites
  - . **nanosatellites**
- RT microelectromechanical systems
  - microminiaturization
  - microminiaturized electronic devices
  - microsatellites
  - satellite constellations
  - satellite design
  - small satellite technology
  - small scientific satellites

## nanosats

- (added October 1998)

USE **nanosatellites**

## nanostructure (characteristics)

- (added October 1997)

UF *nanocrystalline structure*

- GS microstructure
  - . **nanostructure (characteristics)**
- RT carbon nanotubes
  - ∞ characteristics
  - crystal structure
  - dendrimers
  - grain size
  - micelles
  - nanocomposites
  - nanocrystals
  - nanoparticles
  - nanostructure growth
  - nanotechnology
  - nanotubes
  - self assembly

## nanostructure growth

semiconductors (materials)

*nanostructure fabrication*  
(added January 2002)  
USE **nanofabrication**

**nanostructure growth**  
(added September 2001)

DEF The progressive formation of nano-scale material structures by various means including catalytic formation, laser ablation, chemical vapor deposition, and plasma deposition.

GS growth

. **nanostructure growth**

RT crystal growth  
fullerenes  
laser ablation  
laser deposition  
nanoparticles  
nanostructure (characteristics)  
nanostructures (devices)  
nanotechnology  
nanotubes  
nanowires  
vapor deposition

**nanostructures (devices)**  
(added October 1997)

GS **nanostructures (devices)**

. nanotubes  
. quantum dots  
. . carbon nanotubes  
. nanowires  
. . quantum wires  
. graphene  
. nanoclusters  
. nanorods  
. single electron transistors

RT adatoms

∞ devices  
nanofabrication  
nanostructure growth  
nanotechnology  
quantum electronics  
semiconductor devices

**nanotechnology**  
(added June 2000)

DEF The creation of functional materials, devices, and systems through control of matter on the nanometer-length scale; exploitation of novel phenomena and properties at the nanometer scale.

GS technologies

. **nanotechnology**

RT adatoms  
carbon nanotube based memory  
graphene  
lab-on-a-chip devices  
microelectromechanical systems  
microelectronics  
nanoclusters  
nanofabrication  
nanoindentation  
nanoparticles  
nanorods  
nanostructure (characteristics)  
nanostructure growth  
nanostructures (devices)  
nanotubes  
nanowires  
quantum dots  
quantum electronics  
quantum wires  
resonant tunneling diodes  
self assembly  
single electron transistors

**nanotubes**

(added June 2000)

DEF Nanostructures having a closed, tubular morphology that can be single-walled or multi-walled. The structures are believed to be defect free, leading to high strength despite their low density; and can be either electrically conductive or semiconductive, depending on their helicity.

UF *nanotubules*

GS nanostructures (devices)

. **nanotubes**

. . carbon nanotubes  
RT fullerenes  
graphite  
nanoparticles  
nanorods  
nanostructure (characteristics)  
nanostructure growth  
nanotechnology  
∞ tubes

*nanotubules*  
(added June 2000)  
USE **nanotubes**

**nanowires**  
(added March 2005)

DEF Wire structures with thickness measured in nanometers (below 1 micron or  $1 \times 10^{(exp -6)}$  meters in thickness).

GS nanostructures (devices)

. **nanowires**

. . quantum wires  
RT nanofabrication  
nanorods  
nanostructure growth  
nanotechnology  
quantum electronics

**naphthalene**

GS organic compounds  
. cyclic compounds  
. . cyclic hydrocarbons  
. . . **naphthalene**  
. hydrocarbons  
. . cyclic hydrocarbons  
. . . **naphthalene**

**naphthenes**

GS organic compounds  
. cyclic compounds  
. . cyclic hydrocarbons  
. . . **naphthenes**  
. hydrocarbons  
. . cyclic hydrocarbons  
. . . **naphthenes**

**nap-of-the-earth navigation**

DEF Low altitude flight of helicopters during night or day utilizing electronic means for detection and recognition of landmarks and targets. Used for NOE navigation.

UF *NOE navigation*

GS navigation  
. air navigation  
. . **nap-of-the-earth navigation**  
. . . terrain following

RT helicopters  
image processing  
low altitude  
night flights (aircraft)  
night vision  
target recognition  
terrain analysis

*nappes*

USE **folds (geology)**

**narcolepsy**

GS diseases  
. **narcolepsy**

**narcosis**

DEF A state of profound stupor, produced by the toxic effect of certain substances; in diluent gas narcosis, by excessive partial pressure of the diluent.

GS unconsciousness

. **narcosis**

RT physiology  
∞ poisoning

**narcotics**

GS drugs  
. **narcotics**  
. . morphine  
RT pentobarbital  
phenobarbital

psychotropic drugs

**narrowband**

DEF A description of frequency measurement whose frequency band of energy is smaller relative to the rest of the band.

GS bandwidth

. **narrowband**

RT ∞ bands  
broadband  
frequencies

*NASA Communication Network*  
USE **NASCOM network**

*NASA End-to-End Data System*  
USE **needs (data system)**

**NASA Interactive Planning System**

UF *NIPS (system)*  
RT computer programs  
Earth resources  
management methods  
NASA programs  
project planning  
resource allocation  
resources management  
∞ systems

**NASA programs**

GS programs  
. **NASA programs**  
. . ACEE program  
. . Assess program  
. . ATLIT project  
. . DAST program  
. . NASA space programs  
. . . Apollo applications program  
. . . Apollo project  
. . . Bioastronautical Orbital Space System  
. . . Centaur project  
. . . Earth & Ocean Physics Applications Program  
. . . Earth Resources Program  
. . . Earth Resources Survey Program  
. . . . . SEASAT program  
. . . Echo project  
. . . Galileo project  
. . . Gemini project  
. . . Helios Project  
. . . Jupiter project  
. . . Magellan project (NASA)  
. . . Mariner program  
. . . . . Mariner Venus-Mercury 1973  
. . . . . Mariner-Mercury 1973  
. . . Mars 69 project  
. . . Mars 71 project  
. . . Mercury project  
. . . National Launch Vehicle Program  
. . . NEW MOONS project  
. . . Nimbus project  
. . . OPEN Project  
. . . Pioneer project  
. . . Project SETI  
. . . Ranger project  
. . . . . Agena B Ranger Program  
. . . Constellation program  
. . . Mars Surveyor 98 Program  
. . . New Horizons mission  
. . . Rover project  
. . . SAIL project  
. . . Saturn project  
. . . Scout project  
. . . Skylab program  
. . . Starprobe mission  
. . . Surveyor project  
. . . Synchronous Communications Satellite Proj  
. . . . . Tektite project  
. . . TIROS project  
. . . Titan project  
. . . Vanguard project  
. . . Viking Mars program  
. . . Voyager project  
. . . Mission to Planet Earth  
. . . National Aerospace Plane Program  
. . . quiet engine program  
. . . supersonic cruise aircraft research

- .. TACT program
  - .. Terminal Configured Vehicle Program
  - .. Tilt Rotor Research Aircraft Program
  - RT Advanced Launch System (STS)
  - AgRISTARS project
  - Apollo extension system
  - Canadian space program
  - Committee on Space Research
  - Communications Technology Satellite
  - Earth Resources Information System
  - GARP Atlantic Tropical Experiment
  - geographic applications program
  - Global Atmospheric Research Program
  - grants
  - Gravity Probe B
  - Landsat satellites
  - leasing
  - NASA Interactive Planning System
  - NASTRAN
  - NOESS
  - OSS-1 payload
  - payload deployment & retrieval system
  - Quasat
  - Questol aircraft
  - ∞ research projects
  - rotor systems research aircraft
  - SEASAT satellites
  - single stage to orbit vehicles
  - space programs
  - space transportation system
  - Spacelab
  - SPHINX
  - Starsite program
  - StormSat satellite
  - Synchronous Earth Observatory satellite
  - technology utilization
  - Transit navigation system
  - university program
- NASA space programs**
- GS programs
    - . NASA programs
    - .. **NASA space programs**
    - ... Apollo applications program
    - ... Apollo project
    - ... Bioastronautical Orbital Space System
    - ... Centaur project
    - ... Earth & Ocean Physics Applications Program
    - ... Earth Resources Program
    - ... Earth Resources Survey Program
    - ... SEASAT program
    - ... Echo project
    - ... Galileo project
    - ... Gemini project
    - ... Helios Project
    - ... Jupiter project
    - ... Magellan project (NASA)
    - ... Mariner program
    - ... Mariner Venus-Mercury 1973
    - ... Mariner-Mercury 1973
    - ... Mars 69 project
    - ... Mars 71 project
    - ... Mercury project
    - ... National Launch Vehicle Program
    - ... NEW MOONS project
    - ... Nimbus project
    - ... OPEN Project
    - ... Pioneer project
    - ... Project SETI
    - ... Ranger project
    - ... Agena B Ranger Program
    - ... Constellation program
    - ... Mars Surveyor 98 Program
    - ... New Horizons mission
    - ... Rover project
    - ... SAIL project
    - ... Saturn project
    - ... Scout project
    - ... Skylab program
    - ... Starprobe mission
    - ... Surveyor project
    - ... Synchronous Communications Satellite Proj
    - ... Tektite project
    - ... TIROS project
    - ... Titan project
    - ... Vanguard project
    - ... Viking Mars program
    - ... Voyager project
  - RT Advanced Launch System (STS)
  - Cassini mission
  - Cluster Mission
  - Comet Rendezvous Asteroid Flyby Mission
  - Deep Space 1 Mission
  - International Space Year
  - Kepler mission
  - manned Mars missions
  - Mars sample return missions
  - Mars Surveyor 2001 Mission
  - Next Generation Space Telescope project
  - Space Station Freedom
- NASA Structural Analysis program*
- USE **NASTRAN**
- NASCOM network**
- UF *NASA Communication Network*
  - GS communicating
    - . point to point communication
    - .. **NASCOM network**
    - networks
    - . communication networks
    - .. **NASCOM network**
  - RT Fleet Satellite Communication System
  - Global Tracking Network
  - radio communication
- telecommunication
- NASTRAN**
- UF *NASA Structural Analysis program*
  - GS computer programs
    - . applications programs (computers)
    - .. **NASTRAN**
  - RT bending moments
  - computer techniques
  - dynamic loads
  - finite element method
  - matrix methods
  - NASA programs
  - stress analysis
  - structural analysis
- National Aerospace Plane Program**
- GS programs
    - . NASA programs
    - .. **National Aerospace Plane Program**
  - RT aerospace planes
  - hypersonic vehicles
  - transatmospheric vehicles
  - X-30 vehicle
- National Airspace System**
- RT air traffic control
  - aircraft safety
  - airports
  - airspace
  - National Airspace Utilization System
  - National Aviation System
- National Airspace Utilization System**
- RT air law
  - air navigation
  - air traffic
  - air traffic control
  - aircraft approach spacing
  - airspace
  - collision avoidance
  - flight paths
  - flight plans
  - flight rules
  - National Airspace System
  - ∞ systems
- National Aviation System**
- RT air traffic
  - air traffic control
  - air transportation
  - aircraft approach spacing
  - flight rules
  - landing aids
  - National Airspace System
  - ∞ systems
  - traffic control
- National Launch Vehicle Program**
- GS programs
    - . NASA programs
    - .. NASA space programs
    - ... **National Launch Vehicle Program**
    - . space programs
    - .. NASA space programs
    - ... **National Launch Vehicle Program**
  - RT launch vehicles
  - launchers
  - launching
  - launching sites
- National Oceanic Satellite System**
- DEF Joint NASA (Goddard)-DOD venture.
  - RT artificial satellites
  - maritime satellites
  - ∞ systems
- National Operational Environmental Sat Sys*
- USE **NOESS**
- national parks**
- DEF Areas of scenic beauty or historical importance preserved and maintained by a national government for the enjoyment of the public.
  - GS land
    - . parks

## National Severe Storms Project

### . . national parks

- . . . Yellowstone National Park (ID-MT-WY)

*National Polar-orbiting Operational Environmental Satellite System*  
(added April 2009)

USE **NPOESS**

### National Severe Storms Project

- RT meteorology
- tornadoes
- warning systems

### nations

#### GS nations

- . Afghanistan
- . Albania
- . Algeria
- . Andorra
- . Angola
- . Antigua and Barbuda
- . Argentina
- . Armenia
- . Australia
- . Austria
- . Azerbaijan
- . Bahamas
- . Bahrain
- . Bangladesh
- . Barbados
- . Belarus
- . Belgium
- . Belize
- . Benin
- . Bhutan
- . Bolivia
- . Botswana
- . Brazil
- . Brunei
- . Bulgaria
- . Burkina
- . Burma
- . Burundi
- . Cambodia
- . Cameroon
- . Canada
  - . . Alberta
  - . . British Columbia
  - . . Manitoba
  - . . New Brunswick
  - . . Newfoundland
  - . . Northwest Territories
  - . . Nova Scotia
  - . . Ontario
  - . . Prince Edward Island
  - . . Quebec
  - . . Saskatchewan
  - . . Yukon Territory
- . Cape Verde
- . Central African Republic
- . Chad
- . Chile
- . China
- . Colombia
- . Congo (Brazzaville)
- . Costa Rica
- . Cote d'Ivoire
- . Croatia
- . Cuba
- . Cyprus
- . Czech Republic
- . Czechoslovakia
- . Denmark
- . Djibouti
- . Dominica
- . Dominican Republic
- . East Germany
- . Ecuador
- . Egypt
- . El Salvador
- . Estonia
- . Ethiopia
- . Finland
- . France
  - . . French Guiana
  - . . Guadeloupe
  - . . Martinique
- . Gabon
- . Gambia

- . Georgia (Eurasia)
- . Germany
- . Ghana
- . Greece
- . Grenada
- . Guatemala
- . Guinea
- . Guyana
- . Haiti
- . Honduras
- . Hungary
- . Iceland
- . India
- . Indonesia
- . Iran
- . Iraq
- . Ireland
- . Israel
- . Italy
- . Jamaica
- . Japan
- . Jordan
- . Kazakhstan
- . Kenya
- . Kuwait
- . Kyrgyzstan
- . Laos
- . Latvia
- . Lebanon
- . Lesotho
- . Liberia
- . Libya
- . Liechtenstein
- . Lithuania
- . Luxembourg
- . Madagascar
- . Malawi
- . Malaysia
- . Maldive Islands
- . Mali
- . Malta
- . Mauritania
- . Mauritius
- . Mexico
- . Moldova
- . Monaco
- . Mongolia
- . Morocco
- . Mozambique
- . Nepal
- . Netherlands
- . New Zealand
- . Nicaragua
- . Niger
- . Nigeria
- . North Korea
- . Norway
- . Oman
- . Pakistan
- . Panama
- . Papua New Guinea
- . Paraguay
- . Peru
- . Philippines
- . Poland
- . Portugal
  - . . Azores
- . Qatar
- . Republic of South Africa
- . Romania
- . Russian Federation
- . Rwanda
- . San Marino
- . Saudi Arabia
- . Senegal
- . Seychelles
- . Sierra Leone
- . Sikkim
- . Singapore
- . Slovakia
- . Somalia
- . South Korea
- . Southern Yemen
- . Spain
  - . . Canary Islands
- . Sri Lanka
- . Sudan
- . Surinam
- . Swaziland

- . Sweden
- . Switzerland
- . Syria
- . Taiwan
- . Tajikistan
- . Tanzania
- . Thailand
- . Tibet
- . Togo
- . Trinidad and Tobago
- . Tunisia
- . Turkey
- . Turkmenistan
- . U.S.S.R.
- . Uganda
- . Ukraine
- . United Arab Emirates
- . United Kingdom
  - . . England
  - . . Gibraltar
  - . . Northern Ireland
  - . . Scotland
  - . . Wales
- . United States
  - . . Alabama
  - . . Alaska
  - . . Arizona
  - . . Arkansas
  - . . California
  - . . Colorado
  - . . Connecticut
  - . . Delaware
  - . . District of Columbia
  - . . Florida
  - . . Georgia
  - . . Guam
  - . . Hawaii
  - . . Idaho
  - . . Illinois
  - . . Indiana
  - . . Iowa
  - . . Kansas
  - . . Kentucky
  - . . Louisiana
  - . . Maine
  - . . Maryland
  - . . Massachusetts
  - . . Michigan
  - . . Minnesota
  - . . Mississippi
  - . . Missouri
  - . . Montana
  - . . Nebraska
  - . . Nevada
  - . . New Hampshire
  - . . New Jersey
  - . . New Mexico
  - . . New York
  - . . North Carolina
  - . . North Dakota
  - . . Ohio
  - . . Oklahoma
  - . . Oregon
  - . . Pennsylvania
  - . . Puerto Rico
  - . . Rhode Island
  - . . South Carolina
  - . . South Dakota
  - . . Tennessee
  - . . Texas
  - . . Utah
  - . . Vermont
  - . . Virgin Islands
  - . . Virginia
  - . . Washington
  - . . West Virginia
  - . . Wisconsin
  - . . Wyoming
  - . . Bosnia and Herzegovina
  - . . Democratic Republic of Congo
  - . . Serbska Republic
  - . . Uruguay
  - . . Uzbekistan
  - . . Vatican City
  - . . Venezuela
  - . . Vietnam
  - . . West Germany
  - . . Yemen
  - . . Yugoslavia

. Zambia  
 . Zimbabwe  
 RT Africa  
 Asia  
 cities  
 Commonwealth of Independent States  
 communities  
 demography  
 developing nations  
 Europe  
 federations  
 Hong Kong  
 international law  
 minorities  
 Namibia  
 politics  
 regimes  
 Spanish Sahara  
 United Nations

**NATO 3B satellite**

GS artificial satellites  
 . communication satellites  
 . . Communications Technology Satellite  
 . . . **NATO 3B satellite**

*natural convection*

USE **free convection**

*natural frequencies*

USE **resonant frequencies**

**natural gas**

DEF (A) Hydrocarbons that exist as a gas or vapor at ordinary pressures and temperatures. Methane is the most important, but ethane, propane, or others may be present. (B) Gaseous hydrocarbons trapped in the zone of ground water saturation under pressure from, and partially dissolved in, underlying water or petroleum.

GS fuels  
 . chemical fuels  
 . . hydrocarbon fuels  
 . . . fossil fuels  
 . . . . **natural gas**  
 . . . . . liquefied natural gas  
 . gaseous fuels  
 . . **natural gas**  
 . . . liquefied natural gas  
 gases  
 . flammable gases  
 . . gaseous fuels  
 . . . **natural gas**  
 . . . . liquefied natural gas  
 geophysical fluids  
 . **natural gas**  
 . . liquefied natural gas  
 organic compounds  
 . hydrocarbons  
 . . **natural gas**  
 . . . liquefied natural gas  
 resources  
 . Earth resources  
 . . fossil fuels  
 . . . **natural gas**  
 . . . . liquefied natural gas  
 RT methane  
 natural gas exploration  
 oil fields  
 petroleum products

**natural gas exploration**

DEF Searching the geological features to identify locations for stimulating wells for recovery of natural gas.

GS exploration  
 . **natural gas exploration**  
 RT drilling  
 methane  
 natural gas  
 oil exploration  
 photogeology

**natural language (computers)**

DEF A computer language whose rules reflect and describe current rather than prescribed

usage. The language is often loose and ambiguous in interpretation.

GS languages  
 . programming languages  
 . . **natural language (computers)**  
 RT computer programming context  
 data processing  
 knowledge representation

**natural language processing**

(added September 1993)  
 RT artificial intelligence  
 expert systems  
 human-computer interface  
 information analysis  
 knowledge based systems  
 linguistics  
 machine translation  
 parsing algorithms  
 semantics  
 syntax

*natural lasers*

USE **lasers**

**natural satellites**

SN (EXCLUDES PLANETS)

UF *Dactyl*  
*moons*  
*planetary satellites*  
 celestial bodies  
 GS **natural satellites**  
 . icy satellites  
 . . Ariel  
 . . . Callisto  
 . . . Dione  
 . . . Enceladus  
 . . . Europa  
 . . . Ganymede  
 . . . Hyperion  
 . . . Iapetus  
 . . . Mimas  
 . . . Rhea (astronomy)  
 . . . Tethys  
 . . . Titania  
 . . Jupiter satellites  
 . . . Adrastea  
 . . . Amalthea  
 . . . Carme  
 . . . Elara  
 . . . Galilean satellites  
 . . . Callisto  
 . . . Europa  
 . . . Ganymede  
 . . . Io  
 . . . Himalia  
 . . . Leda  
 . . . Lysithea  
 . . . Metis  
 . . . Pasiphae  
 . . . Sinope  
 . . . Thebe  
 . . Mars satellites  
 . . . Deimos  
 . . . Phobos  
 . . moon  
 . . Neptune satellites  
 . . . Galatea  
 . . . Larissa  
 . . . Naiad  
 . . . Nereid  
 . . . Proteus  
 . . . Triton  
 . . Pluto satellites  
 . . . Charon  
 . . . Hydra  
 . . . Nix  
 . . Saturn satellites  
 . . . Calypso  
 . . . Dione  
 . . . Enceladus  
 . . . Epimetheus  
 . . . Helene  
 . . . Hyperion  
 . . . Iapetus  
 . . . Janus  
 . . . Mimas  
 . . . Pandora  
 . . . Phoebe

. . . Prometheus  
 . . . Rhea (astronomy)  
 . . . Teleso  
 . . . Tethys  
 . . . Titan  
 . . Uranus satellites  
 . . . Ariel  
 . . . Cordelia  
 . . . Miranda  
 . . . Oberon  
 . . . Puck  
 . . . Titania  
 . . . Umbriel  
 RT artificial satellites  
 Cyrillid meteoroids  
 Earth-Moon system  
 meteoroids  
 moonlets  
 planets  
 Roche limit  
 satellite atmospheres  
 satellite surfaces  
 ∞ satellites  
 Saturn rings  
 solar system  
 tektites  
 Uranus rings

**nausea**

DEF A feeling of discomfort in the region of the stomach, with aversion to food and a tendency to vomit.

GS signs and symptoms

. **nausea**

RT antiemetics and antinauseants  
 motion sickness  
 vomiting

**nautical charts**

DEF Charts and maps of oceans, coasts and harbors now compiled from satellite data for precision and correction of local errors.

GS charts

. **nautical charts**

RT navigation aids  
 navigation satellites  
 surface navigation

**Navaho missile**

GS missiles

. ramjet missiles

. . **Navaho missile**

. surface to surface missiles

. . cruise missiles

. . . **Navaho missile**

RT liquid propellant rocket engines  
 multistage rocket vehicles  
 ramjet engines

**Navier-Stokes equation**

DEF The equation of motion for a viscous fluid.

GS equations of motion

. **Navier-Stokes equation**

flow equations

. **Navier-Stokes equation**

RT Burger equation  
 computational fluid dynamics  
 direct numerical simulation  
 ∞ equations

flow theory

incompressible flow

incompressible fluids

large eddy simulation

Milne-Thomson method

Newtonian fluids

Oseen approximation

Reynolds averaging

Reynolds equation

Reynolds stress

viscous flow

viscous fluids

**navigation**

DEF The practice or art of directing the movement of a craft from one point to another. Navigation usually implies the presence of a human, a navigator, aboard the craft.

GS **navigation**

. air navigation



## navigation aids

- . . all-weather air navigation
- . . area navigation
- . . nap-of-the-earth navigation
- . . . terrain following
- . autonomous navigation
- . celestial navigation
- . . Astroguide Navigation System
- . . astronavigation
- . dead reckoning
- . digital navigation
- . Doppler navigation
- . hybrid navigation systems
- . inertial navigation
  - . . Astroguide Navigation System
  - . . gimballess inertial navigation
  - . . Omega Navigation System
- . polar navigation
- . radar navigation
- . radio navigation
  - . . hyperbolic navigation
  - . . . Decca navigation
  - . . . LORAC navigation system
  - . . . loran
  - . . . . loran C
  - . . . . loran D
  - . . . . Shoran
  - . . Tacan
  - . . VHF omnirange navigation
- . space navigation
  - . . interplanetary navigation
  - . proportional navigation
  - . surface navigation
- RT automatic flight control
- azimuth
- bay ice
- declination
- distance measuring equipment
- ∞ fixing
- flight control
- flight paths
- Global Positioning System
- guidance (motion)
- gyroscopic coupling
- homing devices
- latitude measurement
- locomotion
- longitude measurement
- orbital position estimation
- plotting
- position (location)
- position errors
- positioning
- star trackers
- stationkeeping
- ∞ systems
- triangulation

### navigation aids

- GS **navigation aids**
  - . beacons
    - . . airport beacons
    - . . . discrete address beacon system
    - . . radar beacons
    - . . . discrete address beacon system
    - . . radio beacons
    - . . . omnidirectional radio ranges
    - . . . . self calibrating omnirange
    - . . radio direction finders
    - . Light Airborne Multipurpose System
    - . microwave scanning beam landing system
  - . navigation instruments
    - . . attitude indicators
    - . . . gyro horizons
    - . . compasses
    - . . . gyrocompasses
    - . . . magnetic compasses
    - . . . solar compasses
    - . . radio direction finders
    - . TERCOM

### RT ∞ aids

- air navigation
- air traffic control
- aircraft equipment
- aircraft instruments
- aircraft safety
- airports
- all-weather air navigation
- altimeters

- approach indicators
- automatic flight control
- automatic pilots
- automatic traffic advisory and resolution
- autonomous navigation
- buoys
- charts
- Decca navigation
- display devices
- distance measuring equipment
- echo sounding
- flight control
- flight management systems
- flight paths
- gyrostabilizers
- head-up displays
- heliports
- homing devices
- hybrid navigation systems
- inertial navigation
- Kalman filters
- landing aids
- laser range finders
- LORAC navigation system
- loran
- loran C
- loran D
- maps
- ∞ mars
- military air facilities
- nautical charts
- plotters
- position indicators
- radio navigation
- range finders
- reduced order filters
- reference stars
- sextants
- Shoran
- solar sensors
- sonar
- star trackers
- surface navigation
- Tacan
- VHF omnirange navigation
- weather

### navigation instruments

- GS navigation aids
  - . **navigation instruments**
    - . . attitude indicators
    - . . . gyro horizons
    - . . compasses
    - . . . gyrocompasses
    - . . . magnetic compasses
    - . . . solar compasses
    - . . radio direction finders
- RT aircraft equipment
  - aircraft instruments
  - altimeters
  - autonomous navigation
  - boresight error
  - flight control
  - flight instruments
  - gimballess inertial navigation
  - horizon scanners
  - hybrid navigation systems
  - inertial platforms
  - ∞ instruments
    - Kalman-Schmidt filtering
    - laser range finders
    - Light Airborne Multipurpose System
    - LORAC navigation system
    - loran
    - measuring instruments
    - position indicators
    - radar
    - solar sensors
    - star trackers
    - TERCOM

### navigation satellites

- GS artificial satellites
  - . **navigation satellites**
    - . . Aerosat satellites
    - . . Explorer 22 satellite
    - . . navigation technology satellites
    - . . NAVSTAR satellites

- . . Nova satellites
- . . Refsat
- . . Transit Attitude Control satellite
- . . Transit satellites
- RT active satellites
  - ATS
  - geodetic satellites
  - LOCATES system
  - meteorological satellites
  - military spacecraft
  - nautical charts
  - passive satellites
  - satellite navigation systems
  - satellite networks
  - synchronous satellites
  - Transit navigation system

### navigation technology satellites

- DEF Class of navigation satellites utilizing the global positioning system as well as a precise frequency and timing system. Used for NTS.
- UF *NTS*
- GS artificial satellites
  - . navigation satellites
  - . . **navigation technology satellites**
- RT NAVSTAR satellites

### navigators

- GS personnel
  - . **navigators**
- RT flight crews
  - flying personnel

### Navion aircraft

- GS **Navion aircraft**
  - . G-1 aircraft
- RT ∞ aircraft

### Navion G-1 aircraft

- USE **G-1 aircraft**

### Navion Rangemaster aircraft

- USE **G-1 aircraft**

### NAVSTAR satellites

- GS artificial satellites
  - . navigation satellites
  - . . **NAVSTAR satellites**
- RT active satellites
  - ATS
  - geodetic satellites
  - INMARSAT satellites
  - navigation technology satellites
  - Refsat
  - satellite networks

### navy

- GS armed forces
  - . **navy**
- RT aircraft carriers
  - ballistic missile submarines
  - Fleet Satellite Communication System
  - nuclear powered ships
  - ships
  - submarines
  - trident submarine
- ∞ vessels

### N-body problem

- USE **many body problem**

### NC-130 aircraft

- USE **C-130 aircraft**

### NDM semiconductor devices

- SN (NEGATIVE DIFFERENTIAL MOBILITY SEMICONDUCTOR DEVICES)
- UF *negative diff mobility semiconductors*
- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . **NDM semiconductor devices**
- RT conduction bands
  - ∞ devices
  - diffusivity
  - electron mobility

- ionic mobility
- NDVI (*remote sensing*)  
(added June 2001)
- USE **normalized difference vegetation index**
- Near Earth Asteroid Rendezvous Mission**  
(added March 1996)
- GS space missions  
. asteroid missions  
. . **Near Earth Asteroid Rendezvous Mission**  
. flyby missions  
. . **Near Earth Asteroid Rendezvous Mission**
- RT Comet Rendezvous Asteroid Flyby Mission  
Earth orbits  
EROS asteroid  
near Earth objects  
rendezvous trajectories  
Rosetta mission
- near Earth objects**  
(added November 2001)
- DEF Asteroids, meteoroids, or short-period comets having trajectories that intersect the orbit of Earth or that are within 0.3 Astronomical Units (AU) of Earth. Asteroids and comets with perihelion distance less than 1.3 AU.
- UF *NEO (astronomy)*
- GS celestial bodies  
. **near Earth objects**
- RT asteroid collisions  
asteroids  
cometary collisions  
comets  
Earth orbital environments  
meteorite collisions  
meteorites  
Near Earth Asteroid Rendezvous Mission  
space debris
- near fields**
- GS electromagnetic fields  
. **near fields**
- RT antenna radiation patterns  
antennas  
electromagnetic radiation  
far fields  
laser arrays  
radio equipment  
sidelobes
- near infrared radiation**
- SN (0.75 TO 3 MICRONS)
- GS electromagnetic radiation  
. infrared radiation  
. . **near infrared radiation**
- RT far infrared radiation  
infrared photometry  
light (visible radiation)
- ∞ radiation  
radiative heat transfer  
radiative transfer  
terrestrial radiation  
thermal radiation
- near ultraviolet radiation**
- SN (2000 TO 4000 ANGSTROMS)
- GS electromagnetic radiation  
. ultraviolet radiation  
. . **near ultraviolet radiation**
- RT far ultraviolet radiation  
light (visible radiation)
- ∞ radiation
- near wakes**
- GS wakes  
. **near wakes**
- nearshore water**
- GS water  
. **nearshore water**  
. . coastal water
- RT marine environments  
oceans  
sea water
- vadose water  
water depth  
wetlands
- Nebraska**
- GS nations  
. United States  
. . **Nebraska**
- RT Missouri River (US)  
Sand Hills Region (NE)
- nebulae**
- DEF Clouds of interstellar gas and dust, seen either as a luminous patch of light or a dark cloud against a bright background. The term nebula was coined to describe objects that appeared fuzzy when viewed through early telescopes.
- GS celestial bodies  
. **nebulae**  
. . Cassiopeia A  
. . Crab nebula  
. . Gum nebula  
. . H I regions  
. . H II regions  
. . Herbig-Haro objects  
. . Orion nebula  
. . planetary nebulae  
. . reflection nebulae  
. . solar nebula
- RT galaxies  
interstellar matter  
irregular galaxies  
Maffei galaxies  
Magellanic clouds  
North Polar Spur (astronomy)  
Ophiuchi clouds  
Opik theory  
solar corona  
star formation  
supernovae
- neck (anatomy)**
- GS anatomy  
. **neck (anatomy)**
- RT vertebrae
- necrosis**  
(added October 2000)
- DEF One of the two mechanisms by which cell death occurs (the other being the physiological process of APOPTOSIS). A pathological process caused by the progressive degradative action of enzymes that is generally associated with severe cellular trauma. It is characterized by mitochondrial swelling, nuclear flocculation, uncontrolled cell lysis, and ultimately cell death. In general, cell or tissue death caused by disease or injury.
- UF *pathological cell death*
- GS pathological effects  
. **necrosis**
- RT apoptosis  
cells (biology)  
cytology  
death  
diseases  
hypoxia  
injuries  
myocardial infarction  
pathology  
tissues (biology)
- needle bearings**
- GS bearings  
. antifriction bearings  
. . roller bearings  
. . . **needle bearings**
- RT ball bearings
- needles**
- RT dendritic crystals  
sewing  
single crystals  
surgical instruments
- needs (data system)**
- UF *NASA End-to-End Data System*
- GS data systems  
. **needs (data system)**
- end-to-end data systems  
. **needs (data system)**
- RT data acquisition  
data processing  
satellite instruments  
∞ systems  
VSAT (network)
- neel temperature**
- GS temperature  
. **neel temperature**
- RT antiferromagnetism  
magnetic permeability  
phase transformations  
specific heat  
thermal expansion
- negative conductance**
- RT avalanche diodes  
gallium arsenides  
Gunn effect  
tunnel diodes
- negative diff mobility semiconductors*
- USE **NDM semiconductor devices**
- negative electron affinity**
- GS affinity  
. **negative electron affinity**
- RT electron affinity  
electron emission  
gallium arsenides  
photoelectric emission  
semiconductors (materials)
- negative feedback**
- DEF Feedback which results in decreasing the amplification. Used for degenerative feedback.
- UF *degenerative feedback*
- GS feedback  
. **negative feedback**
- RT automatic control  
damping  
degeneration  
feedback control  
nonlinear feedback  
oscillators  
transfer functions
- negative ions**
- DEF Ions singly or in groups which acquire negative charges by gaining one or more electrons.
- GS ions  
. **negative ions**  
. . anions
- RT free radicals  
ionic mobility  
nitrogen ions  
oxygen ions  
plasma physics
- negative matter**  
(added August 1991)
- SN (NOT ANTIMATTER)
- DEF A hypothetical form of matter whose active-gravitational, passive-gravitational, inertial, and rest mass are opposite in sign to normal, positive matter. Negative matter is not antimatter.
- GS matter (physics)  
. **negative matter**
- RT antimatter  
condensed matter physics  
extraterrestrial matter  
mass
- negative matter propulsion**  
(added August 1991)
- GS propulsion  
. spacecraft propulsion  
. . **negative matter propulsion**
- RT interplanetary flight  
interstellar travel  
matter-antimatter propulsion  
rocket engines
- negative resistance circuits**
- GS circuits

## negative resistance devices

### . negative resistance circuits

- RT ∞ resistance
- resonant tunneling diodes
- tunnel diodes

### negative resistance devices

- GS **negative resistance devices**
- . resonant tunneling diodes
- RT aluminum gallium arsenides
- gallium arsenides
- Gunn diodes
- Gunn effect
- MIM diodes
- negatrons
- parametric amplifiers
- Ramsauer effect
- ∞ resistance
- resonant tunneling

### negatrons

- DEF Negative electrons. Sometimes shortened to negatons.
- GS particles
- . charged particles
- . . . energetic particles
- . . . electrons
- . . . . **negatrons**
- . corpuscular radiation
- . . . energetic particles
- . . . electrons
- . . . . **negatrons**
- . elementary particles
- . . . fermions
- . . . leptons
- . . . . electrons
- . . . . . **negatrons**
- RT negative resistance devices

### Nembutal (trademark)

- GS drugs
- . **Nembutal (trademark)**
- ketones
- . **Nembutal (trademark)**
- sodium compounds
- . **Nembutal (trademark)**
- RT pentobarbital sodium

### Nemesis (star)

- UF *solar companion star*
- GS celestial bodies
- . stars
- . . . double stars
- . . . binary stars
- . . . . companion stars
- . . . . . **Nemesis (star)**
- RT dwarf stars
- extinction
- Oort cloud
- solar neighborhood
- stellar orbits
- stellar systems

### NEO (astronomy)

- (added November 2001)
- USE **near Earth objects**

### neodymium

- GS chemical elements
- . rare earth elements
- . . . **neodymium**
- metals
- . rare earth elements
- . . . **neodymium**
- RT didymium

### neodymium alloys

- GS alloys
- . rare earth alloys
- . . . **neodymium alloys**

### neodymium compounds

- GS rare earth compounds
- . **neodymium compounds**
- RT ∞ chemical compounds
- ∞ metal compounds

### neodymium isotopes

- GS chemical elements
- . nuclides
- . . . isotopes

### . . . neodymium isotopes

- . rare earth elements
- . . . **neodymium isotopes**
- metals
- . rare earth elements
- . . . **neodymium isotopes**

### neodymium lasers

- GS stimulated emission devices
- . lasers
- . . . **neodymium lasers**
- RT coherent light
- glass lasers
- optical pumping
- rare earth elements

### neon

- GS chemical elements
- . rare gases
- . . . **neon**
- . . . liquid neon
- . . . neon isotopes
- gases
- . rare gases
- . . . **neon**
- . . . liquid neon
- . . . neon isotopes

### neon 19

- USE **neon isotopes**

### neon isotopes

- UF *neon 19*
- GS chemical elements
- . nuclides
- . . . isotopes
- . . . . **neon isotopes**
- . rare gases
- . . . neon
- . . . . **neon isotopes**
- gases
- . rare gases
- . . . neon
- . . . . **neon isotopes**

### neopentane

- GS organic compounds
- . hydrocarbons
- . . . aliphatic hydrocarbons
- . . . . alkanes
- . . . . . pentanes
- . . . . . . **neopentane**

### neoplasms

- GS diseases
- . tumors
- . . . **neoplasms**
- . . . cancer
- . . . . leukemias
- RT carcinogens
- cysts
- metastasis
- tumor suppressor genes
- tumor suppressor proteins

### neoprenes

- USE **chloroprene resins**

### neotectonics

- (added May 2002)
- DEF Study of the most recent crustal movements and structures of the Earth or other terrestrial planets.
- GS geology
- . tectonics
- . . . **neotectonics**
- RT Earth movements
- plates (tectonics)
- sea floor spreading
- structural properties (geology)
- subduction (geology)

### neovascularization

- (added June 2004)
- USE **angiogenesis**

### Nepal

- GS nations
- . **Nepal**

### RT Asia

### nephelanalysis

- DEF A type of analysis using satellite cloud pictures to study the relationship between cloud formation and storm systems.
- RT Alpine meteorology
- anvil clouds
- Atmospheric Cloud Physics Lab (SpaceLab)
- cap clouds
- chemical analysis
- cirrocumulus clouds
- cirrostratus clouds
- cloud cover
- cloud physics
- clouds (meteorology)
- convection clouds
- meteorological instruments
- meteorology
- nephelometers
- precipitation (meteorology)
- synoptic measurement
- synoptic meteorology
- weather forecasting

### nepheline

- GS aluminum compounds
- . **nepheline**
- minerals
- . **nepheline**
- potassium compounds
- . **nepheline**
- silicon compounds
- . silicates
- . . . **nepheline**
- sodium compounds
- . **nepheline**
- RT nephelite

### nephelite

- GS aluminum compounds
- . **nephelite**
- chalcogenides
- . oxides
- . . . silicon oxides
- . . . . **nephelite**
- minerals
- . **nephelite**
- silicon compounds
- . silicon oxides
- . . . **nephelite**
- RT nepheline

### nephelometers

- DEF General name for instruments which measure, at more than one angle, the scattering function of particles suspended in a medium. Instruments for chemical analysis by measuring the light scattering properties of a suspension.
- GS measuring instruments
- . optical measuring instruments
- . . . **nephelometers**
- optical equipment
- . optical measuring instruments
- . . . **nephelometers**
- RT nephelanalysis
- optical measurement
- photometers

### nephritis

- GS diseases
- . kidney diseases
- . . . **nephritis**
- RT bacterial diseases

### Neptune (planet)

- GS celestial bodies
- . planets
- . . . gas giant planets
- . . . . **Neptune (planet)**
- RT Galatea
- Larissa
- Naiad
- Neptune atmosphere
- Neptune satellites
- Nereid
- Proteus
- Triton

Voyager 2 spacecraft

### Neptune atmosphere

DEF The atmosphere of the planet Neptune which is primarily composed of hydrogen and methane.

- GS environments
  - . extraterrestrial environments
  - . . . planetary environments
  - . . . . planetary atmospheres
  - . . . . . **Neptune atmosphere**
- RT aerospace environments
  - ∞ atmospheres
    - gas giant planets
    - hydrogen
    - methane
    - Neptune (planet)
    - planetary ionospheres
    - Triton

### Neptune satellites

(added August 1989)

- GS celestial bodies
  - . natural satellites
  - . . . **Neptune satellites**
  - . . . . Galatea
  - . . . . Larissa
  - . . . . Naiad
  - . . . . Nereid
  - . . . . Proteus
  - . . . . Triton
- RT Neptune (planet)

### neptunium

- GS chemical elements
  - . actinide series
  - . . . transuranium elements
  - . . . . **neptunium**
  - . . . . . neptunium isotopes
  - . nuclides
  - . . isotopes
  - . . . radioactive isotopes
  - . . . . transuranium elements
  - . . . . . **neptunium**
  - . . . . . . neptunium isotopes
- metals
  - . actinide series
  - . . transuranium elements
  - . . . **neptunium**
  - . . . . neptunium isotopes

### neptunium compounds

- GS actinide series compounds
  - . **neptunium compounds**
- RT ∞ chemical compounds
  - ∞ metal compounds

### neptunium isotopes

- GS chemical elements
  - . actinide series
  - . . transuranium elements
  - . . . neptunium
  - . . . . **neptunium isotopes**
  - . nuclides
  - . . isotopes
  - . . . radioactive isotopes
  - . . . . transuranium elements
  - . . . . . neptunium
  - . . . . . . **neptunium isotopes**
- metals
  - . actinide series
  - . . transuranium elements
  - . . . neptunium
  - . . . . **neptunium isotopes**

### Nereid

(added August 1989)

- GS celestial bodies
  - . natural satellites
  - . . Neptune satellites
  - . . . **Nereid**
- RT Neptune (planet)

### Nernst generators

USE **thermomagnetic cooling**

### Nernst heat theorem

USE **Nernst-Ettingshausen effect**

### Nernst-Ettingshausen effect

UF *Nernst heat theorem*

- GS galvanomagnetic effects
  - . **Nernst-Ettingshausen effect**
- RT ∞ effects
  - temperature effects
  - thermomagnetic effects

### NERVA (engine)

USE **nuclear engine for rocket vehicles**

### nerve fibers

(added August 2004)

DEF Slender processes of neurons, including the axons and their glial envelopes ( myelin sheath). Nerve fibers conduct nerve impulses to and from the central nervous system.

- GS anatomy
  - . nervous system
  - . . nerves
  - . . . **nerve fibers**
- RT axons
  - electrophysiology
  - myelin sheath
  - neurons

### nerves

- GS anatomy
  - . nervous system
  - . . **nerves**
  - . . . ganglia
  - . . . myelin sheath
  - . . . nerve fibers
  - . . . oculomotor nerves
- RT carotid sinus body
  - carotid sinus reflex
  - dendrites
  - His bundle
  - myelin
  - neuritis
  - neurons
  - sciatic region
  - synapses

### nervous system

- UF *vasomotor nervous system*
- GS anatomy
  - . **nervous system**
  - . . afferent nervous systems
  - . . autonomic nervous system
  - . . . sympathetic nervous system
  - . . central nervous system
  - . . . brain
  - . . . . brain stem
  - . . . . cerebellum
  - . . . . cerebral ventricles
  - . . . . cerebrum
  - . . . . . cerebral cortex
  - . . . . . occipital lobes
  - . . . . . diencephalon
  - . . . . . hypothalamus
  - . . . . . pineal gland
  - . . . . . thalamus
  - . . . . hippocampus
  - . . . . spinal cord
  - . . efferent nervous systems
  - . . nerves
  - . . . ganglia
  - . . . myelin sheath
  - . . . nerve fibers
  - . . . oculomotor nerves
  - . . peripheral nervous system
- RT dendrites
  - electrophysiology
  - homeostasis
  - myelin
  - neurasthenia
  - neuritis
  - neuroglia
  - neurons
  - neuropsychiatry
  - neurotransmitters
  - proprioceptors
  - psychopharmacology
  - sense organs
  - synapses
- ∞ systems

### Netherlands

- UF *Holland*
- GS nations
  - . **Netherlands**

- RT Astronomical Netherlands Satellite
  - Europe
  - Netherlands space program
  - Surinam

### Netherlands space program

(added March 1989)

- GS programs
  - . space programs
  - . . European space programs
  - . . . **Netherlands space program**
- RT Astronomical Netherlands Satellite
  - Infrared Astronomy Satellite
  - Netherlands

### ∞ nets

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED -- CONSULT THE TERMS LISTED BELOW)
- RT coordinates
  - distribution functions
  - geodetic coordinates
  - graph theory
  - Kirchhoff law of networks
  - netting (materials/structures)
  - networks
  - Petri nets
  - structured grids (mathematics)
  - superposition (mathematics)
  - topology
  - trees (mathematics)

### netting (materials/structures)

(added July 1995)

- RT camouflage
  - coverings
  - crosslinking
  - crystal growth
  - fibers
  - filament winding
  - laminates
  - molecular chains
- ∞ nets
  - parachute fabrics
  - webs (sheets)

### network analysis

- UF *Tellegen theory*
- GS **network analysis**
  - . critical path method
  - . sneak circuit analysis
- RT ∞ analyzing
  - circuits
  - data flow analysis
  - distributed parameter systems
  - duality principle
  - electric terminals
  - equivalent circuits
  - Foster theory
  - gyrators
  - hydraulic equipment
  - insertion
  - Kirchhoff law of networks
  - LC circuits
- ∞ paths
  - RC circuits
  - RL circuits
  - RLC circuits
  - signal flow graphs
  - superposition (mathematics)

### network control

- DEF The management of acquisition, routing, and switching primarily in satellite communication.
- RT communication networks
  - communication satellites
  - computer networks
- ∞ control
  - local area networks
  - packet switching
  - satellite networks
  - transmission efficiency

### network synthesis

- UF *Tellegen theory*
- RT communication theory
  - equivalent circuits
  - hydraulic equipment
  - Kirchhoff law of networks
  - LC circuits

## networks

networks  
 RC circuits  
 Richards theorem  
 RL circuits  
 RLC circuits  
 superposition (mathematics)  
 switching theory  
 ∞ synthesis  
 topology

### networks

GS **networks**  
 . belief networks  
 . communication networks  
 . . Aloha system  
 . . Deep Space Network  
 . . internets  
 . . . ARPA computer network  
 . . . World Wide Web  
 . . Iridium network  
 . . local area networks  
 . . NASCOM network  
 . . VSAT (network)  
 . . wide area networks  
 . computer networks  
 . . internets  
 . . . ARPA computer network  
 . . . World Wide Web  
 . . client server systems  
 . . local area networks  
 . . wide area networks  
 . defense communications system (DCS)  
 . electric networks  
 . iterative networks  
 . neural nets  
 . Orion (radio interferometry network)  
 . Petri nets  
 . quadrupole networks  
 . satellite networks  
 . . Argos system  
 . . satellite constellations  
 . . . Constellation-X  
 . . . Iridium network  
 . . VSAT (network)  
 . tracking networks  
 . . Deep Space Network  
 . . Global Tracking Network  
 . . manned space flight network  
 . . MATTS (systems)  
 . . polystation doppler tracking system  
 . . radar networks  
 . . space detection and tracking system  
 . . Space Flight Tracking and Data Network  
 . . STDN (network)  
 RT data links  
 educational television  
 gravimetry  
 ground stations  
 information systems  
 ∞ nets  
 network synthesis  
 protocol (computers)  
 telecommunication

### Neumann problem

GS analysis (mathematics)  
 . real variables  
 . . **Neumann problem**  
 boundary value problems  
 . **Neumann problem**  
 RT differential equations  
 partial differential equations  
 ∞ problems

### neural nets

GS networks  
 . **neural nets**  
 RT associative memory  
 backpropagation (artificial intelligence)  
 belief networks  
 cybernetics  
 evolvable hardware  
 Gabor filters  
 genetic algorithms  
 logic circuits

membership functions

### neurasthenia

GS diseases  
 . **neurasthenia**  
 RT nervous system

### neuristors

GS electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . **neuristors**  
 RT bionics

### neuritis

GS diseases  
 . **neuritis**  
 RT nerves  
 nervous system

### neuroblasts

GS cells (biology)  
 . neurons  
 . . **neuroblasts**  
 RT embryology

### neuroglia

GS tissues (biology)  
 . **neuroglia**  
 RT brain  
 cells (biology)  
 ganglia  
 nervous system  
 spinal cord

### neurology

DEF The study of the anatomy, physiology, and pathology of the nervous system. Used for neuroscience.  
 UF *neuroscience*  
 GS medical science  
 . **neurology**  
 RT brain  
 chemical defense  
 electrophysiology  
 life sciences  
 neuropsychiatry  
 thresholds (perception)

### neuromuscular transmission

RT acetylcholine  
 bioelectricity  
 cholinesterase  
 neurotransmitters  
 peripheral nervous system  
 synapses

### neuron transmission

USE **bioelectricity**

### neurons

GS cells (biology)  
 . **neurons**  
 . . axons  
 . . dendrites  
 . . neuroblasts  
 RT blood-brain barrier  
 myelin  
 nerve fibers  
 nerves  
 nervous system  
 synapses  
 syncoders

### neurophysiology

GS physiology  
 . **neurophysiology**  
 RT dopamine  
 ganglia  
 information processing (biology)  
 ion channels (biology)  
 ontogeny  
 psychotropic drugs  
 ∞ science

### neuropsychiatry

GS medical science  
 . psychiatry  
 . . **neuropsychiatry**  
 RT human behavior  
 ∞ medicine

mental health  
 nervous system  
 neurology  
 psychotherapy

### neuroscience

USE **neurology**

### neuroses

GS **neuroses**  
 . neurotic depression  
 RT fear  
 fear of flying  
 psychoses

### neurospora

GS plants (botany)  
 . fungi  
 . . **neurospora**  
 RT genetics

### neurotic depression

GS neuroses  
 . **neurotic depression**  
 RT ∞ depression  
 psychotic depression

### neurotransmitters

DEF Chemical substances secreted by the terminal ends of axons, which stimulate a muscle fiber contraction or an impulse in other neurons.

GS **neurotransmitters**  
 . acetylcholine  
 . vasopressins  
 RT angiotensins  
 axons  
 catecholamine  
 cells (biology)  
 dopamine  
 epinephrine  
 nervous system  
 neuromuscular transmission  
 norepinephrine  
 synapses

### neurotropism

GS tropism  
 . **neurotropism**

### neutral atmospheres

RT ∞ atmospheres  
 neutral gases

### neutral atoms

DEF Atoms in which the number of electrons surrounding the nucleus equals the number of protons in the nucleus resulting in no net electric charge.

GS atoms  
 . **neutral atoms**  
 RT atomic beams  
 charge distribution  
 ∞ elements  
 H I regions  
 neutral beams  
 neutral gases

### neutral beams

GS beams (radiation)  
 . particle beams  
 . . **neutral beams**  
 . . . molecular beams  
 . . . neutron beams  
 RT atomic beams  
 beam injection  
 beam neutralization  
 neutral atoms  
 particles  
 pion beams

### neutral buoyancy simulation

GS environmental tests  
 . underwater tests  
 . . **neutral buoyancy simulation**  
 simulation  
 . environment simulation  
 . . space environment simulation  
 . . . weightlessness simulation  
 . . . **neutral buoyancy simulation**

- RT buoyancy  
space simulators  
weightlessness
- neutral currents**  
DEF Weak interaction currents that carry zero electric charge.  
RT current distribution  
gravitational collapse  
neutral particles  
neutrinos  
neutron stars  
particle interactions  
stellar evolution
- neutral gases**  
DEF In astronomy, gas clouds of some nebulae which have not been ionized by hot stars.  
GS gases  
. **neutral gases**  
RT cosmic gases  
H I regions  
hydrogen clouds  
interplanetary gas  
interstellar gas  
ionized gases  
neutral atmospheres  
neutral atoms  
plasmas (physics)
- neutral particles**  
GS particles  
. **neutral particles**  
. . gravitinos  
. . neutrons  
. . . cold neutrons  
. . . fast neutrons  
. . . photoneutrons  
. . . solar neutrons  
. . . thermal neutrons  
RT electron recombination  
neutral currents
- neutral sheets**  
RT atmospheric physics  
charged particles  
Earth magnetosphere  
particle motion  
plasma physics  
∞ sheets
- neutralizers**  
RT additives  
∞ agents  
buffers (chemistry)  
dischargers  
inhibitors  
preservatives  
retardants  
stabilizers (agents)  
suppressors
- neutrino beams**  
DEF Organized collections of neutrinos traveling outward from the source.  
GS beams (radiation)  
. particle beams  
. . **neutrino beams**
- neutrinos**  
DEF Subatomic particles of zero, or near zero, rest mass, having no electric charge, postulated by Fermi (1934) in order to explain apparent contradictions to the law of conservation of energy in beta particle emission.  
GS particles  
. elementary particles  
. . fermions  
. . . leptons  
. . . . **neutrinos**  
. . . . solar neutrinos  
RT antineutrinos  
dark matter  
gravitinos  
neutral currents
- neutron absorbers**  
GS absorbers (materials)  
. **neutron absorbers**
- RT control rods  
moderators  
poisoning (reaction inhibition)  
radiation absorption  
radiation shielding
- neutron activation analysis**  
GS activation analysis  
. **neutron activation analysis**  
chemical tests  
. chemical analysis  
. . **neutron activation analysis**  
RT mass spectrometers  
microanalysis  
qualitative analysis  
quantitative analysis  
spectroscopic analysis
- neutron beams**  
GS beams (radiation)  
. particle beams  
. . neutron beams  
. . . **neutron beams**  
nuclear radiation  
. **neutron beams**  
RT atomic beams  
particles  
pion beams  
proton beams
- neutron counters**  
UF *neutron detectors*  
GS measuring instruments  
. counters  
. . radiation counters  
. . . **neutron counters**  
. . . . neutron spectrometers  
. radiation measuring instruments  
. . radiation counters  
. . . **neutron counters**  
. . . . neutron spectrometers  
RT dosimeters  
Geiger counters  
ionization chambers  
proportional counters  
scintillation counters  
spark chambers
- neutron cross sections**  
RT absorption cross sections  
∞ cross sections  
nuclear particles  
scattering cross sections  
stopping power
- neutron decay**  
GS decay  
. particle decay  
. . **neutron decay**  
RT hot atoms
- neutron detectors*  
USE **neutron counters**
- neutron diffraction**  
GS diffraction  
. **neutron diffraction**  
RT crystallography
- neutron distribution**  
GS distribution (property)  
. **neutron distribution**  
RT nuclear particles
- neutron emission**  
GS decay  
. radioactive decay  
. . **neutron emission**  
emission  
. particle emission  
. . **neutron emission**  
nuclear reactions  
. radioactive decay  
. . **neutron emission**  
RT neutrons
- selection rules (nuclear physics)
- neutron flux*  
USE **flux (rate)**
- neutron flux density**  
SN (LIMITED TO NEUTRON EMISSION OR DETECTION RATE PER UNIT AREA)  
DEF A measure of the intensity of neutron radiation within a given range of neutron energies; the product of the neutron density and velocity, measured in neutrons per square meter-second or neutrons per square centimeter-second.  
GS rates (per time)  
. flux density  
. . radiant flux density  
. . . particle flux density  
. . . . **neutron flux density**  
RT high flux isotope reactors  
irradiance  
nuclear fission  
radiance  
radiancy  
radiation shielding  
solar neutrons
- neutron irradiation**  
GS irradiation  
. **neutron irradiation**  
RT ion irradiation  
neutron transmutation doping  
transmutation
- neutron physics**  
RT ∞ physics  
∞ science
- neutron radiography**  
DEF Nondestructive testing and inspection utilizing neutron beams from nuclear reactors, particle accelerators, and/or radioisotopes. Imagery displaying structural defects utilizes neutron image recorders or screens.  
GS imagery  
. radiography  
. . **neutron radiography**  
nondestructive tests  
. **neutron radiography**  
RT ∞ materials tests
- neutron scattering**  
UF *Legendre code*  
GS nuclear reactions  
. nuclear scattering  
. . **neutron scattering**  
scattering  
. nuclear scattering  
. . **neutron scattering**  
RT elementary particles  
nuclear particles  
resonance scattering
- neutron sources**  
GS radiation sources  
. **neutron sources**  
RT linear accelerators  
nuclear fuels  
nuclear research and test reactors  
particle accelerators  
spent fuels
- neutron spectra**  
GS spectra  
. energy spectra  
. . **neutron spectra**
- neutron spectrometers**  
UF *triple axis spectrometers*  
GS measuring instruments  
. counters  
. . radiation counters  
. . . neutron counters  
. . . . **neutron spectrometers**  
. radiation measuring instruments  
. . radiation counters  
. . . neutron counters  
. . . . **neutron spectrometers**  
. spectrometers

## neutron stars

- . . **neutron spectrometers**
- neutron stars**
  - GS (EXCLUDES TRACKS OF PARTICLES EMANATING FROM A NUCLEAR COLLISION)
  - GS celestial bodies
    - . stars
    - . . **neutron stars**
    - . . . magnetars
    - . . . pulsars
    - . . . soft gamma repeaters
  - RT degenerate matter
  - gravitational binding energy
  - gravitational lenses
  - neutral currents
  - starquakes
  - supernova remnants
  - x ray binaries
  - x ray stars
- neutron thermalization**
  - GS energy absorption
    - . moderation (energy absorption)
    - . . thermalization (energy absorption)
    - . . . **neutron thermalization**
- neutron transmutation*
  - USE **nuclear reactions**
- neutron transmutation doping**
  - (added June 2003)
  - DEF A doping technique for creating impurity isotopes from the host atoms of a material through the use of thermal neutron irradiation and subsequent radioactive decay
  - GS doping (materials)
    - . **neutron transmutation doping**
  - RT additives
    - doped crystals
    - neutron irradiation
    - transmutation
- neutrons**
  - DEF Subatomic particles with no electric charge, and with a mass of 1. 67482 times 10 to the minus 24 gram.
  - GS particles
    - . elementary particles
    - . . fermions
    - . . . **neutrons**
    - . . . . cold neutrons
    - . . . . fast neutrons
    - . . . . photoneutrons
    - . . . . solar neutrons
    - . . . . thermal neutrons
    - . neutral particles
    - . . **neutrons**
    - . . . cold neutrons
    - . . . fast neutrons
    - . . . photoneutrons
    - . . . solar neutrons
    - . . . thermal neutrons
  - RT baryons
  - chain reactions (nuclear physics)
  - charged particles
  - corpussular radiation
  - cosmic rays
  - neutron emission
  - nuclear radiation
  - nuclei (nuclear physics)
  - nucleon potential
  - nucleons
  - radiation effects
  - radiation shielding
- neutrophils**
  - (added August 2004)
  - DEF Granular leukocytes having a nucleus with three to five lobes connected by slender threads of chromatin, and cytoplasm containing fine inconspicuous granules and stainable by neutral dyes.
  - GS cells (biology)
    - . blood cells
    - . . leukocytes
    - . . . **neutrophils**
  - RT chromatin
  - cytoplasm
- immune systems
- Nevada**
  - GS nations
    - . United States
    - . . **Nevada**
  - RT Great Basin (US)
  - Lake Tahoe (CA-NV)
  - Pyramid Lake (NV)
  - Southern California
- New Brunswick**
  - GS nations
    - . Canada
    - . . **New Brunswick**
- New England (US)**
  - GS regions
    - . **New England (US)**
  - RT United States
- New Guinea (island)**
  - GS landforms
    - . islands
    - . . Pacific islands
    - . . . **New Guinea (island)**
  - RT Papua New Guinea
  - Torres Strait
- New Hampshire**
  - GS nations
    - . United States
    - . . **New Hampshire**
  - RT St Lawrence Valley (North America)
- New Haven (CT)**
  - GS cities
    - . **New Haven (CT)**
  - RT Connecticut
- New Horizons mission**
  - (added January 2006)
  - DEF Flyby mission to study the composition, geology, and morphology of Pluto and its moon Charon; search for rings and additional satellites around Pluto; and to conduct similar investigations of one or more Kuiper Belt Objects.
  - GS programs
    - . NASA programs
    - . . NASA space programs
    - . . . **New Horizons mission**
    - . . space programs
    - . . . NASA space programs
    - . . . **New Horizons mission**
    - space missions
    - . flyby missions
    - . . **New Horizons mission**
  - RT asteroid missions
  - Charon
  - Kuiper belt
  - Pluto (planet)
  - space exploration
- New Jersey**
  - GS nations
    - . United States
    - . . **New Jersey**
  - RT Delaware Bay (US)
  - Delaware River Basin (US)
  - Hudson River (NY-NJ)
- New Mexico**
  - GS nations
    - . United States
    - . . **New Mexico**
  - RT Colorado Plateau (US)
  - Rio Grande (North America)
- NEW MOONS project**
  - GS programs
    - . NASA programs
    - . . NASA space programs
    - . . . **NEW MOONS project**
    - . projects
    - . . **NEW MOONS project**
    - . . space programs
    - . . . NASA space programs
    - . . . **NEW MOONS project**
  - RT nuclear propulsion
- structural weight
- weight analysis
- New York**
  - GS nations
    - . United States
    - . . **New York**
  - RT Adirondack Mountains (NY)
  - Delaware River Basin (US)
  - Hudson River (NY-NJ)
  - Lake Champlain Basin (NY-VT)
  - Long Island (NY)
  - New York City (NY)
  - St Lawrence Valley (North America)
  - Susquehanna River Basin (MD-NY-PA)
- New York City (NY)**
  - GS cities
    - . **New York City (NY)**
  - RT New York
- New Zealand**
  - GS landforms
    - . islands
    - . . Pacific islands
    - . . . **New Zealand**
  - nations
    - . **New Zealand**
  - RT New Zealand space program
- New Zealand space program**
  - (added June 1989)
  - GS programs
    - . space programs
    - . . **New Zealand space program**
  - RT New Zealand
- Newfoundland**
  - GS landforms
    - . islands
    - . . **Newfoundland**
  - nations
    - . Canada
    - . . **Newfoundland**
- news**
  - RT documentation
- news media**
  - RT data acquisition
  - information
  - Internet resources
  - ∞ journals
- newton**
  - DEF The unit of force in the SI system; that force which gives to a mass of 1 kilogram an acceleration of 1 meter per second squared.
  - RT ∞ force
  - kinetics
  - Newtonian fluids
  - nonNewtonian fluids
- Newton methods**
  - GS analysis (mathematics)
    - . numerical analysis
    - . . approximation
    - . . . **Newton methods**
    - . . . . Newton-Raphson method
    - . . . iteration
    - . . . **Newton methods**
    - . . . . Newton-Raphson method
  - RT iterative solution
  - problem solving
  - roots of equations
- Newton pressure law**
  - GS laws
    - . **Newton pressure law**
  - RT compressible flow
  - laminar flow
  - Newtonian fluids
  - Prandtl-Meyer expansion
  - pressure
  - pressure distribution
- Newton second law**
  - GS kinetics
    - . **Newton second law**
    - laws

- . **Newton second law**
- RT conservation
- momentum theory
- Newton Theory**
- GS kinetics
- . **Newton Theory**
- theoretical physics
- . **Newton Theory**
- RT conservation laws
- Newtonian fluids
- nonNewtonian fluids
- nonrelativistic mechanics
- ∞ theories
- Newton-Busemann law**
- GS laws
- . **Newton-Busemann law**
- Newtonian fluids**
- RT anisotropic fluids
- ∞ fluids
- Navier-Stokes equation
- newton
- Newton pressure law
- Newton Theory
- nonNewtonian fluids
- stress-strain-time relations
- viscous fluids
- Newton-Raphson method**
- GS analysis (mathematics)
- . numerical analysis
- . . . approximation
- . . . . Newton methods
- . . . . **Newton-Raphson method**
- . . . iteration
- . . . . Newton methods
- . . . . **Newton-Raphson method**
- RT ∞ methodology
- Next Generation Space Telescope project**
- (added December 1999)
- DEF Project in the NASA Origins program with the goal of developing a spaceborne observatory to succeed the Hubble Space Telescope after 2005. The telescope is foreseen to have an aperture of 8 meters and be optimized for near infrared wavelengths (0. 6-10+ microns) in order to enable the exploration of the most remote high redshift universe.
- UF *NGST project*
- GS programs
- . projects
- . . **Next Generation Space Telescope project**
- RT astronomical observatories
- infrared telescopes
- James Webb Space Telescope
- NASA space programs
- spaceborne telescopes
- NGST project*
- (added December 1999)
- USE **Next Generation Space Telescope project**
- Nicaragua**
- GS nations
- . **Nicaragua**
- RT Central America
- Nichrome (trademark)**
- GS alloys
- . nickel alloys
- . . **Nichrome (trademark)**
- nickel**
- GS chemical elements
- . **nickel**
- . . nickel isotopes
- metals
- . transition metals
- . . **nickel**
- . . . nickel isotopes
- RT constantan
- nickel alloys**
- GS alloys
- . **nickel alloys**
- . . Astroloy (trademark)
- . . Hastelloy (trademark)
- . . Inconel (trademark)
- . . . kamacite
- . . . Monel (trademark)
- . . . Nichrome (trademark)
- . . . nitinol alloys
- . . . Rene 41
- . . . Rene 63
- . . . Rene 77
- . . . Rene 95
- . . . Udimet alloys
- . . . Waspaloy
- RT aluminides
- gold alloys
- heat resistant alloys
- nickel aluminides
- nimonic alloys
- Permalloys (trademark)
- shape memory alloys
- silicon alloys
- stainless steels
- sulfidation
- nickel aluminides**
- (added June 1997)
- GS aluminum compounds
- . aluminides
- . . **nickel aluminides**
- nickel compounds
- . **nickel aluminides**
- RT intermetallics
- nickel alloys
- nickel cadmium batteries**
- DEF Alkaline storage batteries in which the positive active material is nickel oxide and the negative contains cadmium.
- UF *cadmium nickel batteries*
- GS electrochemical cells
- . electric batteries
- . . storage batteries
- . . . **nickel cadmium batteries**
- RT dry cells
- silver cadmium batteries
- nickel coatings**
- GS coatings
- . metal coatings
- . . **nickel coatings**
- RT corrosion prevention
- metal films
- protective coatings
- nickel compounds**
- GS **nickel compounds**
- . cohenite
- . nickel aluminides
- . nickel fluorides
- . nickel oxides
- . schreibersite
- RT ∞ chemical compounds
- ∞ Group 8 compounds
- ∞ metal compounds
- nickel fluorides**
- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . metal fluorides
- . . . . **nickel fluorides**
- . . . halides
- . . . fluorides
- . . . . metal fluorides
- . . . . **nickel fluorides**
- . . . metal halides
- . . . . metal fluorides
- . . . . **nickel fluorides**
- nickel compounds
- . **nickel fluorides**
- nickel hydrogen batteries**
- GS electrochemical cells
- . electric batteries
- . . storage batteries
- . . . **nickel hydrogen batteries**
- RT energy storage
- hydrogen-based energy
- spacecraft power supplies
- nickel iron batteries**
- DEF Alkaline-type electric cells using potassium hydroxide as the electrolyte and anodes of steel wool substrate with active iron material and cathodes of nickel plated steel wool substrate with active nickel material.
- GS electrochemical cells
- . electric batteries
- . . **nickel iron batteries**
- RT lead acid batteries
- nickel zinc batteries
- storage batteries
- nickel isotopes**
- GS chemical elements
- . nickel
- . . **nickel isotopes**
- . nuclides
- . . isotopes
- . . . **nickel isotopes**
- metals
- . transition metals
- . . nickel
- . . . **nickel isotopes**
- nickel oxides**
- GS chalcogenides
- . oxides
- . . metal oxides
- . . . **nickel oxides**
- nickel compounds
- . **nickel oxides**
- nickel plate**
- GS plating
- . **nickel plate**
- RT electroplating
- gold coatings
- nickel steels**
- DEF Steels containing nickel as a main alloying element.
- GS alloys
- . iron alloys
- . . steels
- . . . **nickel steels**
- RT stainless steels
- nickel zinc batteries**
- UF *zinc nickel batteries*
- GS electric generators
- . direct power generators
- . . primary batteries
- . . . dry cells
- . . . . **nickel zinc batteries**
- electrochemical cells
- . electric batteries
- . . primary batteries
- . . . dry cells
- . . . . **nickel zinc batteries**
- . . . storage batteries
- . . . . **nickel zinc batteries**
- RT nickel iron batteries
- nicotinamide**
- GS bases (chemical)
- . alkaloids
- . . **nicotinamide**
- nitrogen compounds
- . alkaloids
- . . **nicotinamide**
- . amides
- . . **nicotinamide**
- organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . alkaloids
- . . . . **nicotinamide**
- vitamins
- . **nicotinamide**
- nicotine**
- GS bases (chemical)
- . alkaloids
- . . **nicotine**
- nitrogen compounds
- . alkaloids
- . . **nicotine**



## nicotinic acid

organic compounds  
. cyclic compounds  
. heterocyclic compounds  
. . . alkaloids  
. . . . **nicotine**  
RT tobacco

### nicotinic acid

GS acids  
. carboxylic acids  
. . **nicotinic acid**  
organic compounds  
. carboxylic acids  
. . **nicotinic acid**  
. cyclic compounds  
. heterocyclic compounds  
. . . **nicotinic acid**  
vitamins  
. **nicotinic acid**

### Niger

GS nations  
. **Niger**  
RT Africa

### Nigeria

GS nations  
. **Nigeria**  
RT Africa

### night

RT darkening  
darkness  
daytime  
diurnal variations  
evening  
shadows  
sky brightness  
twilight glow

### night airglow

USE **nightglow**

### night E layer

USE **E region**  
**night sky**

### night F layer

USE **F region**  
**night sky**

### night flights (aircraft)

RT ∞ aircraft  
approach control  
blind landing  
darkness  
flight instruments  
instrument approach  
instrument landing systems  
nap-of-the-earth navigation  
radar  
radio beacons  
visibility

### night sky

UF *night E layer*  
*night F layer*  
GS sky  
. **night sky**  
RT airglow  
auroras  
gegenschein  
nightglow  
sky brightness  
twilight glow  
zodiacal light

### night vision

GS vision  
. **night vision**  
RT dark adaptation  
enhanced vision  
image intensifiers  
light adaptation  
microchannels  
nap-of-the-earth navigation

### nightglow

UF *night airglow*  
GS atmospheric radiation  
. sky radiation

. . airglow  
. . . **nightglow**  
electromagnetic radiation  
. light (visible radiation)  
. . sky radiation  
. . . airglow  
. . . . **nightglow**  
RT biometeorology  
night sky  
radio auroras  
sky brightness

### nigotrons

GS electron tubes  
. vacuum tubes  
. . microwave tubes  
. . . magnetrons  
. . . . **nigotrons**  
microwave equipment  
. microwave oscillators  
. . magnetrons  
. . . **nigotrons**  
. microwave tubes  
. . magnetrons  
. . . **nigotrons**  
oscillators  
. microwave oscillators  
. . magnetrons  
. . . **nigotrons**

### Nihon aircraft

UF *NAMC aircraft*  
GS **Nihon aircraft**  
. YS-11 aircraft  
RT ∞ aircraft

### Nihon YS-11 aircraft

USE **YS-11 aircraft**

### Nike booster rocket engines

GS engines  
. rocket engines  
. . booster rocket engines  
. . . **Nike booster rocket engines**  
. . solid propellant rocket engines  
. . . **Nike booster rocket engines**  
RT ∞ Nike rockets

### Nike missiles

GS missiles  
. surface to air missiles  
. . **Nike missiles**  
. . . Nike-Ajax missile  
. . . Nike-Hercules missile  
. . . Nike-Zeus missile  
RT antiaircraft missiles  
antimissile missiles  
∞ Nike rockets  
Sentinel system

### Nike project

GS programs  
. projects  
. . **Nike project**  
RT ∞ Nike rockets

### Nike rocket vehicles

GS rocket vehicles  
. multistage rocket vehicles  
. . **Nike rocket vehicles**  
. . . Nike-Apache rocket vehicle  
. . . Nike-Cajun rocket vehicle  
. . . Nike-Hydac rocket vehicle  
. . . Nike-Iroquois rocket vehicle  
. . . Nike-Javelin rocket vehicle  
. . . Nike-Tomahawk rocket vehicle  
RT ∞ Nike rockets  
∞ vehicles

### ∞ Nike rockets

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT Nike booster rocket engines  
Nike missiles  
Nike project  
Nike rocket vehicles

### Nike X systems

GS weapon systems  
. missile systems

. . **Nike X systems**  
RT antimissile missiles  
missiles  
surface to air missiles  
∞ systems

### Nike-Ajax missile

GS missiles  
. antiaircraft missiles  
. . **Nike-Ajax missile**  
. surface to air missiles  
. . Nike missiles  
. . . **Nike-Ajax missile**  
RT Argo rocket vehicles  
EXOS sounding rocket  
liquid propellant rocket engines  
solid propellant rocket engines  
Trailblazer 1 reentry vehicle

### Nike-Apache rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Apache rocket vehicle**  
RT solid propellant rocket engines

### Nike-Cajun rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Cajun rocket vehicle**  
RT Cajun rocket vehicle  
solid propellant rocket engines

### Nike-Hercules missile

GS missiles  
. antiaircraft missiles  
. . **Nike-Hercules missile**  
. surface to air missiles  
. . Nike missiles  
. . . **Nike-Hercules missile**  
RT solid propellant rocket engines

### Nike-Hydac rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Hydac rocket vehicle**  
RT ∞ vehicles

### Nike-Iroquois rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Iroquois rocket vehicle**  
RT ∞ vehicles

### Nike-Javelin rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Javelin rocket vehicle**  
RT solid propellant rocket engines  
sounding rockets

### Nike-Tomahawk rocket vehicle

GS rocket vehicles  
. multistage rocket vehicles  
. . Nike rocket vehicles  
. . . **Nike-Tomahawk rocket vehicle**  
RT solid propellant rocket engines

### Nike-Zeus missile

UF *Zeus missile*  
GS missiles  
. antimissile missiles  
. . **Nike-Zeus missile**  
. surface to air missiles  
. . Nike missiles  
. . . **Nike-Zeus missile**  
RT solid propellant rocket engines  
Spartan missile  
Sprint missile

### nimbostratus clouds

UF *nimbus clouds*  
GS clouds (meteorology)  
. **nimbostratus clouds**  
RT cumulonimbus clouds  
precipitation (meteorology)

- stratus clouds
- Nimbus 1 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 1 satellite**  
 RT cloud photography  
 Thor Agena launch vehicle
- Nimbus 2 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 2 satellite**  
 RT cloud photography  
 Thor Agena launch vehicle
- Nimbus 3 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 3 satellite**
- Nimbus 4 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 4 satellite**
- Nimbus 5 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 5 satellite**
- Nimbus 6 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 6 satellite**
- Nimbus 7 satellite**  
 DEF One in a series of meteorological satellites.  
 GS artificial satellites  
 . meteorological satellites  
 . . Nimbus satellites  
 . . . **Nimbus 7 satellite**  
 RT Total Ozone Mapping Spectrometer
- nimbus clouds*  
 USE **nimbostratus clouds**
- Nimbus project**  
 GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Nimbus project**  
 . projects  
 . . **Nimbus project**  
 . space programs  
 . . NASA space programs  
 . . . **Nimbus project**  
 RT cloud photography  
 meteorological satellites  
 satellite observation
- Nimbus satellites**  
 GS artificial satellites  
 . meteorological satellites  
 . . **Nimbus satellites**  
 . . . Nimbus 1 satellite  
 . . . Nimbus 2 satellite  
 . . . Nimbus 3 satellite  
 . . . Nimbus 4 satellite  
 . . . Nimbus 5 satellite  
 . . . Nimbus 6 satellite  
 . . . Nimbus 7 satellite  
 RT cloud photography  
 ESSA satellites  
 infrared photography  
 satellite observation  
 Thor Agena launch vehicle
- nimonic alloys**  
 GS alloys  
 . heat resistant alloys  
 . . **nimonic alloys**  
 RT iron alloys
- nickel alloys
- NIMPHE (engine)*  
 USE **hydrazine engines**
- Nimrod accelerator**  
 GS particle accelerators  
 . **Nimrod accelerator**  
 RT ∞ accelerators
- niobates**  
 GS niobium compounds  
 . **niobates**  
 . . lithium niobates  
 RT euxenite  
 oxides  
 ∞ oxygen compounds
- niobium**  
 UF *columbium*  
 GS chemical elements  
 . **niobium**  
 . . niobium isotopes  
 . . . niobium 95  
 metals  
 . refractory metals  
 . . **niobium**  
 . . . niobium isotopes  
 . . . . niobium 95  
 . transition metals  
 . . **niobium**  
 . . . niobium isotopes  
 . . . . niobium 95  
 refractory materials  
 . refractory metals  
 . . **niobium**  
 . . . niobium isotopes  
 . . . . niobium 95
- niobium 95**  
 GS chemical elements  
 . niobium  
 . . niobium isotopes  
 . . . **niobium 95**  
 . nuclides  
 . . isotopes  
 . . . niobium isotopes  
 . . . . **niobium 95**  
 . . . radioactive isotopes  
 . . . . **niobium 95**  
 metals  
 . refractory metals  
 . . niobium  
 . . . niobium isotopes  
 . . . . **niobium 95**  
 . transition metals  
 . . niobium  
 . . . niobium isotopes  
 . . . . **niobium 95**  
 refractory materials  
 . refractory metals  
 . . niobium  
 . . . niobium isotopes  
 . . . . **niobium 95**
- niobium alloys**  
 GS alloys  
 . heat resistant alloys  
 . . refractory metal alloys  
 . . . **niobium alloys**  
 refractory materials  
 . refractory metal alloys  
 . . **niobium alloys**  
 RT hafnium alloys
- niobium carbides**  
 GS carbon compounds  
 . carbides  
 . . **niobium carbides**  
 niobium compounds  
 . **niobium carbides**
- niobium compounds**  
 GS **niobium compounds**  
 . niobates  
 . . lithium niobates  
 . niobium carbides  
 . niobium iodides  
 . niobium oxides  
 . niobium stannides
- RT ∞ chemical compounds  
 ∞ Group 5B compounds  
 ∞ metal compounds
- niobium iodides**  
 GS halogen compounds  
 . halides  
 . . metal halides  
 . . . **niobium iodides**  
 . iodine compounds  
 . . iodides  
 . . . **niobium iodides**  
 niobium compounds  
 . **niobium iodides**
- niobium isotopes**  
 GS chemical elements  
 . niobium  
 . . **niobium isotopes**  
 . . . niobium 95  
 . nuclides  
 . . isotopes  
 . . . **niobium isotopes**  
 . . . . niobium 95  
 metals  
 . refractory metals  
 . . niobium  
 . . . **niobium isotopes**  
 . . . . niobium 95  
 . transition metals  
 . . niobium  
 . . . **niobium isotopes**  
 . . . . niobium 95  
 refractory materials  
 . refractory metals  
 . . niobium  
 . . . **niobium isotopes**  
 . . . . niobium 95
- niobium oxides**  
 GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . **niobium oxides**  
 niobium compounds  
 . **niobium oxides**
- niobium stannides**  
 GS niobium compounds  
 . **niobium stannides**  
 tin compounds  
 . stannides  
 . . **niobium stannides**
- NIPS (system)*  
 USE **NASA Interactive Planning System**
- nitinol alloys**  
 DEF Shape memory alloys of titanium and nickel.  
 GS alloys  
 . nickel alloys  
 . . **nitinol alloys**  
 . shape memory alloys  
 . . **nitinol alloys**  
 . titanium alloys  
 . . **nitinol alloys**  
 ferroelastic materials  
 . shape memory alloys  
 . . **nitinol alloys**
- nitramine propellants**  
 GS propellants  
 . rocket propellants  
 . . **nitramine propellants**  
 . solid propellants  
 . . **nitramine propellants**  
 RT oxidizers
- nitrasol explosives**  
 GS explosives  
 . **nitrasol explosives**  
 propellants  
 . **nitrasol explosives**
- nitrate esters**  
 GS esters  
 . **nitrate esters**  
 . . isopropyl nitrate  
 . . propyl nitrate

## nitrates

- nitrogen compounds
  - . **nitrate esters**
  - . . isopropyl nitrate
  - . . propyl nitrate
- nitrates**
  - GS nitrogen compounds
    - . **nitrates**
    - . . dinitrates
    - . . inorganic nitrates
    - . . . ammonium nitrates
    - . . . hydrazine nitrate
    - . . . potassium nitrates
    - . . . silver nitrates
    - . . . sodium nitrates
    - . . methyl nitrate
    - . . organic nitrates
    - . . . cellulose nitrate
    - . . . nitroforms
    - . . . . hydrazine nitroform
    - . . . nitroglycerin
    - . . . PETN
- nitration**
  - GS chemical reactions
    - . **nitration**
  - RT denitrogenation
- nitric acid**
  - GS acids
    - . **nitric acid**
    - nitrogen compounds
    - . **nitric acid**
  - RT nitrous acid
- nitric oxide**
  - GS chalcogenides
    - . oxides
    - . . nitrogen oxides
    - . . . **nitric oxide**
    - nitrogen compounds
    - . nitrogen oxides
    - . . **nitric oxide**
  - RT nitrosyls
- nitrides**
  - GS nitrogen compounds
    - . **nitrides**
    - . . boron nitrides
    - . . metal nitrides
    - . . . aluminum nitrides
    - . . . beryllium nitrides
    - . . . gallium nitrides
    - . . . tantalum nitrides
    - . . . titanium nitrides
    - . . . zirconium nitrides
    - . . carbon nitrides
    - . . oxynitrides
    - . . silicon nitrides
  - RT ceramic nuclear fuels
    - molten salts
- nitriding**
  - GS chemical reactions
    - . **nitriding**
    - hardening (materials)
    - . **nitriding**
    - heat treatment
    - . **nitriding**
- nitriles**
  - GS nitrogen compounds
    - . **nitriles**
    - . . acetonitrile
    - . . acrylonitriles
    - . . . polyacrylonitrile
    - . . malononitrile
    - . . phosphonitriles
    - . . succinonitrile
    - organic compounds
    - . **nitriles**
    - . . acetonitrile
    - . . acrylonitriles
    - . . . polyacrylonitrile
    - . . malononitrile
    - . . phosphonitriles
    - . . succinonitrile
- RT cyano compounds
- nitrites**
  - GS nitrogen compounds
    - . **nitrites**
- nitro compounds**
  - GS nitrogen compounds
    - . **nitro compounds**
    - . . nitrobenzenes
    - . . . trinitrotoluene
    - . . nitroglycerin
    - . . nitroguanidine
    - . . nitromethane
    - . . nitropropane
    - . . picrates
    - . . . ammonium picrates
    - . . polybutadiene tetranitramine
    - . . tetryl
    - . . trinitro compounds
  - RT ∞ chemical compounds
- nitroamines**
  - GS nitrogen compounds
    - . **nitroamines**
    - organic compounds
    - . amines
    - . . **nitroamines**
- nitrobacter**
  - GS microorganisms
    - . bacteria
    - . . **nitrobacter**
- nitrobenzenes**
  - GS nitrogen compounds
    - . nitro compounds
    - . . **nitrobenzenes**
    - . . . trinitrotoluene
- nitrocellulose*
  - USE **cellulose nitrate**
- nitrofluoramines**
  - GS halogen compounds
    - . fluorine compounds
    - . . fluoro compounds
    - . . . fluorine organic compounds
    - . . . . fluoroamines
    - . . . . . **nitrofluoramines**
    - nitrogen compounds
    - . **nitrofluoramines**
    - organic compounds
    - . amines
    - . . fluoroamines
    - . . . **nitrofluoramines**
    - . . fluorine organic compounds
    - . . fluoroamines
    - . . . **nitrofluoramines**
- nitroformates**
  - GS formates
    - . **nitroformates**
    - nitrogen compounds
    - . **nitroformates**
- nitroforms**
  - GS esters
    - . organic nitrates
    - . . **nitroforms**
    - . . . hydrazine nitroform
    - nitrogen compounds
    - . nitrates
    - . . organic nitrates
    - . . . **nitroforms**
    - . . . . hydrazine nitroform
- nitrogen**
  - GS chemical elements
    - . **nitrogen**
    - . . liquid nitrogen
    - . . nitrogen isotopes
    - . . . nitrogen 15
    - . . . nitrogen 16
    - . . solid nitrogen
    - gases
    - . **nitrogen**
    - . . liquid nitrogen
    - . . nitrogen isotopes
    - . . . nitrogen 15
  - . . . nitrogen 16
  - . . solid nitrogen
  - RT Kjeldahl method
  - nitrogen atoms
  - nitrogen ions
  - nitrogen lasers
  - nitrogenation
  - nitrolysis
  - reaction bonding
  - sialon
  - Vegard-Kaplan bands
  - Wolf-Rayet stars
- nitrogen 15**
  - GS chemical elements
    - . nitrogen
    - . . nitrogen isotopes
    - . . . **nitrogen 15**
    - . . nuclides
    - . . isotopes
    - . . . nitrogen isotopes
    - . . . . **nitrogen 15**
    - gases
    - . nitrogen
    - . . nitrogen isotopes
    - . . . **nitrogen 15**
- nitrogen 16**
  - GS chemical elements
    - . nitrogen
    - . . nitrogen isotopes
    - . . . **nitrogen 16**
    - . . nuclides
    - . . isotopes
    - . . . nitrogen isotopes
    - . . . . **nitrogen 16**
    - . . . . . **nitrogen 16**
    - gases
    - . nitrogen
    - . . nitrogen isotopes
    - . . . **nitrogen 16**
- nitrogen atoms**
  - GS atoms
    - . **nitrogen atoms**
  - RT nitrogen
- nitrogen compounds**
  - GS **nitrogen compounds**
    - . alkaloids
    - . . atropine
    - . . betaines
    - . . caffeine
    - . . colchicine
    - . . ergotamine
    - . . hyoscine
    - . . lysergine
    - . . morphine
    - . . nicotinamide
    - . . nicotine
    - . . pilocarpine
    - . . reserpine
    - . . strychnine
    - . . tropanyl compounds
    - . amides
    - . . acetanilide
    - . . acetazolamide
    - . . carbamides
    - . . cyanamides
    - . . formhydroxamic acid
    - . . nicotinamide
    - . . oxamic acids
    - . . polyimides
    - . . . bismaleimide
    - . . . Kapton (trademark)
    - . . succinimides
    - . . ureas
    - . . . difluorourea
    - . . . thioureas
    - . . . thiuronium
    - . ammonia
    - . . liquid ammonia
    - . . azides (inorganic)
    - . . hydrogen azides
    - . . sodium azides
    - . . azides (organic)
    - . . sodium azides
    - . . triaminoguanidinium azide
    - . . azo compounds

- . . HMX
- . . RDX
- . cyano compounds
- . . cyanamides
- . . cyanoacetylene
- . . isocyanates
- . . . diisocyanates
- . . . fulminates
- . folic acid
- . hydrazinium compounds
- . hydrazoic acid
- . hydrazones
- . hydrocyanic acid
- . imides
- . . bismaleimide
- . . phthalimides
- . . succinimides
- . imines
- . nitrate esters
- . . isopropyl nitrate
- . . propyl nitrate
- . nitrates
- . . dinitrates
- . . inorganic nitrates
- . . . ammonium nitrates
- . . . hydrazine nitrate
- . . . potassium nitrates
- . . . silver nitrates
- . . . sodium nitrates
- . . methyl nitrate
- . . organic nitrates
- . . . cellulose nitrate
- . . . nitroforms
- . . . . hydrazine nitroform
- . . . nitroglycerin
- . . . PETN
- . nitric acid
- . nitrides
- . . boron nitrides
- . . metal nitrides
- . . . aluminum nitrides
- . . . beryllium nitrides
- . . . gallium nitrides
- . . . tantalum nitrides
- . . . titanium nitrides
- . . . zirconium nitrides
- . carbon nitrides
- . . oxynitrides
- . . silicon nitrides
- . nitrites
- . nitro compounds
- . . nitrobenzenes
- . . . trinitrotoluene
- . . nitroglycerin
- . . nitroguanidine
- . . nitromethane
- . . nitropropane
- . . picrates
- . . . ammonium picrates
- . . polybutadiene tetranitramine
- . . tetryl
- . . . trinitro compounds
- . nitroamines
- . nitrofluoramines
- . nitroformates
- . nitrogen fluorides
- . nitrogen hydrides
- . . amino radical
- . nitrogen oxides
- . . nitric oxide
- . . nitrogen dioxide
- . . nitrogen tetroxide
- . . nitrous oxides
- . nitrogen polymers
- . . polyacrylonitrile
- . . polybenzimidazole
- . . polybutadiene tetranitramine
- . . Pyrrones (trademark)
- . nitrosamine
- . nitroso compounds
- . nitrosyls
- . . . nitrosyl chlorides
- . nitroxychlorides
- . nitryl chlorides
- . nitryl fluorides
- . quinoline
- . thiazine (trademark)
- . thymine
- . trinitramine
- . . tryptophan
- . uracil
- . xanthines
- . . caffeine
- . . guanines
- . . uric acid
- . nitriles
- . . acetonitrile
- . . acrylonitriles
- . . . polyacrylonitrile
- . . malononitrile
- . . phosphonitriles
- . . succinonitrile
- RT ∞ chemical compounds
- ∞ Group 5A compounds
- phosphazene
- nitrogen dioxide**
- GS chalcogenides
- . oxides
- . . nitrogen oxides
- . . . **nitrogen dioxide**
- nitrogen compounds
- . nitrogen oxides
- . . **nitrogen dioxide**
- nitrogen fixation*
- USE **nitrogenation**
- nitrogen fluorides**
- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . **nitrogen fluorides**
- . . halides
- . . fluorides
- . . . **nitrogen fluorides**
- nitrogen compounds
- . **nitrogen fluorides**
- nitrogen hydrides**
- GS hydrogen compounds
- . hydrides
- . . **nitrogen hydrides**
- . . . amino radical
- nitrogen compounds
- . **nitrogen hydrides**
- . . amino radical
- RT ammonia
- hydrazoic acid
- nitrogen ions**
- GS ions
- . **nitrogen ions**
- RT negative ions
- nitrogen
- nitrogen isotopes**
- GS chemical elements
- . nitrogen
- . . **nitrogen isotopes**
- . . . nitrogen 15
- . . . nitrogen 16
- . nuclides
- . . isotopes
- . . . **nitrogen isotopes**
- . . . . nitrogen 15
- . . . . nitrogen 16
- gases
- . nitrogen
- . . **nitrogen isotopes**
- . . . nitrogen 15
- . . . nitrogen 16
- nitrogen lasers**
- DEF Stimulated emission devices in which the nitrogen molecule is the lasing medium.
- GS stimulated emission devices
- . lasers
- . . gas lasers
- . . . **nitrogen lasers**
- RT lasing
- nitrogen
- population inversion
- pulsed lasers
- ultraviolet lasers
- nitrogen metabolism**
- GS metabolism
- . **nitrogen metabolism**
- RT biochemistry
- ∞ biology
- enzymology
- hydrogen metabolism
- nutrition
- nitrogen oxides**
- GS chalcogenides
- . oxides
- . . **nitrogen oxides**
- . . . nitric oxide
- . . . nitrogen dioxide
- . . . nitrogen tetroxide
- . . nitrous oxides
- nitrogen compounds
- . **nitrogen oxides**
- . . nitric oxide
- . . nitrogen dioxide
- . . nitrogen tetroxide
- . . nitrous oxides
- RT nitrosyls
- nitrous acid
- photochemical oxidants
- nitrogen plasma**
- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **nitrogen plasma**
- . . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **nitrogen plasma**
- nitrogen polymers**
- GS nitrogen compounds
- . **nitrogen polymers**
- . . polyacrylonitrile
- . . polybenzimidazole
- . . polybutadiene tetranitramine
- . . Pyrrones (trademark)
- RT ∞ polymers
- nitrogen tetroxide**
- GS chalcogenides
- . oxides
- . . nitrogen oxides
- . . . **nitrogen tetroxide**
- nitrogen compounds
- . nitrogen oxides
- . . **nitrogen tetroxide**
- RT liquid rocket propellants
- rocket oxidizers
- nitrogenation**
- UF *nitrogen fixation*
- GS chemical reactions
- . **nitrogenation**
- RT leguminous plants
- lightning
- nitrogen
- nitroglycerin**
- GS esters
- . organic nitrates
- . . **nitroglycerin**
- nitrogen compounds
- . nitrates
- . . organic nitrates
- . . . **nitroglycerin**
- . . nitro compounds
- . . . **nitroglycerin**
- RT double base propellants
- double base rocket propellants
- dynamite
- explosives
- glycerides
- glycerols
- nitroguanidine**
- UF *HBNQ*
- GS nitrogen compounds
- . nitro compounds
- . . **nitroguanidine**
- RT explosives

## nitrolysis

solid propellants

### nitrolysis

- GS chemical reactions
  - . **nitrolysis**
  - decomposition
    - . **nitrolysis**
- RT cracking (chemical engineering)  
nitrogen

### nitromethane

- GS nitrogen compounds
  - . nitro compounds
  - . . **nitromethane**
- RT BSX  
explosives

### nitronium compounds

- GS **nitronium compounds**
  - . nitronium perchlorate
- RT ∞ chemical compounds

### nitronium perchlorate

- GS halogen compounds
  - . chlorine compounds
  - . . perchlorates
  - . . . **nitronium perchlorate**
- nitronium compounds
  - . **nitronium perchlorate**
- RT rocket oxidizers

### nitropropane

- GS nitrogen compounds
  - . nitro compounds
  - . . **nitropropane**
- organic compounds
  - . hydrocarbons
  - . . aliphatic hydrocarbons
  - . . . alkanes
  - . . . . **nitropropane**
- RT propane

### nitrosamine

- GS nitrogen compounds
  - . **nitrosamine**
- organic compounds
  - . amines
  - . . **nitrosamine**

### nitroso compounds

- GS nitrogen compounds
  - . **nitroso compounds**
  - . . nitrosyls
  - . . . nitrosyl chlorides
- RT ∞ chemical compounds
  - organic compounds

### nitrosyl chlorides

- GS halogen compounds
  - . chlorine compounds
  - . . chlorides
  - . . . **nitrosyl chlorides**
- halides
  - . . chlorides
  - . . . **nitrosyl chlorides**
- nitrosyls
  - . . **nitrosyl chlorides**
- nitrogen compounds
  - . nitroso compounds
  - . . nitrosyls
  - . . . **nitrosyl chlorides**

### nitrosyls

- GS halogen compounds
  - . **nitrosyls**
  - . . nitrosyl chlorides
- nitrogen compounds
  - . nitroso compounds
  - . . **nitrosyls**
  - . . . nitrosyl chlorides
- RT amines
  - esters
  - halides
  - nitric oxide
  - nitrogen oxides

### nitrous acid

- RT air pollution
  - atmospheric chemistry
  - nitric acid

nitrogen oxides  
reaction kinetics

### nitrous oxides

- GS chalcogenides
  - . oxides
  - . . nitrogen oxides
  - . . . **nitrous oxides**
- nitrogen compounds
  - . nitrogen oxides
  - . . **nitrous oxides**

### nitroxyl chlorides

- GS halogen compounds
  - . chlorine compounds
  - . . chlorides
  - . . . **nitroxyl chlorides**
- halides
  - . . chlorides
  - . . . **nitroxyl chlorides**
- nitrogen compounds
  - . **nitroxyl chlorides**

### nitryl chlorides

- GS halogen compounds
  - . chlorine compounds
  - . . chlorides
  - . . . **nitryl chlorides**
- halides
  - . . chlorides
  - . . . **nitryl chlorides**
- nitrogen compounds
  - . **nitryl chlorides**

### nitryl fluorides

- GS halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . **nitryl fluorides**
- halides
  - . . fluorides
  - . . . **nitryl fluorides**
- nitrogen compounds
  - . **nitryl fluorides**

### Nix

- (added September 2006)
- DEF Natural satellite of Pluto discovered May 2005.
- GS celestial bodies
  - . natural satellites
  - . . Pluto satellites
  - . . . **Nix**
- RT Hydra  
Pluto (planet)

### NMR

USE **nuclear magnetic resonance**

### n-n junctions

- GS semiconductor junctions
  - . **n-n junctions**

### NOAA 2 satellite

- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 2 satellite**

### NOAA 3 satellite

- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 3 satellite**

### NOAA 4 satellite

- DEF One of a series of meteorological satellites launched by NASA for the National Oceanic and Atmospheric Administration.
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 4 satellite**

### NOAA 5 satellite

- DEF One of a series of environmental satellites launched by NASA for the National Oceanic and Atmospheric Administration for the sensing and recording of atmospheric, hydrological, and oceanographic environmental data.
- GS artificial satellites

. meteorological satellites  
. . NOAA satellites  
. . . **NOAA 5 satellite**

### NOAA 6 satellite

- DEF Designation for a NOAA meteorological satellite conforming to the TIROS N configuration.
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 6 satellite**
- TIROS satellites
  - . . . TIROS N series satellites
  - . . . . **NOAA 6 satellite**
- RT Advanced Very High Resolution Radiometer

### NOAA 7 satellite

- DEF Designation for the seventh NOAA meteorological satellite conforming to the TIROS N configuration.
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 7 satellite**
- RT Advanced Very High Resolution Radiometer  
TIROS N series satellites

### NOAA 8 satellite

- UF *NOAA E*
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 8 satellite**
- RT Advanced Very High Resolution Radiometer  
SarSat

### NOAA 9 satellite

- (added July 1990)
- UF *NOAA F satellite*
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 9 satellite**

### NOAA 10 satellite

- (added July 1990)
- UF *NOAA G satellite*
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 10 satellite**

### NOAA 11 satellite

- (added May 1997)
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 11 satellite**
- RT Advanced Very High Resolution Radiometer  
Solar Backscatter UV Spectrometer

### NOAA 12 satellite

- (added May 1997)
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 12 satellite**
- RT Advanced Very High Resolution Radiometer  
microwave sounding

### NOAA 14 satellite

- (added May 1997)
- GS artificial satellites
  - . meteorological satellites
  - . . NOAA satellites
  - . . . **NOAA 14 satellite**
- RT Solar Backscatter UV Spectrometer

### NOAA 19 satellite

- (added April 2009)
- UF *NOAA-N Prime Environmental Satellite*
- GS artificial satellites
  - . meteorological satellites

.. NOAA satellites  
 ... **NOAA 19 satellite**  
 RT Advanced Microwave Sounding Unit  
 atmospheric sounding  
 environmental monitoring  
 remote sensing  
 satellite observation  
 satellite sounding  
 weather forecasting

NOAA E  
 USE **NOAA 8 satellite**

NOAA F satellite  
 USE **NOAA 9 satellite**

NOAA G satellite  
 USE **NOAA 10 satellite**

#### NOAA satellites

GS artificial satellites  
 . meteorological satellites  
 . . . **NOAA satellites**  
 . . . NOAA 2 satellite  
 . . . NOAA 3 satellite  
 . . . NOAA 4 satellite  
 . . . NOAA 5 satellite  
 . . . NOAA 6 satellite  
 . . . NOAA 7 satellite  
 . . . NOAA 8 satellite  
 . . . NOAA 9 satellite  
 . . . NOAA 10 satellite  
 . . . NOAA 11 satellite  
 . . . NOAA 12 satellite  
 . . . NOAA 14 satellite  
 . . . NOAA 19 satellite  
 RT Advanced Microwave Sounding Unit  
 SMS 1  
 SMS 2

NOAA-N Prime Environmental Satellite  
 (added April 2009)  
 USE **NOAA 19 satellite**

#### nobelium

GS chemical elements  
 . actinide series  
 . transuranium elements  
 . . . **nobelium**  
 . nuclides  
 . isotopes  
 . . . radioactive isotopes  
 . . . transuranium elements  
 . . . . . **nobelium**  
 metals  
 . actinide series  
 . transuranium elements  
 . . . **nobelium**  
 RT nobelium isotopes

#### nobelium isotopes

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . **nobelium isotopes**  
 RT nobelium

#### noble gases

USE **rare gases**

#### noble metals

UF *precious metals*  
 GS metals  
 . **noble metals**  
 . gold  
 . . . gold isotopes  
 . . . gold 198  
 . ruthenium  
 . . . ruthenium isotopes  
 . silver  
 . . . silver isotopes  
 RT ∞ Group 1B compounds

#### noctilucent

USE **luminescence**

#### noctilucent clouds

DEF Clouds of unknown composition which occur at great heights, 75 to 90 kilometers. They resemble thin cirrus clouds, but usually with a bluish or silverish color, although sometimes

orange to red, standing out against a dark night sky. Sometimes called luminous clouds.

GS clouds (meteorology)  
 . **noctilucent clouds**  
 RT luminescence

#### nocturnal variations

GS variations  
 . magnetic variations  
 . . **nocturnal variations**  
 . periodic variations  
 . . **nocturnal variations**  
 RT diurnal variations  
 geomagnetic micropulsations  
 geomagnetic pulsations

#### nodes (standing waves)

DEF Points, lines, or surfaces in standing waves where some characteristic of the wave field has essentially zero amplitude.

RT antinodes  
 harmonics  
 resonant frequencies  
 standing waves  
 vibration  
 wavelengths  
 ∞ waves

#### nodules

RT leguminous plants  
 particles  
 spheres  
 spherulites

#### NOE navigation

USE **nap-of-the-earth navigation**

#### NOESS

SN (NATIONAL OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM)  
 DEF The acronym for the National Operational Environmental Satellite System. This term is no longer in use. Used for National Operational Environmental Sat Sys.

UF *National Operational Environmental Sat Sys*  
 RT meteorological satellites  
 meteorology  
 NASA programs  
 observation  
 ∞ systems

#### ∞ noise

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF Any undesired signal (electrical or acoustic) that tends to interfere with the reception, interpretation, or processing of the desired signal.

RT background noise  
 continuous noise  
 effective perceived noise levels  
 electromagnetic noise  
 hum  
 information theory  
 noise (sound)  
 noise injuries  
 noise propagation  
 noise spectra  
 random noise  
 signal to noise ratios  
 spatial filtering  
 white noise

#### noise (sound)

UF *noise hazards*  
 GS elastic waves  
 . sound waves  
 . . **noise (sound)**  
 . . . aircraft noise  
 . . . blade slap noise  
 . . . jet aircraft noise  
 . . . propeller noise  
 . . . sonic booms  
 . . . engine noise  
 . . . rocket engine noise  
 . . . flow noise  
 . . . thermal noise  
 . . . aerodynamic noise  
 . . . . . blade slap noise

. . . . . propeller noise  
 . . . . . screech tones

RT acoustics  
 aeolian tones  
 aircraft hazards  
 ambience  
 auditory stimuli  
 auditory tasks  
 background noise  
 echoes  
 effective perceived noise levels  
 flight hazards  
 human factors engineering  
 hypersonic shock  
 jet blast effects  
 loudness  
 loudness  
 mufflers  
 ∞ noise  
 noise measurement  
 noise spectra  
 operational hazards  
 random noise  
 random vibration  
 reverberation  
 shock waves  
 sound pressure  
 underwater acoustics  
 white noise

#### noise attenuation

USE **noise reduction**

#### noise elimination

USE **noise reduction**

#### noise generators

RT electromagnetic noise  
 ∞ generators  
 radio frequency interference  
 random noise  
 sound generators  
 sound propagation

#### noise hazards

USE **hazards noise (sound)**

#### noise injuries

GS injuries  
 . **noise injuries**  
 RT ear protectors  
 ∞ noise

#### noise intensity

RT aircraft noise  
 auditory stimuli  
 effective perceived noise levels  
 electromagnetic noise  
 ∞ intensity  
 propeller noise  
 psychoacoustics  
 sirens  
 sound intensity

#### noise measurement

GS acoustic measurement  
 . **noise measurement**  
 RT aerodynamic noise  
 aircraft noise  
 background noise  
 jet aircraft noise  
 loudness  
 ∞ measurement  
 noise (sound)  
 propeller noise  
 sound intensity

#### noise meters

SN (LIMITED TO ACOUSTIC NOISE)  
 GS measuring instruments  
 . **noise meters**  
 RT acoustic measurement  
 field intensity meters  
 pressure measurement

#### noise pollution

DEF Objectional or harmful levels of noise.  
 GS pollution  
 . **noise pollution**  
 RT acoustics

## noise prediction

audio frequencies  
environment effects  
environment pollution  
environmental quality  
human reactions  
human tolerances  
physiological effects  
physiological factors  
sound waves

### noise prediction

DEF Estimation of intensity and frequencies based on analyses of probable oscillation of vibration producing components.

GS predictions  
. **noise prediction**  
. . noise prediction (aircraft)  
RT Ffowcs Williams-Hawkins equation

### noise prediction (aircraft)

DEF Estimating or forecasting of aircraft noise. Used for aircraft noise prediction.

UF *aircraft noise prediction*  
GS predictions  
. noise prediction  
. . **noise prediction (aircraft)**  
RT aeroacoustics  
∞ aircraft  
aircraft noise  
computational aeroacoustics  
estimates  
Ffowcs Williams-Hawkins equation  
forecasting  
propeller noise  
sound waves

### noise propagation

RT acoustics  
coherence coefficient  
continuous noise  
far fields  
∞ noise  
signal to noise ratios  
sound propagation

### noise reduction

UF *noise attenuation*  
*noise elimination*  
*noise suppressors*  
RT acoustic attenuation  
acoustic ducts  
acoustic retrofitting  
acoustics  
aerodynamic noise  
aircraft noise  
coaxial nozzles  
ear protectors  
echo suppressors  
effective perceived noise levels  
electrical grounding  
electromagnetic interference  
electromagnetic noise  
flight rules  
grazing flow  
Helmholtz resonators  
interference immunity  
isolators  
jet aircraft noise  
loudness  
mufflers  
propeller noise  
quiet engine program  
∞ reduction  
shock wave attenuation  
silence  
squelch circuits  
suppressors  
synchrophasing  
vibration isolators

### noise spectra

GS spectra  
. **noise spectra**  
RT acoustic frequencies  
background noise  
channel noise  
electromagnetic compatibility  
electromagnetic noise  
electromagnetic spectra  
∞ noise

noise (sound)  
radiation spectra  
random noise  
random signals  
shock spectra  
signal to noise ratios  
white noise

### noise storms

GS storms  
. **noise storms**  
RT cosmic noise  
electromagnetic noise  
ionospheric storms  
magnetic storms  
radio frequency interference  
solar storms

### noise suppressors

USE **noise reduction**

### noise temperature

GS temperature  
. **noise temperature**  
RT electromagnetic noise  
electron energy  
electron states  
temperature measurement  
thermal noise

### noise threshold

RT auditory fatigue  
auditory perception  
background noise  
signal to noise ratios  
∞ thresholds

### noise tolerance

RT hazards  
human tolerances  
tolerances (physiology)

### Nomad launch vehicle

GS launch vehicles  
. **Nomad launch vehicle**  
rocket vehicles  
. single stage rocket vehicles  
. . **Nomad launch vehicle**  
RT Atlas launch vehicles  
liquid propellant rocket engines

### nomenclatures

RT definition  
descriptions  
dictionaries  
mnemonics  
naming  
semantics  
symbols  
terminology  
thesauri

### nominal values

USE **approximation**

### nomograms

USE **nomographs**

### nomographs

DEF On charts or graphs, lines of constant value of given quantities with respect to either space or time. Used for isopleths and nomograms.

UF *isopleths*  
*nomograms*  
GS analysis (mathematics)  
. numerical analysis  
. . **nomographs**  
RT charts  
graphs (charts)

### nonadiabatic conditions

DEF In thermodynamics, changes in volume, temperature, flow, etc., accompanied by a transfer of heat.

GS conditions  
. **nonadiabatic conditions**  
RT energy transfer  
heat transfer  
nonisothermal processes

thermodynamics

### nonadiabatic processes

USE **heat transfer**

### nonadiabatic theory

RT adiabatic equations  
charged particles  
energy dissipation  
ionization cross sections  
magnetic disturbances  
∞ theories  
wave propagation

### nonanes

GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . alkanes  
. . . . **nonanes**

### nonaqueous electrolytes

GS conductors  
. electrolytes  
. . **nonaqueous electrolytes**  
RT electric batteries  
∞ electric cells  
electrochemistry  
electrolytic cells  
primary batteries  
storage batteries  
wet cells

### noncondensable gases

GS gases  
. **noncondensable gases**  
RT critical temperature  
gas-liquid interactions  
liquefaction

### nonconductors

USE **electrical insulation**

### nonconservative forces

RT conservation  
conservation equations  
conservation laws  
continuity equation  
∞ force

### nondestructive tests

DEF Testing that does not alter the material under test in a permanent manner or introduce any permanent changes to the material properties and structure.

UF *flaw detection*  
GS **nondestructive tests**  
. neutron radiography  
RT acoustic emission  
acoustic imaging  
adhesion tests  
chemical tests  
destructive tests  
electronic equipment tests  
engine tests  
ground penetrating radar  
hardness tests  
high temperature tests  
infrared inspection  
inspection  
load tests  
low temperature tests  
∞ materials tests  
nonintrusive measurement  
photoacoustic microscopy  
preventive maintenance  
quality control  
radiography  
reliability  
SH waves  
shearography  
static tests  
structural health monitoring  
∞ tests  
thermography  
tolerances (mechanics)  
ultrasonic flaw detection  
ultrasonic spectroscopy  
ultrasonic tests

- x ray inspection
- nonelectrolytes**
  - RT electrolytes
- nonequilibrium conditions**
  - GS conditions
  - . **nonequilibrium conditions**
  - RT ∞ equilibrium
  - unsteady state
- nonequilibrium drag*
  - USE **friction drag**
- nonequilibrium flow**
  - GS fluid flow
  - . gas flow
  - . . **nonequilibrium flow**
  - RT equilibrium flow
  - ∞ fluids
  - heat transmission
  - oscillating flow
  - quasi-steady states
  - unsteady flow
- nonequilibrium ionization**
  - GS ionization
  - . **nonequilibrium ionization**
- nonequilibrium plasmas**
  - GS particles
  - . charged particles
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **nonequilibrium plasmas**
  - . corpuscular radiation
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **nonequilibrium plasmas**
  - RT magnetohydrodynamic stability
  - nonuniform plasmas
  - plasma composition
  - plasma potentials
  - plasma radiation
  - plasma sheaths
  - rotating plasmas
- nonequilibrium radiation**
  - GS electromagnetic radiation
  - . **nonequilibrium radiation**
  - RT nonthermal radiation
  - shock wave propagation
- nonequilibrium thermodynamics**
  - GS thermodynamics
  - . **nonequilibrium thermodynamics**
  - RT irreversible processes
- nonEuclidian geometry*
  - USE **differential geometry**
- nonferrous metals**
  - GS metals
  - . **nonferrous metals**
  - RT chemical elements
  - conductors
  - ∞ metallurgy
- nonflammable materials**
  - RT asbestos
  - fireproofing
  - ∞ inorganic materials
  - Kevlar (trademark)
  - ∞ materials
  - oxides
  - refractory materials
- nongray atmospheres**
  - RT ∞ atmospheres
  - black body radiation
  - emissivity
  - gray gas
  - planetary atmospheres
- nongray gas**
  - GS gases
  - . **nongray gas**
  - RT ∞ atmospheres
  - black body radiation
  - emissivity
  - heat transfer
- spectral emission
- thermal radiation
- thermodynamics
- nonholonomic equations**
  - GS analysis (mathematics)
  - . complex variables
  - . . **nonholonomic equations**
  - RT analytic functions
  - ∞ equations
- nonhomogeneity*
  - USE **inhomogeneity**
- noninvasive measurement**
  - (added September 1992)
  - UF *non-intrusive measurement*
  - RT flow measurement
  - laser doppler velocimeters
  - ∞ measurement
  - nondestructive tests
  - optical measurement
  - pressure sensitive paints
  - temperature measurement
  - temperature sensitive paints
- non-intrusive measurement*
  - USE **noninvasive measurement**
- nonisentropicity**
  - GS isentropic processes
  - . **nonisentropicity**
  - RT entropy
  - ∞ processes
- nonisothermal processes**
  - DEF In thermodynamics, compression or expansion of substances at nonuniform temperatures.
  - RT energy transfer
  - heat transfer
  - nonadiabatic conditions
  - pressure effects
  - ∞ processes
  - temperature gradients
  - thermodynamics
- nonisotropic plates*
  - USE **anisotropic plates**
- nonisotropy*
  - USE **anisotropy**
- nonlifting vehicles*
  - USE **ballistic vehicles**
- nonlinear equations**
  - GS algebra
  - . **nonlinear equations**
  - . . cubic equations
  - . . Duffing differential equation
  - . . Monge-Ampere equation
  - . . nonlinear evolution equations
  - . . quadratic equations
  - . . quartic equations
  - analysis (mathematics)
  - . real variables
  - . . **nonlinear equations**
  - . . . cubic equations
  - . . . Duffing differential equation
  - . . . Monge-Ampere equation
  - . . . nonlinear evolution equations
  - . . . quadratic equations
  - . . . quartic equations
  - RT Born-Infeld theory
  - differential equations
  - ∞ equations
  - field theory (algebra)
  - integral equations
  - polynomials
  - roots of equations
- nonlinear evolution equations**
  - GS algebra
  - . nonlinear equations
  - . . **nonlinear evolution equations**
  - analysis (mathematics)
  - . real variables
  - . . nonlinear equations
  - . . . **nonlinear evolution equations**
  - RT difference equations
- ∞ equations
- nonlinear feedback**
  - GS feedback
  - . **nonlinear feedback**
  - RT feedback amplifiers
  - feedback control
  - negative feedback
  - positive feedback
  - sensory feedback
  - transfer functions
- nonlinear filters**
  - RT electric filters
  - electromagnetic wave filters
  - ∞ filters
  - linear filters
- nonlinear optics**
  - DEF Study of the interaction of radiation with matter in which certain variables describing the response of the matter are not proportional to variables describing the radiation.
  - RT birefringence
  - chromophores
  - electromagnetic radiation
  - electro-optical effect
  - four-wave mixing
  - geometrical optics
  - gradient index optics
  - optical bistability
  - ∞ optics
  - quantum dots
  - quantum optics
  - quantum wires
  - Raman spectra
  - Sagnac effect
- nonlinear programming**
  - DEF An optimization problem in which any or all of the following are nonlinear in the variables: (A) the objective functions, (B) the defining relationships among the variables, the plant description, (C) the constraints.
  - GS optimization
  - . mathematical programming
  - . . **nonlinear programming**
  - research
  - . **nonlinear programming**
  - RT ∞ applications of mathematics
  - constraints
  - formalism
  - linear programming
  - operations research
  - ∞ programming
- nonlinear systems**
  - SN (DYNAMIC SYSTEMS HAVING NONLINEAR RESPONSES)
  - RT attractors (mathematics)
  - chaos
  - control equipment
  - distributed parameter systems
  - dynamic programming
  - dynamical systems
  - linear systems
  - strange attractors
  - ∞ systems
  - tracking problem
  - uncertain systems
- nonlinearity**
  - UF *quasilinearity*
  - RT differential equations
  - functions (mathematics)
  - linearity
  - magnetic amplifiers
  - variability
  - Volterra equations
- nonNewtonian flow**
  - DEF The rate of flow of a material that is not proportional to the degree of force applied.
  - GS fluid flow
  - . **nonNewtonian flow**
  - RT liquid flow
  - steady flow
  - thixotropy
  - unsteady flow
  - viscoelasticity



## nonNewtonian fluids

viscoplasticity

### nonNewtonian fluids

DEF Fluids that exhibit a viscosity which varies with changing shear stress or shear rate.

RT colloids  
∞ fluids  
  gelatins  
  gels  
  newton  
  Newton Theory  
  Newtonian fluids  
  rheology  
  shear thinning  
  viscoelasticity  
  viscoplasticity  
  viscous fluids

### nonohmic effect

RT barrier layers  
  contact resistance  
∞ effects  
  space charge

### nonoscillatory action

GS oscillations  
  . **nonoscillatory action**  
RT oscillation dampers  
  oscillators  
  vibration damping

### nonparametric statistics

GS statistical analysis  
  . **nonparametric statistics**  
RT ∞ statistics

### nonpoint sources

DEF Undetermined or general areas from which pollutants, contaminants, and/or other unwanted materials or wastes enter the environment.

RT contaminants  
  contamination  
  diffusion  
  environments  
  gases  
  liquids  
  particles  
∞ points  
  poisons  
  pollution  
  public health  
  radioactive wastes  
∞ sources  
  toxicology  
  wastes

### nonpolar gases

GS gases  
  . **nonpolar gases**  
RT molecular gases  
  rare gases

### nonreflection

USE **energy absorption**

### nonrelativistic electrons

USE **electrons**

### nonrelativistic mechanics

RT Newton Theory  
  relativity

### nonresonance

RT microwave resonance  
  transmission lines  
  traveling waves

### nonrigidity

USE **flexibility**

### nonspherical optics

USE **aspheric optics**

### nonstabilized oscillation

GS oscillations  
  . **nonstabilized oscillation**  
RT oscillation dampers  
  oscillators  
  pilot induced oscillation  
  stable oscillations

vibration damping

### nonsynchronization

RT deviation  
  incoherence  
∞ interference  
  nonuniformity

### nonthermal emission

USE **nonthermal radiation**

### nonthermal radiation

UF *nonthermal emission*  
GS electromagnetic radiation  
  . **nonthermal radiation**  
  . . cyclotron radiation  
  . . . ion cyclotron radiation  
  . . . synchrotron radiation  
RT galactic radiation  
  magnetic fields  
  nonequilibrium radiation  
∞ radiation  
  radio waves  
  thermal radiation

### nonuniform flow

GS fluid flow  
  . **nonuniform flow**  
RT flow characteristics  
  gas flow  
  turbulent flow  
  uniform flow  
  unsteady flow

### nonuniform magnetic fields

GS magnetic fields  
  . **nonuniform magnetic fields**  
RT diffraction radiation  
  lines of force  
  magnetic anomalies  
  magnetic mirrors

### nonuniform plasmas

GS particles  
  . charged particles  
  . . energetic particles  
  . . . plasmas (physics)  
  . . . . **nonuniform plasmas**  
  . corpuscular radiation  
  . . energetic particles  
  . . . plasmas (physics)  
  . . . . **nonuniform plasmas**  
RT Kelvin-Helmholtz instability  
  low density research  
  magnetohydrodynamic stability  
  nonequilibrium plasmas  
  plasma composition  
  plasma oscillations  
  plasma waves  
  rarefied plasmas

### nonuniformity

RT flexibility  
  inhomogeneity  
  irregularities  
  nonsynchronization  
  oscillations  
  turbulence

### nonviscous flow

USE **inviscid flow**

### noon

DEF The instant at which a time reference is over the upper branch of the reference meridian.  
RT daytime  
  zenith

### Nord 262 aircraft

USE **MH-262 aircraft**

### Nord 1500 aircraft

UF *Griffon aircraft*  
GS jet aircraft  
  . **Nord 1500 aircraft**  
  monoplanes  
  . **Nord 1500 aircraft**  
  Nord aircraft  
  . **Nord 1500 aircraft**  
  research vehicles  
  . research aircraft

. . **Nord 1500 aircraft**

  supersonic aircraft

  . **Nord 1500 aircraft**

RT ∞ aircraft

### Nord aircraft

GS **Nord aircraft**  
  . C-160 aircraft  
  . MH-262 aircraft  
  . Nord 1500 aircraft  
RT ∞ aircraft

### norepinephrine

DEF Precursor of epinephrine that is secreted by the adrenal medulla and is a widespread central and autonomic neurotransmitter. Norepinephrine is the principal transmitter of most postganglionic sympathetic fibers and of the diffuse projection system in the brain arising from the locus ceruleus. It is also found in plants and is used pharmacologically as a sympathomimetic.

GS drugs  
  . stimulants  
  . . **norepinephrine**  
  organic compounds  
  . amines  
  . . catecholamine  
  . . . **norepinephrine**  
RT dopamine  
  neurotransmitters

### norleucine

GS acids  
  . amino acids  
  . . leucine  
  . . . **norleucine**  
  organic compounds  
  . amino acids  
  . . leucine  
  . . . **norleucine**

### normal density functions

UF *Gaussian distributions*  
  *normal distributions*  
GS functions (mathematics)  
  . probability density functions  
  . . **normal density functions**  
  statistical analysis  
  . probability density functions  
  . . **normal density functions**  
RT continuity (mathematics)  
  discrete functions  
  histograms

### normal distributions

USE **normal density functions**

### normal force distribution

USE **force distribution**

### normal shock waves

GS elastic waves  
  . shock waves  
  . . **normal shock waves**  
RT longitudinal waves  
  magnetohydrodynamic waves  
  oblique shock waves  
  plane waves  
  shock layers

### normality

RT asymptotic properties  
  average  
  mean  
  median (statistics)  
  norms  
  statistical tests

### normalized difference vegetation index

(added June 2001)

DEF A transformation of satellite-based measurements computed as the ratio of reflectance in the red and near-infrared portions of the spectrum. Reflectance in the red region decreases with increasing chlorophyll content of the plant canopy, while reflectance in the infrared increases with increasing wet plant biomass. The index value represents greenness, density, and vigor of vegetation.

- UF *NDVI (remote sensing)*  
 GS ratios  
 . indexes (ratios)  
 . . vegetative index  
 . . . **normalized difference vegetation index**
- RT crop vigor  
 image classification  
 remote sensing  
 satellite imagery  
 vegetation
- ∞ **normalizing**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT normalizing (heat treatment)  
 normalizing (statistics)  
 regularity
- normalizing (heat treatment)**
- GS heat treatment  
 . **normalizing (heat treatment)**
- RT annealing  
 hardening (materials)  
 laser annealing
- ∞ normalizing  
 tempering
- normalizing (statistics)**
- RT evaluation  
 ∞ normalizing  
 quality control  
 ratings  
 renormalization group methods
- norms**
- GS naming  
 . **norms**
- RT average  
 ethics  
 median (statistics)  
 normality  
 psychometrics  
 value
- North America**
- GS continents  
 . **North America**
- RT Appalachian Mountains (North America)  
 Canada  
 Central America  
 Lower California (Mexico)  
 Mexico  
 tundra  
 United States  
 Williston Basin (North America)
- North American aircraft**
- GS **North American aircraft**  
 . A-2 aircraft  
 . A-5 aircraft  
 . B-1 aircraft  
 . B-70 aircraft  
 . F-86 aircraft  
 . F-100 aircraft  
 . OV-10 aircraft  
 . P-51 aircraft  
 . T-2 aircraft  
 . T-28 aircraft  
 . T-39 aircraft  
 . X-15 aircraft
- RT ∞ aircraft
- North Atlantic Treaty Organization (NATO)**
- GS organizations  
 . **North Atlantic Treaty Organization (NATO)**
- RT European Union  
 international cooperation
- North Carolina**
- GS nations  
 . United States  
 . . **North Carolina**
- RT Cape Hatteras (NC)  
 Great Smoky Mountains (NC-TN)  
 Outer Banks (NC)
- Sand Hills Region (GA-NC-SC)
- North Dakota**
- GS nations  
 . United States  
 . . **North Dakota**
- RT Missouri River (US)  
 Williston Basin (North America)
- North Korea**
- UF *Democratic Peoples Republic of Korea*
- GS nations  
 . **North Korea**
- RT Asia  
 ∞ Korea  
 South Korea
- North Polar Spur (astronomy)**
- DEF One of the largest sources of diffuse radio emission outside the galactic plane. The Spur, a ridge of enhanced emission, may be the remnant of the shells of supernovae which exploded over 100,000 years ago.
- GS electromagnetic radiation  
 . radio waves  
 . . extraterrestrial radio waves  
 . . . galactic radio waves  
 . . . . **North Polar Spur (astronomy)**  
 extraterrestrial radiation  
 . extraterrestrial radio waves  
 . . galactic radio waves  
 . . . **North Polar Spur (astronomy)**  
 . galactic radiation  
 . . galactic radio waves  
 . . . **North Polar Spur (astronomy)**
- RT nebulae  
 supernova remnants  
 x ray spectra
- North Sea**
- GS seas  
 . **North Sea**
- RT English Channel
- North Vietnam*  
 USE **Vietnam**
- Northern Hemisphere**
- GS **Northern Hemisphere**  
 . Arctic regions  
 . . subarctic regions
- RT ∞ hemispheres  
 northern sky  
 Southern Hemisphere
- Northern Ireland**  
*(added November 1989)*
- GS nations  
 . United Kingdom  
 . . **Northern Ireland**
- RT Europe
- northern sky**
- DEF That part of the sky visible from the northern hemisphere.
- RT astronomical catalogs  
 astronomical coordinates  
 astronomical observatories  
 Northern Hemisphere  
 sky surveys (astronomy)  
 Southern sky
- Northrop aircraft**
- GS **Northrop aircraft**  
 . A-9 aircraft  
 . F-5 aircraft  
 . F-18 aircraft  
 . F-20 aircraft  
 . F-89 aircraft  
 . T-38 aircraft  
 . X-21 aircraft  
 . X-21A aircraft
- RT ∞ aircraft
- Northwest Territories**
- GS nations  
 . Canada
- . . **Northwest Territories**
- Norton County achondrite**
- GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . achondrites  
 . . . . **Norton County achondrite**
- Norway**
- GS nations  
 . **Norway**
- RT Europe  
 fiords  
 Norwegian space program  
 Scandinavia
- Norwegian space program**  
*(added August 1990)*
- GS programs  
 . space programs  
 . . European space programs  
 . . . **Norwegian space program**
- RT Norway
- ∞ **nose**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT nose (anatomy)  
 noses (forebodies)
- nose (anatomy)**
- GS anatomy  
 . face (anatomy)  
 . . **nose (anatomy)**  
 . respiratory system  
 . . **nose (anatomy)**
- RT head (anatomy)  
 ∞ nose  
 paranasal sinuses  
 sinuses
- nose caps*  
 USE **nose cones**
- nose cones**
- DEF The cone shaped leading ends of rocket vehicles, consisting (a) of chambers in which satellites, instruments, animals, plants, or auxiliary equipment may be carried, and (b) of outer surfaces built to withstand high temperatures generated by aerodynamic heating. Used for nose caps.
- UF *nose caps*  
 GS cones  
 . **nose cones**  
 . . ablative nose cones  
 . . rocket nose cones  
 forebodies  
 . noses (forebodies)  
 . . **nose cones**  
 . . . ablative nose cones  
 . . . rocket nose cones
- RT ablative materials  
 aeroshells  
 blunt bodies
- ∞ caps  
 circular cones  
 half cones  
 missile components  
 ogives  
 reentry shielding  
 reentry vehicles  
 spacecraft components  
 spacecraft shielding  
 spherical caps  
 warheads
- nose fins**
- GS fins  
 . **nose fins**
- RT control surfaces  
 finned bodies  
 noses (forebodies)  
 vanes
- nose inlets**
- GS intake systems  
 . **nose inlets**
- RT air intakes

## nose tips

- annular ducts
- bypass ratio
- ducted bodies
- ducts
- hypersonic inlets
- inlet airframe configurations
- nacelles
- noses (forebodies)
- scoops
- side inlets
- supersonic inlets
- ∞ water intakes

### nose tips

DEF The foremost, sharp points of bombs, rockets, missiles, and other symmetrical bodies.

GS tips

- . **nose tips**

RT aerodynamic configurations  
airfoil profiles  
noses (forebodies)

### nose wheels

GS wheels

- . vehicle wheels
- . . . **nose wheels**

RT brakes (for arresting motion)  
landing gear

### noses (forebodies)

GS forebodies

- . **noses (forebodies)**
- . . . nose cones
- . . . ablative nose cones
- . . . rocket nose cones

RT aircraft structures

∞ nose

- nose fins
- nose inlets
- nose tips

### Nostoc

GS plants (botany)

- . algae
- . . blue green algae
- . . . **Nostoc**
- . thermophilic plants
- . . blue green algae
- . . . **Nostoc**

### notation

USE **coding**

### notch sensitivity

GS mechanical properties

- . toughness
- . . **notch sensitivity**
- sensitivity
- . **notch sensitivity**

RT Charpy impact test  
fatigue (materials)  
impact strength  
impact tests

### notch strength

GS mechanical properties

- . **notch strength**

RT brittleness  
ductility  
fatigue tests  
impact tests

∞ strength

- stress concentration
- stress intensity factors

### notch tests

UF *notched metals*

GS **notch tests**

- . Charpy impact test

RT brittleness  
crack opening displacement  
drop tests  
fatigue tests  
hardness  
impact tests  
stress concentration

∞ tests

### *notched metals*

USE **notch tests**

### notches

RT crack opening displacement  
passageways  
V grooves

### Nova computers

DEF A series of minicomputers built by Data General.

GS data processing equipment

- . computers
- . . digital computers
- . . . minicomputers
- . . . . **Nova computers**

### Nova Laser System

DEF Laser fusion system utilizing large neodymium glass lasers for irradiating DT pellets.

GS stimulated emission devices

- . lasers
- . . high power lasers
- . . . **Nova Laser System**

RT laser fusion  
laser outputs  
Shiva laser system

∞ systems

### Nova launch vehicles

GS launch vehicles

- . **Nova launch vehicles**
- rocket vehicles
- . multistage rocket vehicles
- . . **Nova launch vehicles**

RT F-1 rocket engine  
J-2 engine  
liquid propellant rocket engines  
M-1 engine

∞ vehicles

### Nova satellites

DEF A second generation Navy navigation satellite which replaces the transit satellites.

GS artificial satellites

- . navigation satellites
- . . **Nova satellites**

RT Discos (satellite attitude control)  
Transit navigation system

### Nova Scotia

GS nations

- . Canada
- . . **Nova Scotia**

### novae

GS celestial bodies

- . stars
- . . variable stars
- . . . **novae**
- . . . . dwarf novae
- . . . . Hercules nova

RT cataclysmic variables  
shock waves  
stellar mass  
stellar mass ejection  
supernovae  
symbiotic stars

### novocain

GS drugs

- . anesthetics
- . . **novocain**

### nowcasting

DEF A self contained short period meteorological forecast for the immediate future covering a period of up to six hours.

GS meteorology

- . weather forecasting
- . . **nowcasting**
- predictions
- . forecasting
- . . weather forecasting
- . . . **nowcasting**

RT aviation meteorology

hindcasting

### *noxious materials*

USE **contaminants**

### Nozomi Mars Orbiter

(added August 1998)

DEF A Japanese Mars mission spacecraft designed to study the Martian upper atmosphere and its interaction with the solar wind, and to develop technologies for use in future planetary missions. Specifically, instruments on the spacecraft enable the measurement of the structure, composition and dynamics of the ionosphere; aeronomy effects of the solar wind; the escape of atmospheric constituents; the intrinsic magnetic field; and dust in the upper atmosphere and in-orbit around Mars.

UF *Planet-B spacecraft*

GS interplanetary spacecraft

- . Mars probes
- . . **Nozomi Mars Orbiter**
- Japanese spacecraft
- . **Nozomi Mars Orbiter**
- unmanned spacecraft
- . space probes
- . . Mars probes
- . . . **Nozomi Mars Orbiter**

RT aeronomy  
Deimos  
Phobos  
planetary atmospheres  
solar planetary interactions

### *nozzle coefficient*

USE **nozzle flow**

### nozzle design

RT aerospace engines

∞ design

- engine design
- ∞ nozzles

### nozzle efficiency

DEF The efficiency with which a nozzle converts potential energy into kinetic energy, commonly expressed as the ratio of the actual change in kinetic energy to the ideal change at the given pressure ratio.

GS efficiency

- . **nozzle efficiency**

RT ∞ nozzles

- power efficiency
- propulsive efficiency
- thermodynamic efficiency

### nozzle flow

UF *nozzle coefficient*

GS fluid flow

- . internal flow
- . . **nozzle flow**

RT aerothermochemistry  
annular flow  
choked flow  
corner flow  
discharge coefficient  
exhaust gases  
exhaust nozzles  
fissionable materials  
flow geometry  
flow noise  
fluid injection  
injectors  
jet flow  
outlet flow  
pneumatic probes  
screech tones  
supersonic jet flow  
transonic flow

### nozzle geometry

GS geometry

- . **nozzle geometry**

RT coaxial nozzles  
conical nozzles  
convergent nozzles  
convergent-divergent nozzles  
discharge coefficient  
divergent nozzles  
mass flow factors



# nuclear devices

## . nuclear deformation

### nuclear devices

DEF Devices whose explosive potency is derived from nuclear fission of atoms of fissionable material with the consequent conversion of part of their mass into energy.

GS explosive devices

#### . nuclear devices

RT ∞ devices

fission weapons  
thermonuclear explosions  
warheads

### nuclear electric power generation

UF *nuclear power generation*

GS **nuclear electric power generation**

. nuclear auxiliary power units

. . SNAP

. . . fission electric cells

. . . . SNAP 2

. . . . SNAP 4

. . . . SNAP 8

. . . . SNAP 10A

. . . SNAP 1

. . . SNAP 3

. . . SNAP 7

. . . SNAP 9A

. . . SNAP 11

. . . SNAP 13

. . . SNAP 15

. . . SNAP 17

. . . SNAP 19

. . . SNAP 21

. . . SNAP 23

. . . SNAP 27

. . . SNAP 29

. . . SNAP 50

. . space power reactors

. . . fission electric cells

. . . . SNAP 2

. . . . SNAP 4

. . . . SNAP 8

. . . . SNAP 10A

. . . . SNAP 50

. . . space power unit reactors

. nuclear power plants

. . Enrico Fermi atomic power plant

. . Hallam Nuclear Power Facility

. . ML-1 nuclear power plant

. . nuclear power reactors

. . KIWI reactors

. . . KIWI B reactors

. . . . KIWI B-1 Reactor

. . . . KIWI B-4 Reactor

. . Pathfinder nuclear reactor

. . plutonium recycle test reactor

. . space power reactors

. . . fission electric cells

. . . . SNAP 2

. . . . SNAP 4

. . . . SNAP 8

. . . . SNAP 10A

. . . . SNAP 50

. . . space power unit reactors

. . Tory 2 reactor

. . Tory 2-A reactor

. . Tory 2-C reactor

. . thermonuclear power generation

RT electric generators

∞ nuclear energy

### nuclear electric propulsion

GS propulsion

. nuclear propulsion

. . **nuclear electric propulsion**

RT

electric propulsion

electrothermal engines

fusion propulsion

ion propulsion

marine propulsion

plasma propulsion

spacecraft propulsion

### nuclear emulsions

DEF Very thick photographic emulsions used in the study of cosmic rays and other energetic particles. The paths of the particles through the thick emulsions are recorded in three dimensions.

GS mixtures

. dispersions

. . emulsions

. . . photographic emulsions

. . . . **nuclear emulsions**

. . solutions

. . . photographic emulsions

. . . . **nuclear emulsions**

RT

dosimeters

radiation counters

radiation measuring instruments

## ∞ nuclear energy

SN

(USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF All forms of energy released in the course of a nuclear fission or a nuclear transformation.

UF *atomic energy*

RT annular core pulse reactors

atomic theory

chemical energy

energy policy

energy storage

molecular energy levels

nuclear chemistry

nuclear electric power generation

nuclear fission

nuclear fuels

nuclear fusion

nuclear heat

nuclear physics

nuclear propulsion

nuclear reactors

nuclear research

nuclear warfare

nuclear weapons

nucleonics

spent fuels

### nuclear engine for rocket vehicles

UF *NERVA (engine)*

GS engines

. rocket engines

. . **nuclear engine for rocket vehicles**

RT

booster rocket engines

KIWI reactors

NRX reactors

Phoebus nuclear reactor

Rover project

sustainer rocket engines

∞ vehicles

water cooled reactors

### nuclear explosion effect

RT ∞ effects

fallout

radiation effects

radiation hazards

### nuclear explosions

UF *atomic explosions*

GS explosions

. **nuclear explosions**

. . thermonuclear explosions

RT

aerial explosions

artificial radiation belts

civil defense

cratering

fallout

∞ fireballs

Fishbowl Operation

high energy interactions

radiation hazards

underground explosions

underwater explosions

Vela satellites

### nuclear fission

GS nuclear reactions

. **nuclear fission**

. . chain reactions (nuclear physics)

RT

critical experiments

critical mass

decay

fissile fuels

fission products

fusion reactors

fusion-fission hybrid reactors

high energy interactions

neutron flux density

∞ nuclear energy

radioactive decay

radioactive materials

subcritical mass

### nuclear fuel burnup

GS combustion

. fuel combustion

. . **nuclear fuel burnup**

RT

critical mass

reactor physics

reactor technology

### nuclear fuel elements

UF *fuel elements (nuclear reactors)*

RT annular core pulse reactors

∞ elements

fuels

plutonium alloys

reactor cores

reactor materials

uranium alloys

uranium carbides

### nuclear fuel reprocessing

DEF Periodic chemical, physical, and metallurgical treatment of materials used as fuel elements in nuclear reactors to recover and purify residual fissionable and fertile materials.

GS reclamation

. materials recovery

. . **nuclear fuel reprocessing**

RT

nuclear fuels

∞ processing

∞ recovery

recycling

spent fuels

### nuclear fuels

DEF Fissionable materials of reasonable long life, used or usable in producing energy in a nuclear reactor. Used for reactor fuels.

UF *reactor fuels*

GS fuels

. **nuclear fuels**

. . ceramic nuclear fuels

. . fissile fuels

. . fissionium

. . spent fuels

RT

annular core pulse reactors

deuterium

energy policy

fission

fissionable materials

fuel capsules

fuel production

inertial fusion (reactor)

mixed oxides

neutron sources

∞ nuclear energy

nuclear fuel reprocessing

pellets

plutonium

plutonium alloys

plutonium compounds

reactor cores

reactor materials

reactor startup tests

sol-gel processes

thorium

thorium alloys

thorium compounds

tritium

uranium

uranium 233

uranium 235

uranium 238

uranium alloys

uranium carbides

uranium compounds

uranium oxides

### nuclear fusion

UF *nucleosynthesis*

GS nuclear reactions

. thermonuclear reactions

. . **nuclear fusion**

. . . controlled fusion  
 RT collisional plasmas  
 degenerate matter  
 dense plasmas  
 deuterium irradiation  
 ∞ fusion  
 fusion propulsion  
 fusion reactors  
 fusion weapons  
 fusion-fission hybrid reactors  
 high energy interactions  
 irradiation  
 magnetic mirrors  
 mirror fusion  
 ∞ nuclear energy  
 plasma focus  
 railgun accelerators  
 star formation  
 stellar interiors  
 stellar physics  
 ∞ synthesis  
 tokamak devices  
  
**nuclear gyroscopes**  
 GS gyroscopes  
 . **nuclear gyroscopes**  
  
**nuclear heat**  
 GS heat  
 . **nuclear heat**  
 RT ∞ nuclear energy  
  
**nuclear interactions**  
 GS nuclear reactions  
 . **nuclear interactions**  
 . . nuclear capture  
 . . . electron capture  
 . . spin-orbit interactions  
 . . . electron capture  
 . . weak interactions (field theory)  
 particle interactions  
 . **nuclear interactions**  
 . . nuclear capture  
 . . . electron capture  
 . . spin-orbit interactions  
 . . . electron capture  
 . . weak interactions (field theory)  
 RT collision parameters  
 elementary particles  
 high energy interactions  
 ∞ interactions  
 strong interactions (field theory)  
  
**nuclear isobars**  
 RT chemical elements  
 ∞ isobars  
 isotopes  
 nuclei (nuclear physics)  
 nuclides  
  
**nuclear lightbulb engines**  
 GS engines  
 . rocket engines  
 . . nuclear rocket engines  
 . . . **nuclear lightbulb engines**  
 RT gaseous fission reactors  
  
**nuclear magnetic resonance**  
 UF *knight shift*  
*NMR*  
 GS resonance  
 . magnetic resonance  
 . . **nuclear magnetic resonance**  
 . . . proton magnetic resonance  
 . . . proton resonance  
 RT magnetic signals  
 magnetometers  
 molecular structure  
 paramagnetic resonance  
 particle spin  
 Planck's constant  
 spin resonance  
 spin-lattice relaxation  
  
**nuclear medicine**  
 DEF That branch of medicine dealing with the effect of radiation such as x rays, gamma rays, and energetic particles on the body and with the prevention and cure of physiological

injuries resulting from such radiation. Used for radiation medicine.  
 UF *radiation medicine*  
 GS medical science  
 . **nuclear medicine**  
 . . radiobiology  
 RT antiradiation drugs  
 health physics  
 ∞ radiation  
 radiopathology  
  
**nuclear meteorology**  
 GS meteorology  
 . **nuclear meteorology**  
 RT fallout  
  
**nuclear models**  
 GS models  
 . **nuclear models**  
 RT atomic structure  
 energy levels  
 molecular structure  
 quark parton model  
  
**nuclear particles**  
 GS particles  
 . **nuclear particles**  
 . . antiparticles  
 . . . antineutrinos  
 . . . antinucleons  
 . . . antiprotons  
 . . . positrons  
 . . beta particles  
 . . bosons  
 . . . alpha particles  
 . . . Higgs bosons  
 . . . mesons  
 . . . . eta-mesons  
 . . . . hyperons  
 . . . . xi hyperons  
 . . . . kaons  
 . . . . meson resonance  
 . . . . X mesons  
 . . . muons  
 . . . . omega-mesons  
 . . . pions  
 . . . . vector mesons  
 . . . . rho-mesons  
 . . . . . sigma-mesons  
 . . photons  
 . . . xi hyperons  
 . . nucleons  
 . . photoelectrons  
 RT corpuscular radiation  
 cosmic rays  
 elementary particles  
 fission products  
 gamma ray bursts  
 neutron cross sections  
 neutron distribution  
 neutron scattering  
 nuclear astrophysics  
 nucleon potential  
 nucleon-nucleon scattering  
 particle accelerators  
 particle tracks  
 photoneutrons  
 pi-electrons  
 positron annihilation  
 proton resonance  
 protons  
  
**nuclear physics**  
 GS **nuclear physics**  
 . nuclear astrophysics  
 . reactor physics  
 RT atomic structure  
 current algebra  
 electromagnetic absorption  
 field theory (physics)  
 health physics  
 ∞ nuclear energy  
 nucleonics  
 parity  
 particle spin  
 ∞ physics  
 quantum theory  
 ∞ science

theoretical physics  
  
**nuclear potential**  
 GS potential energy  
 . **nuclear potential**  
 RT nucleon potential  
  
*nuclear power generation*  
 USE **nuclear electric power generation**  
  
**nuclear power plants**  
 GS electric power plants  
 . **nuclear power plants**  
 . . Enrico Fermi atomic power plant  
 . . Hallam Nuclear Power Facility  
 . . ML-1 nuclear power plant  
 nuclear electric power generation  
 . **nuclear power plants**  
 . . Enrico Fermi atomic power plant  
 . . Hallam Nuclear Power Facility  
 . . ML-1 nuclear power plant  
 RT plasma core reactors  
  
**nuclear power reactors**  
 GS nuclear electric power generation  
 . **nuclear power reactors**  
 . . KIWI reactors  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . . Pathfinder nuclear reactor  
 . . plutonium recycle test reactor  
 . . space power reactors  
 . . . fission electric cells  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 . . . SNAP 50  
 . . . space power unit reactors  
 . . Tory 2 reactor  
 . . Tory 2-A reactor  
 . . Tory 2-C reactor  
 nuclear reactors  
 . **nuclear power reactors**  
 . . KIWI reactors  
 . . . KIWI B reactors  
 . . . . KIWI B-1 Reactor  
 . . . . KIWI B-4 Reactor  
 . . Pathfinder nuclear reactor  
 . . plutonium recycle test reactor  
 . . space power reactors  
 . . . fission electric cells  
 . . . . SNAP 2  
 . . . . SNAP 4  
 . . . . SNAP 8  
 . . . . SNAP 10A  
 . . . SNAP 50  
 . . . space power unit reactors  
 . . Tory 2 reactor  
 . . Tory 2-A reactor  
 . . Tory 2-C reactor  
 RT boiling water reactors  
 breeder reactors  
 fast nuclear reactors  
 fast oxide reactors  
 high temperature gas cooled reactors  
 liquid metal fast breeder reactors  
 power reactors  
 pressurized water reactors  
 SNAP  
 sodium graphite reactors  
  
**nuclear powered ships**  
 GS surface vehicles  
 . **nuclear powered ships**  
 . . Savannah nuclear ship  
 water vehicles  
 . ships  
 . . **nuclear powered ships**  
 . . . Savannah nuclear ship  
 RT aircraft carriers  
 cargo ships  
 navy  
 submarines  
  
**nuclear propelled aircraft**  
 RT ∞ aircraft  
 ∞ military aircraft

## nuclear propulsion

research aircraft

### nuclear propulsion

UF *chemonuclear propulsion*  
*thermonuclear propulsion*

GS propulsion

. **nuclear propulsion**

. . fusion propulsion

. . nuclear electric propulsion

RT aircraft engines

gaseous fission reactors

high temperature nuclear reactors

high temperature propellants

magnetic nozzles

marine propulsion

matter-antimatter propulsion

mercury ion engines

NEW MOONS project

∞ nuclear energy

Rover project

Savannah nuclear ship

spacecraft propulsion

trident submarine

underwater propulsion

### nuclear pumped lasers

DEF Lasers in which the excitation is supplied by a nuclear reactor as a high flux source or by the kinetic energy of the fission fragments only.

GS stimulated emission devices

. lasers

. . **nuclear pumped lasers**

RT optical pumping

optical resonance

### nuclear pumping

DEF Laser-like pumping produced by electrons generated in nuclear reactions or, in general, by beams of charged particles.

RT electron pumping

energy transfer

fission products

gas lasers

lasers

optical pumping

population inversion

∞ pumping

stimulated emission

stimulated emission devices

### nuclear quadrupole resonance

GS resonance

. **nuclear quadrupole resonance**

RT energy levels

quadrupoles

### nuclear radiation

DEF Corpuscular emissions, such as alpha and beta particles, or electromagnetic radiation, such as gamma rays, originating in the nucleus of the atom.

GS **nuclear radiation**

. beta particles

. fast neutrons

. gamma ray beams

. gamma rays

. . gamma ray bursts

. neutron beams

. photoneutrons

. post-blast nuclear radiation

. spallation

. thermal neutrons

RT alpha particles

bremsstrahlung

Cerenkov radiation

corpuscular radiation

electromagnetic radiation

electron pumping

electron radiation

electrons

elementary particles

emission spectra

fission products

gamma ray absorption

health physics

high energy interactions

ionizing radiation

irradiation

neutrons

particle production

photons

∞ radiation

radiation effects

radiation hazards

radioactive contaminants

radioactive decay

radioactive materials

radioactivity

radiobiology

radiochemistry

Vela satellites

### nuclear radiation spectroscopy

GS spectroscopy

. **nuclear radiation spectroscopy**

RT mass spectroscopy

spectroscopic analysis

vacuum spectroscopy

### nuclear ramjet engines

GS engines

. rocket engines

. . **nuclear ramjet engines**

RT Pluto reactors

∞ rockets

supersonic low altitude missile

### nuclear reactions

UF *neutron transmutation*

GS **nuclear reactions**

. nuclear fission

. . chain reactions (nuclear physics)

. nuclear interactions

. . nuclear capture

. . . electron capture

. . . spin-orbit interactions

. . . electron capture

. . weak interactions (field theory)

. nuclear scattering

. . neutron scattering

. . resonance scattering

. nuclear transformations

. . transmutation

. photonuclear reactions

. proton scattering

. proton-proton reactions

. radioactive decay

. . alpha decay

. . neutron emission

. spallation

. thermonuclear reactions

. . nuclear fusion

. . . controlled fusion

RT Bragg curve

Compton effect

critical experiments

critical mass

electron scattering

emission

half life

high energy interactions

inhour equation

∞ interactions

internal conversion

pair production

particle interactions

particle production

photoneutrons

poisoning (reaction inhibition)

pomerons

radiation absorption

radiogenic materials

∞ reaction

reaction kinetics

reactivity

solar neutrinos

strong interactions (field theory)

subcritical mass

### nuclear reactor control

RT confinement

∞ control

control rods

∞ reaction control

reactor safety

### nuclear reactors

DEF Apparatus in which nuclear fission may

be sustained in a self supporting chain reaction.

GS **nuclear reactors**

. annular core pulse reactors

. Astron thermonuclear reactor

. breeder reactors

. . Experimental Breeder Reactor 1

. . Experimental Breeder Reactor 2

. . light water breeder reactors

. . liquid metal fast breeder reactors

. engineering test reactors

. fast nuclear reactors

. . Experimental Breeder Reactor 1

. . Experimental Breeder Reactor 2

. . fast oxide reactors

. . fast test reactors

. . gas cooled fast reactors

. . liquid metal fast breeder reactors

. fusion reactors

. . heliotrons

. . spheromaks

. . stellarators

. fusion-fission hybrid reactors

. gas cooled reactors

. . experimental gas cooled reactors

. . gas cooled fast reactors

. . high temperature nuclear reactors

. . . high temperature gas cooled

reactors

. . KIWI reactors

. . . KIWI B reactors

. . . . KIWI B-1 Reactor

. . . . KIWI B-4 Reactor

. . Tory 2 reactor

. . Tory 2-A reactor

. . Tory 2-C reactor

. gaseous fission reactors

. Hanford reactors

. high flux isotope reactors

. liquid cooled reactors

. . liquid metal cooled reactors

. . . advanced sodium cooled reactor

. . . Experimental Breeder Reactor 1

. . . Experimental Breeder Reactor 2

. . . Lithium Cooled Reactor

Experiment

. . . Los Alamos Molten Plutonium

Reactor

. . . military compact reactors

. . . sodium graphite reactors

. . . sodium reactor experiment

. . organic cooled reactors

. . . experimental organic cooled

reactors

. . water cooled reactors

. . . boiling water reactors

. . . . experimental boiling water

reactors

. . . . Halden Boiling Water Reactor

. . . . Los Alamos Water Boiler

Reactor

. . . . Pathfinder nuclear reactor

. . . . Spert reactors

. . . heavy water reactors

. . . . heavy water components test

reactors

. . . . plutonium recycle test reactor

. . . . zero power reactor 2

. . . light water reactors

. . . NRX reactors

. . . Plum Brook Reactor

. . . pressurized water reactors

. . . . spectral shift control reactor

. . . swimming pool reactors

. . . zero power reactors

. . . . zero power reactor 2

. . . . zero power reactor 3

. . . . zero power reactor 6

. . . . zero power reactor 9

. molten salt nuclear reactors

. nuclear power reactors

. . KIWI reactors

. . . KIWI B reactors

. . . . KIWI B-1 Reactor

. . . . KIWI B-4 Reactor

. . Pathfinder nuclear reactor

. . plutonium recycle test reactor

. . space power reactors

. . . fission electric cells

. . . . SNAP 2

- . . . . SNAP 4
- . . . . SNAP 8
- . . . . SNAP 10A
- . . . . SNAP 50
- . . . space power unit reactors
- . . . Tory 2 reactor
- . . . Tory 2-A reactor
- . . . Tory 2-C reactor
- . . nuclear research and test reactors
- . . . advanced test reactors
- . . . experimental boiling water reactors
- . . . Experimental Breeder Reactor 1
- . . . Experimental Breeder Reactor 2
- . . . experimental gas cooled reactors
- . . . experimental organic cooled reactors
- . . . Health Physics Research Reactor
- . . . heavy water components test reactors
- . . . HERO Reactor
- . . . high temperature nuclear reactors
- . . . high temperature gas cooled reactors
- . . . Janus Reactor
- . . . KIWI reactors
- . . . . KIWI B reactors
- . . . . . KIWI B-1 Reactor
- . . . . . KIWI B-4 Reactor
- . . . Livermore Pool Type Reactor
- . . . Los Alamos Molten Plutonium Reactor
- . . . military compact reactors
- . . . NRX reactors
- . . . Plum Brook Reactor
- . . . plutonium recycle test reactor
- . . . sodium reactor experiment
- . . . Spert reactors
- . . . Tory 2 reactor
- . . . Tory 2-A reactor
- . . . Tory 2-C reactor
- . . . Tower Shielding Reactor 2
- . . . zero power reactor 2
- . . . zero power reactor 3
- . . . zero power reactor 6
- . . . zero power reactor 9
- . . . organic moderated reactors
- . . . experimental organic cooled reactors
- . . . pebble bed reactors
- . . . Phoebus nuclear reactor
- . . . plasma core reactors
- . . . Pluto reactors
- . . . thermal reactors
- . . . tokamak devices
- . . . . Joint European Torus
- . . . water moderated reactors
- . . . experimental boiling water reactors
- . . . heavy water components test reactors
- . . . plutonium recycle test reactor
- RT closed cycles
- control rods
- coolants
- fissile fuels
- high flux beam reactors
- inhour equation
- loss of coolant
- moderators
- ∞ nuclear energy
- ∞ piles
- radiation shielding
- reactor cores
- reactor design
- reactor materials
- reactor physics
- reactor safety
- reactor startup tests
- reactor technology
- ∞ reactors
- Rover project
- thermal neutrons
- thermal pollution
- nuclear relaxation**
- RT relaxation (mechanics)
- nuclear research**
- GS research
- . . **nuclear research**
- RT high energy interactions
- laboratories
- ∞ nuclear energy
- plasma core reactors
- radiochemistry
- nuclear research and test reactors**
- DEF A class of nuclear reactors used to do research into nuclear physics, reactor materials and design, and nuclear medicine.
- UF *materials testing reactors*
- nuclear test reactors*
- physical constants testing reactor*
- GS nuclear reactors
- . **nuclear research and test reactors**
- . . advanced test reactors
- . . experimental boiling water reactors
- . . . Experimental Breeder Reactor 1
- . . . Experimental Breeder Reactor 2
- . . . experimental gas cooled reactors
- . . . experimental organic cooled reactors
- . . . Health Physics Research Reactor
- . . . heavy water components test reactors
- . . . HERO Reactor
- . . . high temperature nuclear reactors
- . . . high temperature gas cooled reactors
- . . . Janus Reactor
- . . . KIWI reactors
- . . . . KIWI B reactors
- . . . . . KIWI B-1 Reactor
- . . . . . KIWI B-4 Reactor
- . . . Livermore Pool Type Reactor
- . . . Los Alamos Molten Plutonium Reactor
- . . . military compact reactors
- . . . NRX reactors
- . . . Plum Brook Reactor
- . . . plutonium recycle test reactor
- . . . sodium reactor experiment
- . . . Spert reactors
- . . . Tory 2 reactor
- . . . Tory 2-A reactor
- . . . Tory 2-C reactor
- . . . Tower Shielding Reactor 2
- . . . zero power reactor 2
- . . . zero power reactor 3
- . . . zero power reactor 6
- . . . zero power reactor 9
- RT boiling water reactors
- neutron sources
- reactor design
- reactor technology
- ∞ reactors
- Transient Reactor Test Facility
- nuclear rocket engines**
- DEF Rocket engines in which nuclear reactors are used as power sources or as sources of thermal energy. Used for thermionic reactors.
- UF *thermionic reactors*
- GS engines
- . . rocket engines
- . . . **nuclear rocket engines**
- . . . . nuclear lightbulb engines
- RT booster rocket engines
- fusion propulsion
- ion engines
- magnetic nozzles
- mercury ion engines
- Phoebus nuclear reactor
- Pluto reactors
- restartable rocket engines
- ∞ rockets
- sustainer rocket engines
- nuclear scattering**
- SN (SCATTERING CAUSED BY NUCLEUS AND NOT BY ORBITAL ELECTRONS)
- GS nuclear reactions
- . **nuclear scattering**
- . . neutron scattering
- . . resonance scattering
- scattering
- . **nuclear scattering**
- . . neutron scattering
- . . resonance scattering
- RT angular distribution
- backscattering
- coherent scattering
- elastic scattering
- electron scattering
- forward scattering
- incoherent scattering
- inelastic scattering
- Mandelstam representation
- nuclear shielding*
- USE **radiation shielding**
- nuclear spin**
- GS spin
- . . particle spin
- . . . **nuclear spin**
- RT electron spin
- energy levels
- Kondo effect
- magnetic resonance
- Overhauser effect
- quantum numbers
- quantum theory
- yrast state
- nuclear structure**
- RT energy levels
- even-even nuclei
- odd-odd nuclei
- nuclear test reactors*
- USE **nuclear research and test reactors**
- nuclear transformations**
- GS nuclear reactions
- . **nuclear transformations**
- . . transmutation
- nuclear vulnerability**
- DEF The resistance of structures or materials to nuclear radiation or explosions.
- GS vulnerability
- . **nuclear vulnerability**
- RT penetration
- radiation effects
- thermonuclear explosions
- nuclear warfare**
- GS warfare
- . **nuclear warfare**
- RT civil defense
- hardening (systems)
- ∞ nuclear energy
- nuclear warheads**
- GS weapons
- . warheads
- . . **nuclear warheads**
- nuclear wastes*
- USE **radioactive wastes**
- nuclear weapons**
- GS weapons
- . **nuclear weapons**
- . . fission weapons
- . . fusion weapons
- RT bombs (ordnance)
- explosives
- missiles
- ∞ nuclear energy
- projectiles
- ∞ rockets
- space weapons
- torpedoes
- warheads
- weapon systems
- weapons delivery
- nuclease**
- GS biopolymers
- . proteins
- . . enzymes
- . . . **nuclease**
- organic compounds
- . proteins
- . . enzymes



## nucleate boiling

... nuclease

**nucleate boiling**  
GS phase transformations  
. vaporizing  
. boiling  
... **nucleate boiling**  
... Leidenfrost phenomenon  
RT film boiling  
heat transfer  
heat transfer coefficients  
nucleation

**nucleation**  
GS **nucleation**  
. cloud seeding  
RT accumulations  
Aitken nuclei  
atomic clusters  
condensation nuclei  
condensing  
crystal growth  
crystallization  
drop size  
∞ formation  
grain formation  
heat treatment  
ice nuclei  
initiation  
inoculation  
jet condensers  
metal clusters  
molecular clusters  
nucleate boiling  
∞ nuclei  
recrystallization  
supercooling

∞ **nuclei**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT active galactic nuclei  
Aitken nuclei  
charged particles  
chromosomes  
condensation nuclei  
ice nuclei  
nucleation  
nuclei (cytology)  
nuclei (nuclear physics)  
nucleogenesis  
odd-odd nuclei

**nuclei (cytology)**  
GS organelles  
. **nuclei (cytology)**  
RT cells (biology)  
cytology  
cytoplasm  
genetics  
∞ nuclei

**nuclei (nuclear physics)**  
DEF The positively charged cores of atoms with which are associated practically the whole mass of each atom but only a minute part of its volume.  
GS particles  
. charged particles  
. energetic particles  
... **nuclei (nuclear physics)**  
... alpha particles  
... deuterons  
... even-even nuclei  
... heavy nuclei  
... hypernuclei  
... odd-even nuclei  
... odd-odd nuclei  
... tritons  
. corpuscular radiation  
. energetic particles  
... **nuclei (nuclear physics)**  
... alpha particles  
... deuterons  
... even-even nuclei  
... heavy nuclei  
... hypernuclei  
... odd-even nuclei  
... odd-odd nuclei

... tritons  
RT atoms  
corpuscular radiation  
cosmic rays  
elementary particles  
ions  
isotopes  
neutrons  
nuclear isobars  
∞ nuclei  
nucleons  
∞ physics  
protons  
yrast state

*nucleic acid denaturation*  
USE **biopolymer denaturation**

**nucleic acids**  
GS acids  
. **nucleic acids**  
. . . deoxyribonucleic acid  
. . . complementary DNA  
. . . ribonucleic acids  
biopolymers  
. **nucleic acids**  
. . . deoxyribonucleic acid  
. . . complementary DNA  
. . . ribonucleic acids  
organic compounds  
. **nucleic acids**  
. . . deoxyribonucleic acid  
. . . complementary DNA  
. . . ribonucleic acids  
RT biopolymer denaturation  
guanosines  
proteins  
uridylic acid

**nucleogenesis**  
RT genetics  
mutations  
∞ nuclei

**nucleon potential**  
RT neutrons  
nuclear particles  
nuclear potential  
∞ potential  
protons  
∞ radiation

**nucleonics**  
RT ∞ electronics  
∞ nuclear energy  
nuclear physics  
technologies

**nucleon-nucleon interactions**  
GS particle interactions  
. elementary particle interactions  
. . **nucleon-nucleon interactions**  
RT charged particles  
∞ interactions

**nucleon-nucleon scattering**  
GS scattering  
. **nucleon-nucleon scattering**  
RT nuclear particles  
particle collisions  
Pomeranchuk theorem

**nucleons**  
DEF In the classification of subatomic particles according to mass, the second heaviest type of particles; their mass is intermediate between that of the meson and the hyperon.  
GS particles  
. elementary particles  
. . **nucleons**  
. nuclear particles  
. . **nucleons**  
RT alpha particles  
antinucleons  
baryons  
charged particles  
fast neutrons  
hyperons  
neutrons  
nuclei (nuclear physics)

protons  
vector dominance model

**nucleophiles**  
GS electron attachment  
. **nucleophiles**

**nucleosides**  
GS organic compounds  
. carbohydrates  
. . glucosides  
... **nucleosides**  
... adenines  
... guanosines  
RT ribose  
thymidine

*nucleosynthesis*  
USE **nuclear fusion**

**nucleotides**  
GS organic compounds  
. **nucleotides**  
. . adenines  
. . adenosines  
. . . adenosine diphosphate  
. . . adenosine monophosphate  
. . . adenosine triphosphate  
. . . cyclic AMP  
. . . oligonucleotides  
. . polynucleotides  
. . pyridine nucleotides  
. . uridylic acid  
RT biopolymers  
proteins

**nuclides**  
DEF Individual atoms of a given atomic number Z and mass number A.  
GS chemical elements  
. **nuclides**  
. . isotopes  
. . . aluminum isotopes  
. . . . aluminum 26  
. . . . aluminum 27  
. . . antimony isotopes  
. . . argon isotopes  
. . . arsenic isotopes  
. . . barium isotopes  
. . . beryllium isotopes  
. . . . beryllium 7  
. . . . beryllium 9  
. . . . beryllium 10  
. . . bismuth isotopes  
. . . boron isotopes  
. . . . boron 10  
. . . bromine isotopes  
. . . cadmium isotopes  
. . . calcium isotopes  
. . . carbon isotopes  
. . . . carbon 12  
. . . . carbon 13  
. . . . carbon 14  
. . . cerium isotopes  
. . . . cerium 137  
. . . . cerium 144  
. . . cesium isotopes  
. . . . cesium 133  
. . . . cesium 134  
. . . . cesium 137  
. . . . cesium 144  
. . . cesium vapor  
. . . chromium isotopes  
. . . cobalt isotopes  
. . . . cobalt 58  
. . . . cobalt 60  
. . . dysprosium isotopes  
. . . erbium isotopes  
. . . europium isotopes  
. . . fluorine isotopes  
. . . gadolinium isotopes  
. . . gallium isotopes  
. . . germanium isotopes  
. . . gold isotopes  
. . . . gold 198  
. . . hafnium isotopes  
. . . helium isotopes  
. . . holmium isotopes  
. . . hydrogen isotopes  
. . . . deuterium

- ... hydrogen 4
- ... metallic hydrogen
- ... tritium
- ... iodine isotopes
- ... iodine 125
- ... iodine 131
- ... iodine 132
- ... iridium isotopes
- ... iron isotopes
- ... iron 57
- ... iron 58
- ... iron 59
- ... krypton isotopes
- ... krypton 85
- ... lanthanum isotopes
- ... lead isotopes
- ... lithium isotopes
- ... lutetium
- ... lutetium isotopes
- ... magnesium isotopes
- ... manganese isotopes
- ... mercury isotopes
- ... molybdenum isotopes
- ... neodymium isotopes
- ... neon isotopes
- ... nickel isotopes
- ... niobium isotopes
- ... niobium 95
- ... nitrogen isotopes
- ... nitrogen 15
- ... nitrogen 16
- ... nobelium isotopes
- ... osmium isotopes
- ... oxygen isotopes
- ... oxygen 17
- ... oxygen 18
- ... palladium isotopes
- ... phosphorus isotopes
- ... phosphorus 32
- ... platinum isotopes
- ... polonium isotopes
- ... polonium 208
- ... polonium 209
- ... polonium 210
- ... potassium isotopes
- ... potassium 38
- ... potassium 39
- ... potassium 40
- ... praseodymium isotopes
- ... promethium isotopes
- ... protactinium isotopes
- ... radioactive isotopes
- ... astatine isotopes
- ... beryllium 7
- ... beryllium 9
- ... beryllium 10
- ... carbon 14
- ... cerium 137
- ... cerium 144
- ... cesium 134
- ... cesium 137
- ... cesium 144
- ... cobalt 58
- ... cobalt 60
- ... copper isotopes
- ... gold 198
- ... indium isotopes
- ... iodine 125
- ... iodine 131
- ... iodine 132
- ... iron 59
- ... krypton 85
- ... niobium 95
- ... nitrogen 16
- ... phosphorus 32
- ... polonium 208
- ... polonium 209
- ... polonium 210
- ... potassium 38
- ... potassium 40
- ... rubidium 86
- ... sodium 22
- ... sodium 24
- ... strontium 85
- ... strontium 88
- ... strontium 89
- ... strontium 90
- ... transuranium elements
- ... americium

- ... americium isotopes
- ... americium 241
- ... berkelium
- ... californium
- ... californium isotopes
- ... curium
- ... curium isotopes
- ... curium 242
- ... curium 244
- ... einsteinium
- ... fermium
- ... lawrencium
- ... mendelevium
- ... neptunium
- ... neptunium isotopes
- ... nobelium
- ... plutonium
- ... plutonium isotopes
- ... plutonium 238
- ... plutonium 239
- ... plutonium 240
- ... plutonium 241
- ... plutonium 244
- ... sergenium
- ... tritium
- ... uranium 232
- ... uranium 233
- ... uranium 238
- ... xenon 133
- ... xenon 135
- ... zirconium 95
- ... radium isotopes
- ... radium 226
- ... radon isotopes
- ... rhenium isotopes
- ... rhodium isotopes
- ... rubidium isotopes
- ... rubidium 86
- ... ruthenium isotopes
- ... samarium isotopes
- ... scandium isotopes
- ... selenium isotopes
- ... silicon isotopes
- ... silver isotopes
- ... sodium isotopes
- ... sodium 22
- ... sodium 24
- ... strontium isotopes
- ... strontium 85
- ... strontium 87
- ... strontium 89
- ... strontium 90
- ... sulfur isotopes
- ... tantalum isotopes
- ... technetium isotopes
- ... tellurium
- ... tellurium isotopes
- ... terbium isotopes
- ... thallium isotopes
- ... thorium isotopes
- ... thulium isotopes
- ... tin isotopes
- ... titanium isotopes
- ... tungsten isotopes
- ... uranium isotopes
- ... uranium 232
- ... uranium 233
- ... uranium 234
- ... uranium 235
- ... uranium 238
- ... vanadium isotopes
- ... xenon isotopes
- ... xenon 129
- ... xenon 133
- ... xenon 135
- ... ytterbium isotopes
- ... yttrium isotopes
- ... zinc isotopes
- ... zirconium isotopes
- ... zirconium 95

RT isotopic enrichment  
nuclear isobars  
particle mass

**null hypothesis**

- GS hypotheses
- ... **null hypothesis**
- RT confidence limits
- degrees of freedom

- significance
- statistical tests

**null zones**

- GS regions
- ... **null zones**
- RT diffraction patterns
- field theory (physics)
- ∞ force
- interferometry
- radiation distribution
- speckle interferometry
- very long base interferometry

**number theory**

- GS **number theory**
- ... addition theorem
- ... arithmetic
- ... double precision arithmetic
- ... fixed point arithmetic
- ... floating point arithmetic
- ... congruences
- ... diophantine equation
- ... dividing (mathematics)
- ... exponents
- ... induction (mathematics)
- ... integers
- ... multiplication
- ... subtraction
- RT addition
- combinatorial analysis
- decimals
- digits
- ∞ division
- enumeration
- Fibonacci numbers
- functions (mathematics)
- ∞ induction
- infinity
- ∞ mathematics
- ∞ numbers
- quaternions
- subgroups
- ∞ theories
- uniqueness theorem

∞ **numbers**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT alphanumeric characters
- Biot number
- complex numbers
- coordination number
- counting
- Damkohler number
- decimals
- digits
- dimensionless numbers
- double precision arithmetic
- Fibonacci numbers
- integers
- number theory
- quantum numbers
- random numbers
- real numbers

**numerical analysis**

DEF Study of approximation methods using arithmetic techniques for the solution of mathematical problems.

- GS analysis (mathematics)
- ... **numerical analysis**
- ... approximation
- ... Born approximation
- ... Born-Oppenheimer approximation
- ... Chebyshev approximation
- ... Eddington approximation
- ... essentially non-oscillatory schemes
- ... finite difference theory
- ... finite difference time domain method
- ... finite element method
- ... Hartree approximation
- ... least squares method
- ... mean square values
- ... Milne method
- ... multigrid methods
- ... Newton methods

## numerical aperture

- . . . . Newton-Raphson method
- . . . boundary element method
- . . . discretization (mathematics)
- . . . numerical differentiation
- . . . Oseen approximation
- . . . Pade approximation
- . . . particle in cell technique
- . . . Pohlhausen method
- . . . predictor-corrector methods
- . . . Rayleigh-Ritz method
- . . . relaxation method (mathematics)
- . . . Reynolds averaging
- . . . Ritz averaging method
- . . . Schwartz method
- . . . Sommerfeld approximation
- . . . TVD schemes
- . . . upwind schemes (mathematics)
- . . . vortex in cell technique
- . . . Trefftz method
- . . . computational mechanics
- . . . meshfree methods
- . . . boundary integral method
- . . . computational astrophysics
- . . . computational chemistry
- . . . computational electromagnetics
- . . . computational fluid dynamics
- . . . difference equations
- . . . error analysis
- . . . finite volume method
- . . . Godunov method
- . . . flux difference splitting
- . . . flux vector splitting
- . . . Glimm method
- . . . Graeff calculus
- . . . interpolation
- . . . iteration
- . . . conjugate gradient method
- . . . iterative solution
- . . . Newton methods
- . . . Newton-Raphson method
- . . . predictor-corrector methods
- . . . Monte Carlo method
- . . . nomographs
- . . . numerical integration
- . . . Runge-Kutta method
- . . . computational aeroacoustics
- . . . direct numerical simulation
- . . . space-time CE/SE method
- . . . truncation errors
- RT adjoints
- algorithms
- alternating direction implicit methods
- ∞ analyzing
- ∞ applications of mathematics
- asymptotes
- computational grids
- computer programming
- Crank-Nicholson method
- differential equations
- ill-conditioned problems (mathematics)
- ill-posed problems (mathematics)
- isoparametric finite elements
- linear programming
- mathematical tables
- ∞ mathematics
- method of moments
- significance
- spatial marching
- time marching
- trajectory analysis

### numerical aperture

(added January 1995)

DEF The sine of the vertex angle of the largest cone of meridional rays that can enter or leave an optical system or element, multiplied by the refractive index of the medium in which the vertex of the cone is located. Generally measured with respect to an object or image point, and will vary as that point is moved.

- GS openings
  - . apertures
  - . . . **numerical aperture**
- RT fiber optics
- geometrical optics
- lenses
- optical coupling
- optical fibers

- optical properties
- resolution

### numerical control

- UF *computerized control*
- GS automatic control
  - . **numerical control**
- RT ∞ automation
  - ∞ control
  - computer programs
  - control systems design
  - digital command systems
  - digital techniques
  - electric control
  - interactive control
  - machine tools
  - production engineering
  - sequential control
  - standardization

### numerical data bases

- GS data bases
  - . **numerical data bases**
- RT information retrieval
- on-line systems

### numerical differentiation

- DEF Approximate estimation of a derivative of a function by numerical techniques.
- GS analysis (mathematics)
  - . numerical analysis
  - . . approximation
  - . . . **numerical differentiation**
  - . . . real variables
  - . . **numerical differentiation**
- RT algorithms
  - computer techniques
  - differential calculus
  - differential equations
  - estimating
  - functions (mathematics)
- ∞ theories

### numerical flow visualization

- GS flow visualization
  - . **numerical flow visualization**
  - information analysis
  - . scientific visualization
  - . . **numerical flow visualization**
- RT computational fluid dynamics
- computerized simulation
- flow distribution
- hydraulic analogies

### numerical integration

- UF *Cowell method*
- GS analysis (mathematics)
  - . numerical analysis
  - . . **numerical integration**
  - . . . Runge-Kutta method
  - . . . real variables
  - . . . measure and integration
  - . . . **numerical integration**
  - . . . . Runge-Kutta method
- RT differential equations
- digital integrators
- integral calculus

### numerical stability

- GS stability
  - . **numerical stability**
- RT approximation
- backward differencing
- difference equations
- differential equations
- ill-conditioned problems (mathematics)
- ill-posed problems (mathematics)
- strange attractors

### numerical weather forecasting

- GS meteorology
  - . weather forecasting
  - . . **numerical weather forecasting**
  - predictions
  - . forecasting
  - . . weather forecasting
  - . . . **numerical weather forecasting**
- RT Atmospheric General Circulation
- Models

- atmospheric models
- aviation meteorology
- computerized simulation
- long range weather forecasting
- mathematical models
- statistical weather forecasting

### nunataks

- GS landforms
  - . islands
  - . . **nunataks**
- RT Arctic regions
- rocks
- sea ice

### Nusselt number

DEF A number expressing the ratio of convective to conductive heat transfer between a solid boundary and a moving fluid, defined as  $h/k$  where  $h$  is the heat transfer coefficient,  $l$  is the characteristic length, and  $k$  is the thermal conductivity of the fluid. (Named after Wilhelm Nusselt, German engineer.)

- GS dimensionless numbers
  - . **Nusselt number**
  - ratios
  - . **Nusselt number**
- RT Brinkman number
- convective heat transfer
- heat transfer
- Prandtl number
- Schmidt number

### nutaton

DEF The oscillation of the axis of any rotating body, as a gyroscope rotor. Specifically, in astronomy, irregularities in the precessional motion of the equinoxes because of varying positions of the moon and, to a lesser extent, of other celestial bodies with respect to the ecliptic. Used for nutational oscillation.

- UF *nutational oscillation*
- GS **nutaton**
  - . Chandler wobble
- RT actuation
- coning motion
- displacement
- ∞ dynamics
- Earth orientation
- kinematics
- libration
- librational motion
- ∞ motion
- perturbation
- polar wandering (geology)
- precession
- rotation
- vibration

### nutaton dampers

- RT control moment gyroscopes
- ∞ dampers
- oscillation dampers
- spacecraft stability

### nutational oscillation

USE **nutaton**

### ∞ nutrients

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aquaculture
- caloric requirements
- carbohydrates
- eutrophication
- fats
- fatty acids
- fishes
- life support systems
- lipid metabolism
- lipids
- minerals
- nutrition
- nutritional requirements
- proteins
- trace elements
- vitamins

### nutrition

- RT biochemistry

- broths
- caloric requirements
- diets
- ∞ food
- metabolism
- nitrogen metabolism
- ∞ nutrients
- nutritional requirements
- space flight feeding

**nutritional requirements**

- GS **nutritional requirements**
  - . caloric requirements
- RT atrophy
- ∞ nutrients
- nutrition
- space flight feeding
- synthetic food

**nuts (fasteners)**

- GS fasteners
  - . **nuts (fasteners)**
- RT anchors (fasteners)
  - bolts
  - holders
  - screws

threads

**nuts (fruits)**

- RT angiosperms
  - orchards
  - seeds

**Nylon (trademark)**

- GS fibers
  - . synthetic fibers
  - . . **Nylon (trademark)**
- plastics
  - . synthetic resins
  - . . thermosetting resins
  - . . . furan resins
  - . . . . polyamide resins
  - . . . . . **Nylon (trademark)**
- resins
  - . synthetic resins
  - . . thermosetting resins
  - . . . furan resins
  - . . . . polyamide resins
  - . . . . . **Nylon (trademark)**
- RT polymeric films

∞ polymers

*nylon resins*

- USE **polyamide resins**

**Nyquist diagram**

- GS diagrams
  - . **Nyquist diagram**
- RT control stability
  - transfer functions

**Nyquist frequencies**

- GS frequencies
  - . **Nyquist frequencies**
- RT linear receivers

**nystagmus**

- DEF An involuntary oscillation of the eye-balls, especially occurring as a result of eye fixations and stimulations of the inner ear during rotation of the body.
- GS eye movements
  - . **nystagmus**
  - . . vestibular nystagmus
- RT electronystagmography
  - eye (anatomy)

# O

## O ring seals

- GS seals (stoppers)
  - . **O ring seals**
- RT gaskets
  - glands (seals)
  - hermetic seals
  - labyrinth seals
  - ∞ rings
  - Space Shuttle Boosters

## O stars

- GS celestial bodies
  - . stars
  - . . . early stars
  - . . . hot stars
  - . . . . **O stars**
- RT blue stars
  - Population I stars
  - Wolf-Rayet stars

## Oak Ridge isochronous cyclotron

- UF *ORIC cyclotron*
- GS particle accelerators
  - . cyclotrons
  - . . **Oak Ridge isochronous cyclotron**

## OAO

- UF *Orbiting Astronomical Observatory S-18 satellite*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . **OAO**
  - . . . . OAO 1
  - . . . . OAO 2
  - . . . . OAO 3
  - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . **OAO**
    - . . . . OAO 1
    - . . . . OAO 2
    - . . . . OAO 3
- RT Agena B rocket vehicle
  - Atlas launch vehicles
  - HEAO
  - HEAO 1
  - HEAO 2
  - HEAO 3
  - manned orbital telescopes

## OAO 1

- UF *OAO-A*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . OAO
  - . . . . **OAO 1**
  - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . OAO
    - . . . . **OAO 1**
- RT Atlas Centaur launch vehicle

## OAO 2

- UF *OAO-A2*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . OAO
  - . . . . **OAO 2**
  - observatories
    - . astronomical observatories
    - . . astronomical satellites
    - . . . OAO
    - . . . . **OAO 2**
- RT Atlas Centaur launch vehicle

## OAO 3

- UF *Copernicus spacecraft OAO-C*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . OAO
  - . . . . **OAO 3**
  - observatories

- . astronomical observatories
- . . astronomical satellites
- . . . OAO
- . . . . **OAO 3**
- RT Atlas Centaur launch vehicle

## OAO-A

- USE **OAO 1**

## OAO-A2

- USE **OAO 2**

## OAO-C

- USE **OAO 3**

## oases

- RT aquifers
  - arid lands
  - desertification
  - deserts
  - potable water
  - springs (water)
  - vegetation
  - wells

## oats

- GS farm crops
  - . grains (food)
  - . . **oats**
  - plants (botany)
  - . **oats**
- RT agriculture
  - botany
  - crop growth
  - crop vigor
  - curing
  - Earth resources
  - ∞ food
  - grasses
  - irrigation
  - seeds

## Oberon

- DEF A satellite of Uranus orbiting at a mean distance of 587,000 kilometers.
- GS celestial bodies
  - . natural satellites
  - . . Uranus satellites
  - . . . **Oberon**
- RT Uranus (planet)

## obesity

- RT body fluids
  - body measurement (biology)
  - body size (biology)
  - body volume (biology)
  - body weight
  - metabolism

## object programs

- GS computer programs
  - . **object programs**

## object-oriented programming

- (added October 1991)*
- DEF The use of a programming language consisting of a sequence of commands directed at objects.
- GS computer programming
  - . **object-oriented programming**
- RT Ada (programming language)
  - C++ (programming language)
  - Java (programming language)
  - software development tools
  - software engineering

## oblate spheroids

- DEF Ellipsoids of revolution, the shorter axis of which is the axis of revolution.
- GS geometry
  - . Euclidean geometry
  - . . analytic geometry
  - . . . spheroids
  - . . . . **oblate spheroids**
- RT ellipticity
  - fineness ratio
  - flattening
  - geodesy
  - geoids

- prolate spheroids
- shapes
- solar oblateness

## oblique coordinates

- DEF Magnitudes defining a point relative to two intersecting nonperpendicular lines, called axes.
- GS coordinates
  - . **oblique coordinates**
- RT Cartesian coordinates

## oblique shock waves

- DEF Shock waves attached to the bow and tail of an aerodynamic vehicle moving faster than the speed of sound. The sides of the oblique shock waves form the Mach cone.
- GS elastic waves
  - . shock waves
  - . . **oblique shock waves**
- RT magneto hydrodynamic waves
  - normal shock waves
  - shock layers
  - supersonic compressors

## oblique wings

- GS airfoils
  - . wings
  - . . **oblique wings**
- RT aerodynamic configurations
  - aircraft parts
  - aircraft structures
  - drone aircraft
  - pilotless aircraft
  - remotely piloted vehicles
  - wing planforms

## obliqueness

- DEF The state of being neither perpendicular nor horizontal.
- RT angles (geometry)
  - incident radiation

## obscuration

- USE **occultation**

## observability (systems)

- DEF The property of a system for which observations of the output variables always is sufficient to determine the initial values of all state variables.
- RT boundary value problems
  - control theory
  - dependent variables
  - feedback control
  - independent variables
  - observation
  - parameter identification
  - state vectors
  - system identification
  - ∞ systems
  - systems analysis
  - systems engineering

## observation

- GS **observation**
  - . Earth observations (from space)
  - . . satellite observation
  - . . radio observation
  - . . sky surveys (astronomy)
  - . . space observations (from Earth)
  - . . visual observation
- RT counting
  - data acquisition
  - detection
  - evaluation
  - examination
  - forest fire detection
  - NOESS
  - observability (systems)
  - ∞ performance
  - reconnaissance
  - surveillance

## observation aircraft

- GS **observation aircraft**
  - . Cessna L-19 aircraft
  - . OH-4 helicopter
  - . OH-5 helicopter

- . OH-6 helicopter
- . OV-1 aircraft
- . OV-10 aircraft
- RT ∞ aircraft
  - antisubmarine warfare aircraft
  - arc clouds
  - balloons
  - flying platforms
  - gliders
  - HS-801 aircraft
  - light aircraft
  - light helicopters
  - ∞ military aircraft
  - reconnaissance aircraft
  - utility aircraft
  - weather reconnaissance aircraft

**observation scheduling**  
(added November 2002)

DEF The development of chronologies and observational plans for remote-sensing satellites, astronomical and planetary observatories, and other observational platforms.

GS scheduling
 

- . **observation scheduling**

RT astronomical observatories
 

- Earth observations (from space)
- mission planning
- remote sensing
- space observations (from Earth)

**observatories**

GS **observatories**

- . astronomical observatories
- . . . astronomical satellites
- . . . Astronomical Netherlands Satellite
- . . . Gamma Ray Observatory
- . . . Ginga satellite
- . . . HEAO
  - . . . . HEAO 1
  - . . . . HEAO 2
  - . . . . HEAO 3
  - . . . . HEAO 4
- . . . Hubble Space Telescope
- . . . Infrared Astronomy Satellite
- . . . Infrared Space Observatory (ISO)
- . . . IUE
- . . . Large Deployable Reflector
- . . . Magellan ultraviolet astronomy satellite
- . . . OAO
  - . . . . OAO 1
  - . . . . OAO 2
  - . . . . OAO 3
- . . . OSO
  - . . . . AOSO
  - . . . . OSO-1
  - . . . . OSO-2
  - . . . . OSO-3
  - . . . . OSO-4
  - . . . . OSO-5
  - . . . . OSO-6
  - . . . . OSO-7
  - . . . . OSO-8
  - . . . . OSO-C
- . . . Quasat
- . . . SAS
  - . . . . Explorer 53 satellite
  - . . . . SAS-1
  - . . . . SAS-2
  - . . . . SAS-3
- . . . Constellation-X
- . . . Fermi Gamma-ray Space Telescope
- . . . James Webb Space Telescope
- . . . Kepler mission
- . . . LISA (observatory)
- . . . Space Infrared Telescope Facility
- . . . Spartan satellites
- . . . Submillimeter Wave Astronomy Satellite
- . . . Swift observatory
- . . . Tenma satellite
- . . . Wide-field Infrared Survey Explorer
- . . . X Ray Astrophysics Facility
- . . . XMM-Newton telescope
- . . . Astroplane

- . . . ROSAT mission
- . . . SOFIA (airborne observatory)
- . . . solar observatories
  - . . . . OSO
    - . . . . . AOSO
    - . . . . . OSO-1
    - . . . . . OSO-2
    - . . . . . OSO-3
    - . . . . . OSO-4
    - . . . . . OSO-5
    - . . . . . OSO-6
    - . . . . . OSO-7
    - . . . . . OSO-8
    - . . . . . OSO-C
  - . . . . Pinhole Occulter Facility
  - . . . . STEREO (observatory)
  - . . . . European Southern Observatory
  - . . . . LIGO (observatory)
    - . . . . . geophysical observatories
  - . . . . OGO
    - . . . . . EGO
    - . . . . . OGO-3
    - . . . . . OGO-5
    - . . . . . OGO-A
    - . . . . . POGO
      - . . . . . . OGO-4
      - . . . . . . OGO-6
      - . . . . . . OGO-C
    - . . . . . OSO
      - . . . . . . AOSO
      - . . . . . . OSO-1
      - . . . . . . OSO-2
      - . . . . . . OSO-3
      - . . . . . . OSO-4
      - . . . . . . OSO-5
      - . . . . . . OSO-6
      - . . . . . . OSO-7
      - . . . . . . OSO-8
      - . . . . . . OSO-C
    - . . . . . CLARREO (observatory)
    - . . . . . Glory Mission satellite
    - . . . . . Jodrell Bank Observatory
    - . . . . . Kuiper Airborne Observatory
    - . . . . . lunar observatories
- RT artificial satellites

**obsidian**

GS rocks
 

- . igneous rocks
- . . . **obsidian**
  - . . . . moldavite

RT glass
 

- minerals
- powder (particles)
- pumice
- silicon dioxide
- soils

**obsidian glass**

GS glass
 

- . **obsidian glass**

**obstacle avoidance**

DEF The use of sensors utilizing laser triangulation as means of preventing collisions, especially in the operation of roving vehicles on planetary surfaces.

RT aircraft maneuvers
 

- evasive actions
- tactics
- terrain following
- vulnerability

**obstacles**

USE **barriers**

**obstructing**

USE **blocking**

**occipital lobes**

GS anatomy
 

- . nervous system
  - . . central nervous system
  - . . . brain
    - . . . . cerebrum
    - . . . . . **occipital lobes**

**occlusion**

DEF Specifically, the trapping of undissolved gas in a solid during solidification.

RT degassing
 

- gas-metal interactions
- gas-solid interfaces
- solidification

**occultation**

DEF The disappearance of a body behind another body of larger apparent size. Used for obscuration.

UF *obscuration*

GS **occultation**

- . lunar occultation
- . . solar eclipses
- . radio occultation
- . stellar occultation

RT ∞ conjunction

eclipses

extinguishing

Pinhole Occulter Facility

∞ transit

**occupation**

RT industrial safety
 

- personnel
- work

**occupational diseases**

GS diseases

. **occupational diseases**

RT

- anemias
- carbon monoxide poisoning
- cataracts
- emphysema
- hazards
- health physics
- lead poisoning
- leukemias
- operational hazards
- public health
- pulmonary lesions
- radiation hazards
- toxic hazards
- tumors

**occurrences**

RT events

**ocean bottom**

RT beds (geology)
 

- continental shelves
- core sampling
- cratons
- deep water
- geology
- marine chemistry
- mid-ocean ridges
- mud
- oceanography
- sea floor spreading
- seamounts
- sediments
- sludge
- submarine hydrothermal vents
- underwater resources

**ocean color scanner**

DEF A multispectral scanning radiometer which is geared to observe ocean features such as chlorophyll, sediments, and topography in the invisible and thermal ranges of radiation.

GS scanners

. **ocean color scanner**

. . Coastal Zone Color Scanner

. . Sea-viewing Wide Field-of-view Sensor

RT

- chlorophylls
- coastal water
- colorimetry
- multispectral band scanners
- ocean data acquisitions systems
- oceanographic parameters
- oceanography
- photomapping
- remote sensors
- water color

**ocean currents**

GS circulation

- . water circulation
- . . water currents

# ocean data acquisitions systems

- . . . **ocean currents**
- . . . . coastal currents
- . . . . el Nino
- . . . . Gulf Stream
- . . . . Lomonosov current
- RT core sampling
- ∞ currents
- fluid flow
- frontal waves
- gyres
- hydrography
- Kelvin waves
- littoral drift
- littoral transport
- ocean dynamics
- oceanography
- oceans
- pressure ice
- salinity
- Spitsbergen (Norway)
- thermohaline circulation
- tidal waves
- tide powered generators
- tide powered machines
- tidepower
- tides
- TOPEX
- upwelling water
- waterwave energy conversion
- waterwave powered machines
- ocean data acquisitions systems**
- UF *ocean data platforms*
- ocean data stations*
- ODAS
- RT Argos system
- automatic weather stations
- buoys
- Coastal Zone Color Scanner
- ∞ data
- data acquisition
- ground stations
- instrument packages
- meteorological parameters
- ocean color scanner
- oceanographic parameters
- ships
- transoceanic systems
- underwater research laboratories
- weather stations
- ocean data platforms*
- USE **ocean data acquisitions systems**
- ocean data stations*
- USE **ocean data acquisitions systems**
- ocean dynamics**
- DEF The study of the controlling forces in different ocean phenomena.
- RT air water interactions
- dynamic characteristics
- ∞ dynamics
- fluid dynamics
- hydrodynamics
- ocean currents
- ocean models
- ocean surface
- oceanography
- QuikSCAT satellite
- thermohaline circulation
- water waves
- ocean floor spreading*
- USE **sea floor spreading**
- ocean models**
- GS models
- . **ocean models**
- RT air water interactions
- atmospheric models
- climate models
- dynamic models
- marine environments
- mathematical models
- ocean dynamics
- oceanography
- Sargasso Sea
- sea roughness

- sea states
- ocean surface**
- RT Earth surface
- fluid flow
- hydrography
- ocean dynamics
- oceanographic parameters
- oceanography
- polynyas
- Sargasso Sea
- sea level
- sea roughness
- sea states
- sea surface temperature
- sea truth
- sea water
- Sea-viewing Wide Field-of-view Sensor
- storm surges
- ∞ surfaces
- tidal waves
- tide powered generators
- tide powered machines
- tidepower
- tides
- TOPEX
- waterwave energy conversion
- waterwave powered machines
- ocean temperature**
- DEF Surface or subsurface temperature of an entire or specific region of an ocean.
- GS oceanographic parameters
- . **ocean temperature**
- . . sea surface temperature
- temperature
- . water temperature
- . . **ocean temperature**
- . . . sea surface temperature
- RT el Nino
- oceanography
- oceans
- offshore energy sources
- sea states
- sea truth
- sea water
- seas
- solar sea power plants
- surface temperature
- temperature distribution
- temperature gradients
- thermal pollution
- thermohaline circulation
- ocean thermal energy conversion**
- GS energy conversion
- . **ocean thermal energy conversion**
- RT ∞ conversion
- ∞ energy sources
- geothermal energy conversion
- geothermal technology
- renewable energy
- solar sea power plants
- temperature
- oceanographic parameters**
- GS **oceanographic parameters**
- . ocean temperature
- . . sea surface temperature
- RT Atmospheric & Oceanographic Inform Sys
- Coastal Zone Color Scanner
- hindcasting
- integrated global ocean station systems
- meteorological parameters
- ocean color scanner
- ocean data acquisitions systems
- ocean surface
- salinity
- sea states
- oceanography**
- DEF The science that deals with the study and exploration of seas and oceans.
- RT artificial harbors
- Atmospheric & Oceanographic Inform Sys
- bathymeters

- bay ice
- breakwaters
- coastal currents
- Coastal Zone Color Scanner
- core sampling
- deep scattering layers
- deep water
- deepwater terminals
- Earth & Ocean Physics Applications Program
- Earth planetary structure
- Earth resources
- Earth sciences
- environmental monitoring
- EROS (satellites)
- estuaries
- fjords
- frontal waves
- GARP Atlantic Tropical Experiment
- geography
- geology
- geophysics
- gyres
- harbors
- hydroclimatology
- hydrography
- hydrology
- ice floes
- ice mapping
- isthmuses
- Landsat satellites
- marine biology
- marine environments
- marine meteorology
- marine resources
- marine technology
- marshlands
- meteorology
- mid-ocean ridges
- ocean bottom
- ocean color scanner
- ocean currents
- ocean dynamics
- ocean models
- ocean surface
- ocean temperature
- oceans
- offshore docking
- offshore platforms
- oil slicks
- pelagic zone
- ∞ physical sciences
- red tide
- reefs
- Sargasso Sea
- ∞ science
- sea grasses
- sea ice
- sea level
- sea roughness
- sea states
- sea surface temperature
- sea water
- seas
- SEASAT 1
- SEASAT program
- SEASAT satellites
- SEASAT-B satellite
- seaweeds
- shallow water
- shipyards
- shoals
- shorelines
- storm surges
- submarine hydrothermal vents
- tanker terminals
- thermoclines
- tidal waves
- tide powered generators
- tidepower
- tides
- TOPEX
- topography
- underwater research laboratories
- underwater resources
- water circulation
- water currents
- waterfowl
- waterwave energy

waterwave energy conversion  
wetlands

**oceans**

DEF The continuous salt water bodies that surround the continents and fill the Earth's great depressions.

GS **oceans**  
. Antarctic Ocean  
. Arctic Ocean  
. Atlantic Ocean  
. extraterrestrial oceans  
. Indian Ocean  
. Pacific Ocean

RT coastal currents  
coastal water  
coasts  
deep water  
Earth hydrosphere  
geography  
keys (islands)  
marine resources  
nearshore water  
ocean currents  
ocean temperature  
oceanography  
seas  
seaweeds  
shallow water  
shoals  
shorelines  
sounds (topographic features)  
thermal pollution  
tidal flats  
tide powered generators  
water color  
water depth  
water resources  
waterwave energy conversion

*Octahedral Research Satellites*

USE **Environmental Research Satellites**

*octahedrite*

USE **anatase**

**octahedrons**

GS geometry  
. Euclidean geometry  
. . polyhedrons  
. . . **octahedrons**

∞ **octane**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT antiknock additives  
octanes

**octane number**

RT gasoline

**octanes**

SN (ACYCLIC HYDROCARBONS)  
GS organic compounds  
. hydrocarbons  
. . aliphatic hydrocarbons  
. . . alkanes  
. . . . **octanes**

RT antiknock additives  
∞ octane

**octaves**

DEF The intervals between two frequencies having the ratio 1:2.

GS range (extremes)  
. frequency ranges  
. . **octaves**

RT acoustics  
music

**octets**

GS valence  
. **octets**  
RT atomic structure  
chemical bonds

**octoates**

GS esters

. **octoates**

**octol (explosive)**

GS explosives  
. **octol (explosive)**

**octopuses**

GS animals  
. invertebrates  
. . mollusks  
. . . cephalopods  
. . . . **octopuses**

**ocular circulation**

GS circulation  
. blood circulation  
. . **ocular circulation**

**oculogravic illusions**

GS psychological effects  
. illusions  
. . **oculogravic illusions**

RT gravireceptors  
otolith organs  
vertical perception

**oculometers**

GS measuring instruments  
. optical measuring instruments  
. . **oculometers**  
optical equipment  
. optical measuring instruments  
. . **oculometers**

RT eye movements  
∞ instruments  
optical tracking

**oculomotor nerves**

GS anatomy  
. nervous system  
. . nerves  
. . . **oculomotor nerves**  
. sense organs  
. . eye (anatomy)  
. . . **oculomotor nerves**  
RT vision

**ODAS**

USE **ocean data acquisitions systems**

**odd-even nuclei**

GS particles  
. charged particles  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **odd-even nuclei**  
. corpuscular radiation  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **odd-even nuclei**  
RT even-even nuclei  
odd-odd nuclei

**odd-odd nuclei**

GS particles  
. charged particles  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **odd-odd nuclei**  
. corpuscular radiation  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **odd-odd nuclei**  
RT even-even nuclei  
nuclear structure  
∞ nuclei  
odd-even nuclei

**Odessa meteorite**

GS celestial bodies  
. meteorites  
. . iron meteorites  
. . . **Odessa meteorite**

**odors**

RT air pollution  
combustion products  
exhaust gases

gases

**offgassing**

DEF The relative high mass loss characteristic of many nonmetallic materials upon initial vacuum exposure.

RT degassing  
vacuum  
vacuum effects

**office automation**

RT ∞ automation  
man machine systems  
word processing

*Office of Space & Terrestri Applic Payloads*

USE **OSTA-1 payload**  
**OSTA-2 payload**  
**OSTA-3 payload**

**off-on control**

DEF Flicker control, especially as applied to rockets. Used for bang-bang control.

UF *bang-bang control*  
GS automatic control  
. **off-on control**

RT ∞ control  
control equipment  
control theory  
proportional control  
servocontrol  
solenoid valves

**offshore docking**

GS maneuvers  
. docking  
. . **offshore docking**  
RT artificial harbors  
cargo ships  
deepwater terminals  
marine technology  
marine transportation  
oceanography  
ship terminals  
tanker ships  
tanker terminals  
∞ tankers  
terminal facilities  
transportation

**offshore energy sources**

RT crude oil  
deepwater terminals  
drilling  
energy technology  
marine technology  
ocean temperature  
oil exploration  
oil fields  
sea breeze  
seepage

**offshore platforms**

RT artificial harbors  
cargo ships  
deepwater terminals  
marine technology  
oceanography  
∞ platforms  
tanker ships  
tanker terminals  
∞ tankers  
terminal facilities  
transportation

**offshore reactor sites**

GS sites  
. **offshore reactor sites**  
RT reactor design  
reactor safety  
reactor technology



**ogee shape**

remote regions

*OFT*  
USE **Space Transportation System flights**

*OFT 1*  
USE **Space Transportation System 1 flight**

*OFT 2*  
USE **Space Transportation System 2 flight**

*OFT 3*  
USE **Space Transportation System 3 flight**

*OFT 4*  
USE **Space Transportation System 4 flight**

**ogee shape**  
GS shapes  
. **ogee shape**  
RT variable sweep wings

*ogee wings*  
USE **variable sweep wings**

**ogives**  
DEF Bodies of revolution formed by rotating a circular arc about an axis that intersects the arc; the shape of these bodies; also noses of projectiles or the like so shaped.  
RT bodies of revolution  
ellipsoids  
fairings  
nose cones  
spheres  
streamlined bodies  
symmetrical bodies

**OGO**  
UF *Orbiting Geophysical Observatory*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... EGO  
... OGO-3  
... OGO-5  
... OGO-A  
... POGO  
... OGO-4  
... OGO-6  
... OGO-C  
observatories  
. geophysical observatories  
.. **OGO**  
... EGO  
... OGO-3  
... OGO-5  
... OGO-A  
... POGO  
... OGO-4  
... OGO-6  
... OGO-C  
RT Gamma Ray Observatory

**OGO-3**  
UF *OGO-B*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... **OGO-3**  
observatories  
. geophysical observatories  
.. **OGO**  
... **OGO-3**  
RT Thor Agena launch vehicle

**OGO-4**  
UF *OGO-D*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... POGO  
... **OGO-4**  
observatories  
. geophysical observatories  
.. **OGO**

... POGO  
... **OGO-4**  
RT geodesy

**OGO-5**  
UF *OGO-E*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... **OGO-5**  
observatories  
. geophysical observatories  
.. **OGO**  
... **OGO-5**  
RT geodesy

**OGO-6**  
UF *OGO-F*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... POGO  
... **OGO-6**  
observatories  
. geophysical observatories  
.. **OGO**  
... POGO  
... **OGO-6**

**OGO-A**  
UF *S-49 satellite*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... **OGO-A**  
observatories  
. geophysical observatories  
.. **OGO**  
... **OGO-A**  
RT Atlas Agena launch vehicles

*OGO-B*  
USE **OGO-3**

**OGO-C**  
UF *S-50 satellite*  
GS artificial satellites  
. geophysical satellites  
.. **OGO**  
... POGO  
... **OGO-C**  
observatories  
. geophysical observatories  
.. **OGO**  
... POGO  
... **OGO-C**

*OGO-D*  
USE **OGO-4**

*OGO-E*  
USE **OGO-5**

*OGO-F*  
USE **OGO-6**

**OH-4 helicopter**  
UF *HO-4 helicopter*  
GS Bell aircraft  
. **OH-4 helicopter**  
light aircraft  
. light helicopters  
.. **OH-4 helicopter**  
observation aircraft  
. **OH-4 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... light helicopters  
... **OH-4 helicopter**  
... military helicopters  
... **OH-4 helicopter**

**OH-5 helicopter**  
UF *FH-1100 helicopter*  
*HO-5 helicopter*  
GS Fairchild-Hiller aircraft  
. **OH-5 helicopter**  
Hiller aircraft  
. **OH-5 helicopter**

light aircraft  
. light helicopters  
.. **OH-5 helicopter**  
observation aircraft  
. **OH-5 helicopter**  
passenger aircraft  
. **OH-5 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... light helicopters  
... **OH-5 helicopter**  
... military helicopters  
... **OH-5 helicopter**  
RT rigid rotor helicopters

**OH-6 helicopter**  
UF *HO-6 helicopter*  
*LOH helicopter*  
GS Hughes aircraft  
. **OH-6 helicopter**  
light aircraft  
. light helicopters  
.. **OH-6 helicopter**  
observation aircraft  
. **OH-6 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... light helicopters  
... **OH-6 helicopter**  
... military helicopters  
... **OH-6 helicopter**

**OH-13 helicopter**  
UF *H-13 helicopter*  
*Sioux helicopter*  
*UH-13 helicopter*  
GS Bell aircraft  
. **OH-13 helicopter**  
light aircraft  
. **OH-13 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... military helicopters  
... **OH-13 helicopter**

**OH-23 helicopter**  
UF *H-23 helicopter*  
*Raven helicopter*  
*UH-12 helicopter*  
GS Fairchild-Hiller aircraft  
. **OH-23 helicopter**  
light aircraft  
. **OH-23 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... military helicopters  
... **OH-23 helicopter**

**OH-58 helicopter**  
GS light aircraft  
. light helicopters  
.. **OH-58 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
.. helicopters  
... light helicopters  
... **OH-58 helicopter**  
... military helicopters  
... **OH-58 helicopter**

**Ohio**  
GS nations  
. United States  
.. **Ohio**  
RT Ohio River (US)  
Wabash River Basin (IL-IN-OH)

**Ohio River (US)**  
GS rivers  
. **Ohio River (US)**  
RT Illinois  
Indiana  
Kentucky  
Ohio  
Pennsylvania

West Virginia

**ohmic dissipation**

- UF *Joule heating*
- GS dissipation
  - . **ohmic dissipation**
- RT Joule-Thomson effect  
levitation melting  
losses

**ohmmeters**

DEF Direct-reading instruments for measuring electrical resistance. They are provided with a scale, usually graduated in either ohms, megohms, or both. If the scale is graduated in megohms, the instrument is usually called a megohmmeter.

- GS measuring instruments
  - . **ohmmeters**
- RT electrical conductivity meters  
electrical impedance  
electrical measurement  
electrical resistance  
resistance thermometers  
transconductance  
Wheatstone bridges

**Ohms law**

DEF The current in an electric circuit is inversely proportional to the resistance of the circuit and is directly proportional to the electromotive force in the circuit. Ohm's law applies, strictly speaking, only to linear constant-current circuits.

- GS circuits
  - . **Ohms law**
  - laws
  - . **Ohms law**
- RT  $\infty$  conductivity  
electric current  
electrical resistance  
electricity  
electromotive forces  
transconductance  
volt-ampere characteristics

*Ohzora satellite*USE **EXOS-C satellite****oil additives**

- GS additives
  - . **oil additives**

**oil exploration**

- GS exploration
  - . **oil exploration**
- RT crude oil  
drilling  
energy policy  
geology  
natural gas exploration  
offshore energy sources  
tar sands  
underwater resources

**oil fields**

DEF Surface boundary of an area from which petroleum is obtained; may correspond to an oil pool or may be circumscribed by political or legal limits.

- GS resources
  - . Earth resources
  - . . **oil fields**
- RT crude oil  
drilling  
methane  
natural gas  
offshore energy sources  
oils  
tar sands

**oil pollution**

- GS pollution
  - . environment pollution
  - . . water pollution
  - . . . **oil pollution**
- RT coastal ecology  
environmental cleanup

wetlands

**oil recovery**

- RT energy technology  
reclamation
  - $\infty$  recovery
  - reuse

**oil slicks**

- UF *slicks*
- RT dumping  
environment pollution  
environmental cleanup  
oceanography  
pollution  
spilling  
water pollution

**oils**

- GS **oils**
  - . castor oil
  - . crude oil
  - . fuel oils
  - . lubricating oils
  - . mineral oils
  - . shale oil
- RT energy policy  
fats  
fuels  
greases  
hydraulic fluids  
kerogen  
lipid metabolism  
lubricants  
oil fields  
petroleum products  
pitch (material)  
retort processing  
tar sands

**Okazaki-Levy-Rudenko comet**

- (added May 1991)
- GS celestial bodies
  - . comets
  - . . **Okazaki-Levy-Rudenko comet**

**Okhansk meteorite**

- GS celestial bodies
  - . meteorites
    - . . stony meteorites
    - . . . chondrites
    - . . . . **Okhansk meteorite**
- RT iron meteorites

**Oklahoma**

- GS nations
  - . United States
  - . . **Oklahoma**
- RT Lake Texoma (OK-TX)

*olefins*USE **alkenes****oleic acid**

- GS acids
  - . carboxylic acids
  - . . fatty acids
  - . . . **oleic acid**
- organic compounds
  - . carboxylic acids
  - . . fatty acids
  - . . . **oleic acid**

**olfactory perception**

- UF *smell*
- GS perception
  - . sensory perception
  - . . **olfactory perception**
- RT chemoreceptors  
sense organs

**oligomers**

- (added January 1990)
- GS **oligomers**
  - . dimers
  - . trimers
- RT monomers  
polymer chemistry  
polymerization

 $\infty$  polymers**oligonucleotides**

(added August 2004)  
DEF Polymers made up of a few (2-20) nucleotides. In molecular genetics, they refer to a short sequence synthesized to match a region where a mutation is known to occur, and then used as a probe.

- GS biopolymers
  - . **oligonucleotides**
  - organic compounds
    - . nucleotides
    - . . **oligonucleotides**
- RT adenosines  
polymerase chain reaction
- $\infty$  polymers

**olivine**

- GS minerals
  - . **olivine**
  - . . forsterite
- RT dunite  
igneous rocks  
monticellite  
peridotite  
regolith  
rocks  
soils

**Oman**

- GS nations
  - . **Oman**

*OMCVD (vapor deposition)*USE **metalorganic chemical vapor deposition***OME*USE **Orbit Maneuvering Engine (Space Shuttle)****Omega Navigation System**

DEF A very long distance navigation system operating at approximately 10 kHz (kilohertz), in which hyperbolic lines of position are determined by measurement of the difference in travel time of continuous wave signals from two transmitters separated by 5000 nmi (nautical miles) to 6000 nmi (9000 km {kilometers} to 11000 km) or in which changes in distances from the transmitters are measured by counting RF (radio frequency) wavelengths in the space of lanes as the vehicle moves from a known position, the lanes being counted by phase comparison with a stable oscillator aboard the vehicle.

- GS navigation
  - . **Omega Navigation System**
- RT air navigation
  - $\infty$  systems

**omega-mesons**

- GS particles
  - . elementary particles
  - . . bosons
  - . . . mesons
  - . . . . **omega-mesons**
  - . . fermions
  - . . . baryons
  - . . . . **omega-mesons**
  - . . hadrons
  - . . . baryons
  - . . . . **omega-mesons**
  - . . mesons
  - . . . . **omega-mesons**
  - . . nuclear particles
  - . . bosons
  - . . . mesons
  - . . . . **omega-mesons**
- RT charged particles  
eta-mesons

**omegatrons**

- GS particle accelerators
  - . cyclotrons
  - . . **omegatrons**

**Omicron Ceti star**

- UF *Mira Ceti star*
- GS celestial bodies

## omnidirectional antennas

- . stars
- .. giant stars
- ... **Omicron Ceti star**
- .. late stars
- ... cool stars
- ... Mira variables
- ... **Omicron Ceti star**
- .. variable stars
- ... Mira variables
- ... **Omicron Ceti star**

### omnidirectional antennas

GS antennas

- . **omnidirectional antennas**
- .. monopole antennas
- .. whip antennas
- .. turnstile antennas

RT dipole antennas  
directional antennas  
microwave antennas  
radio antennas

### omnidirectional radio ranges

GS navigation aids

- . beacons
- .. radio beacons
- ... **omnidirectional radio ranges**
- ... self calibrating omnirange

radio equipment

- . radio transmitters
- .. radio beacons
- ... **omnidirectional radio ranges**
- ... self calibrating omnirange

transmitters

- . radio transmitters
- .. radio beacons
- ... **omnidirectional radio ranges**
- ... self calibrating omnirange

RT distance measuring equipment  
radio navigation  
solar compasses

*Omnipol HC-3 helicopter*  
USE **HC-3 helicopter**

*Omnipol L-29 aircraft*  
USE **L-29 jet trainer**

*Omnipol Z-37 aircraft*  
USE **Z-37 aircraft**

*omnirange navigation*  
USE **VHF omnirange navigation**

*onboard computers*  
USE **airborne/spaceborne computers**

### onboard data processing

DEF Processing of acquired data aboard an aircraft, satellite, etc., rather than transmission to ground stations for processing.

GS data processing

- . **onboard data processing**

RT airborne/spaceborne computers

∞ data

- flight management systems
- image processing
- microprocessors
- real time operation
- signal processing

### onboard equipment

GS **onboard equipment**

- . airborne equipment
- .. airborne/spaceborne computers
- .. Light Airborne Multipurpose System
- .. TERCOM
- . airborne lasers
- . aircraft equipment
- .. bombing equipment
- .. ejection seats
- ... flying ejection seats
- .. TERCOM
- . spacecraft equipment
- .. spacecraft electronic equipment

RT airborne surveillance radar

∞ aircraft

- bubble technique
- crew procedures (preflight)

∞ equipment

- flight instruments
- flight operations
- flight safety
- heating equipment
- life support systems
- lighting equipment
- radar equipment
- radio equipment
- spacecraft instruments
- stowage (onboard equipment)
- survival equipment
- telecommunication

∞ test equipment

- training devices

### oncogenes

(added July 2002)

DEF Genes that have the potential of turning any normal cell into one that is cancerous.

UF *cancer genes*  
*transforming genes*

GS genes

- . **oncogenes**

RT cancer  
gene expression  
mutations

### one dimensional flow

GS fluid flow

- . **one dimensional flow**

RT annular flow  
axial flow  
core flow  
flow geometry  
Hugoniot equation of state  
three dimensional flow  
two dimensional flow

*one-phase flow*  
USE **single-phase flow**

*anisotropy*  
USE **anisotropy**

### on-line programming

GS computer programming

- . **on-line programming**

### on-line systems

DEF Systems where the input data enters the computer directly from the point of origin and/or in which output data is transmitted directly to where it is used.

RT client server systems  
computer programs  
computer techniques  
data management  
data processing  
information retrieval  
information systems  
integrated library systems  
numerical data bases

∞ systems

- web services
- websites

### Onsager phenomenological coefficient

GS coefficients

- . **Onsager phenomenological coefficient**

RT flux density  
plasmas (physics)  
statistical mechanics  
variational principles

### Onsager relationship

RT ∞ equilibrium  
irreversible processes  
thermodynamics

### Ontario

GS nations

- . Canada
- .. **Ontario**

*ontogenesis*  
USE **ontogeny**

**ontogeny**

UF *ontogenesis*

RT biogeny  
evolution (development)  
growth  
neurophysiology

*oocytes*  
USE **gametocytes**

### Oort cloud

DEF A region of millions of comets between 30,000 and 100,000 A.U. from the sun. Comets are perturbed out of the Oort cloud by passing stars and fall into the inner solar system. The Oort cloud was named after the Dutch astronomer, Jan Hendrik Oort.

RT ∞ clouds

- comet nuclei
- comets
- Hale-Bopp comet
- Kuiper belt
- Nemesis (star)
- solar system
- trans-Neptunian objects

### opacifiers

GS additives

- . **opacifiers**

RT ∞ agents  
fillers

### opacity

DEF Of an optical path, the reciprocal of transmission.

GS electromagnetic properties

- . optical properties
- .. **opacity**

RT absorptance  
absorptivity  
acoustics  
atmospheric optics  
attenuation coefficients  
clarity  
density (mass/volume)  
electromagnetic absorption  
haze  
Kramers-Kronig formula  
light (visible radiation)  
light transmission  
refractivity  
translucence  
transmission efficiency  
transmissivity  
transparence  
turbidity  
underwater optics  
visibility

### opalescence

RT iridescence  
optical properties

### open channel flow

GS fluid flow

- . internal flow
- .. channel flow
- ... **open channel flow**
- . liquid flow
- .. **open channel flow**

RT cavity flow  
laminar flow  
meanders  
pipe flow  
turbulent flow  
water flow

### open circuit voltage

DEF The steady state or equilibrium potential of an electrode in absence of external current flow to or from the electrode.

GS potential energy

- . electric potential
- .. **open circuit voltage**

RT bias  
capacitance  
electrical properties  
electrical resistivity  
electromotive forces  
energy conversion efficiency  
overvoltage

∞ potential

power gain  
short circuit currents  
solar cells  
static electricity  
volt-ampere characteristics

**open clusters**

GS celestial bodies  
. star clusters  
. . . **open clusters**  
. . . Pleiades cluster  
. . . Praesepe star clusters  
RT Population I stars

**OPEN Project**

DEF A former NASA project now absorbed by the International Solar Terrestrial Physics Project. It proposed a simultaneous study of plasmas in the Earth's magnetosphere and neighborhood using the following four instrumented spacecraft: interplanetary physics laboratory (IPL), geomagnetic tail laboratory (GTL), polar plasma laboratory (PPL), and equatorial magnetosphere laboratory (EML). Used for Origin of Plasmas in Earth Neighborhood.

UF *Origin of Plasmas in Earth Neighborhood*

GS programs  
. NASA programs  
. . . NASA space programs  
. . . **OPEN Project**  
. projects  
. . . **OPEN Project**  
. space programs  
. . . NASA space programs  
. . . **OPEN Project**

RT Earth atmosphere  
Earth magnetosphere  
plasma diagnostics  
plasma physics  
plasmosphere  
satellite-borne instruments  
space plasmas

**open source licensing (computers)**

(added April 2002)

DEF An arrangement between a software developer and the public that enables public access to a computer program's source code for the purpose of facilitating continued and efficient software development.

GS licensing  
. **open source licensing (computers)**

RT computer programming  
intellectual property  
operating systems (computers)  
software engineering  
source programs

**openings**

UF *cut-outs*  
GS **openings**  
. apertures  
. . . irises (mechanical apertures)  
. . . numerical aperture  
. . . synthetic apertures  
. ports (openings)  
. slits  
RT annular ducts  
cavities  
cracks  
curtains  
doors  
duct geometry  
ducts  
egress  
exhaust nozzles  
exhaust systems  
gaps  
gates (openings)  
ingress (spacecraft passageway)  
inlet nozzles  
intake systems  
orifices  
outlets  
passageways  
perforated plates  
pipe nozzles  
slots

vents  
windows (apertures)

**operating costs**

DEF The price for operating a system exclusive of the cost of the system itself.

GS costs  
. **operating costs**  
RT airline operations  
economic analysis  
energy policy  
maintenance  
production costs  
systems analysis

**operating systems (computers)**

DEF Computer programs for expediting, controlling and/or recording computer use by other programs. Used for executive systems (computers).

UF *executive systems (computers)*  
GS computer programs  
. computer systems programs  
. . . **operating systems (computers)**  
. . . disk operating system (DOS)  
. . . UNIX (operating system)  
RT assembler routines  
compilers  
computer information security  
computer systems design  
input/output routines  
MIMD (computers)  
open source licensing (computers)  
 $\infty$  routines  
SIMD (computers)  
 $\infty$  systems  
windows (computer programs)

**operating temperature**

GS temperature  
. **operating temperature**  
RT ambient temperature  
combustion temperature  
high temperature superconductors  
room temperature  
wall temperature

**operational amplifiers**

GS amplifiers  
. **operational amplifiers**  
RT amplifier design  
analog circuits  
analog computers  
differential amplifiers  
feedback amplifiers  
linear integrated circuits  
transistor amplifiers

**operational calculus**

RT  $\infty$  applications of mathematics  
calculus  
calculus of variations  
differential equations  
Fourier analysis  
integral calculus  
linear equations

**operational hazards**

GS hazards  
. **operational hazards**  
RT air piracy  
aircraft hazards  
cumulative damage  
flight hazards  
meteoroid hazards  
noise (sound)  
occupational diseases  
radiation hazards

**operational problems**

RT airline operations  
 $\infty$  operations  
 $\infty$  problems  
systems engineering

 $\infty$  operations

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air drop operations  
air traffic control

airline operations  
chemical engineering  
chemical reactions  
clinical medicine  
deployment  
Fishbowl Operation  
loading operations  
mechanization  
mission planning  
operational problems  
operations research  
orifices  
preflight operations  
premature operation  
production engineering  
programs  
projects  
rescue operations  
sequencing  
strategy  
surgery  
systems engineering

**operations research**

GS optimization  
. **operations research**  
RT  $\infty$  applications of mathematics  
computer systems simulation  
computerized simulation  
constraints  
control systems design  
critical path method  
decision theory  
Delphi method (forecasting)  
dynamic programming  
experiment design  
forecasting  
functions (mathematics)  
game theory  
group technology (manufacturing)  
information theory  
Lagrange multipliers  
linear prediction  
linear programming  
management  
management methods  
management planning  
mathematical models  
mathematical programming  
matrix management  
minima  
minimax technique  
mission planning  
multidisciplinary research  
nonlinear programming  
 $\infty$  operations  
 $\infty$  paths  
pattern method (forecasting)  
probability theory  
probe method (forecasting)  
profile method (forecasting)  
project planning  
quality control  
queueing theory  
rand project  
Rayleigh distribution  
research and development  
research management  
risk  
saddle points (game theory)  
sequencing  
simulation  
statistical analysis  
stochastic processes  
strategy  
 $\infty$  synthesis  
synthesis (chemistry)  
systems analysis  
systems engineering  
systems management  
systems simulation  
traveling salesman problem  
urban development  
war games

**operator performance**

GS human performance  
. **operator performance**  
RT astronaut performance

## operators

computer systems performance  
mental performance  
∞ performance  
pilot performance  
psychomotor performance  
situational awareness

### ∞ operators

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT operators (mathematics)  
operators (personnel)  
reactor cores

### operators (mathematics)

UF *differential operators*  
*Fredholm operators*  
GS **operators (mathematics)**  
. Bergman operator  
. linear operators  
RT functions (mathematics)  
integral transformations  
Laplace transformation  
matrix theory  
∞ operators  
perturbation theory  
S matrix theory

### operators (personnel)

GS personnel  
. **operators (personnel)**  
. . . pilots (personnel)  
. . . aircraft pilots  
. . . test pilots  
RT ∞ operators

### Ophiuchi clouds

DEF Dense concentrations of interstellar gas near the stars Rho Ophiuchi and Zeta Ophiuchi.  
RT cloud physics  
∞ clouds  
interstellar gas  
interstellar matter  
nebulae

### ophthalmodynamometry

RT blood pressure  
eye (anatomy)  
vision

### ophthalmology

GS medical science  
. **ophthalmology**  
RT electrophysiology  
eye (anatomy)  
eye diseases  
eye examinations  
miosis  
vestibular nystagmus

### Opik theory

RT nebulae  
Orion constellation  
Orion nebula  
supernovae  
∞ theories

### optical absorption

USE **electromagnetic absorption**  
**light transmission**

### optical activity

DEF Ability to rotate the plane of vibration of polarized light to the right or left.  
RT biochemistry  
carbohydrates  
chromophores  
∞ optics  
organic chemistry  
polarimetry  
polarized light  
stereochemistry

### optical amplifiers

USE **light amplifiers**

### optical bistability

DEF A property of certain materials in which a nonlinear response is exhibited when under

the influence of an external driving coherent light, thereby allowing these materials to behave like optical switches.

GS electromagnetic properties  
. optical properties  
. . **optical bistability**  
RT four-wave mixing  
hysteresis  
integrated optics  
light transmission  
nonlinear optics  
optical data storage materials  
optical equipment  
optical measuring instruments  
optical memory (data storage)  
optical switching  
optical waveguides  
switching circuits

### optical coatings

(added June 2005)  
DEF Coatings applied to the surface of an optical element.  
GS coatings  
. **optical coatings**  
. . birefringent coatings  
RT antireflection coatings  
coating  
electromagnetic scattering  
glass  
lenses  
light scattering  
metal coatings  
mirrors  
optical equipment  
optical materials  
protective coatings  
telescopes

### optical communication

UF *laser communication*  
*light communication*  
*optical signals*  
GS telecommunication  
. communication  
. . **optical communication**  
. . . free-space optical communication  
RT dye lasers  
ground-air-ground communication  
high power lasers  
interplanetary communication  
lasers  
lunar communication  
optical fibers  
∞ optics  
polarization modulation  
quantum communication  
satellite communication  
space communication  
spacecraft communication  
tunable lasers  
visual signals  
wireless communication

### optical computers

DEF Computers which use light rather than electricity for all or part of their operation. They perform multiple tasks in parallel as opposed to electronic computers which would perform those tasks sequentially. Such increased processing capability makes them suited for aerospace problems which involve systems that have a large number of degrees of freedom, i.e., large space structures, pattern recognition activity, and robotics.  
GS data processing equipment  
. computers  
. . **optical computers**  
RT coherent light  
computer design  
electro-optics  
free-space optical interconnects  
optical data processing  
optical equipment  
optical interconnects  
optical memory (data storage)

### optical control

(added September 1993)  
DEF The control of light sensitive devices

by means optical radiation.

RT automatic control  
cascade control  
∞ control  
control equipment  
controllers  
electric control  
electronic control  
electro-optics  
feedback control  
optical equipment  
remote control

### optical correction procedure

GS correction  
. **optical correction procedure**  
procedures  
. **optical correction procedure**  
RT adaptive optics  
adjusting  
anisoplanatism  
errors  
honeycomb mirrors  
instrument errors  
lens design  
∞ optics  
photographic measurement  
photographs  
position errors  
seeing (astronomy)  
segmented mirrors  
self focusing

### optical correlators

(added March 1990)  
GS correlators  
. **optical correlators**  
RT image correlators  
optical data processing

### optical countermeasures

DEF Equipment for exploiting the vulnerability of laser guided weapon systems.  
GS countermeasures  
. **optical countermeasures**  
RT air defense  
antimissile defense  
deception  
electronic countermeasures  
military technology  
missile defense  
optical radar  
∞ optics  
space surveillance (spaceborne)  
stealth technology

### optical coupling

GS coupling  
. electromagnetic coupling  
. . **optical coupling**  
RT couples  
cross coupling  
cross polarization  
laser arrays  
laser mode locking  
light transmission  
microwave coupling  
numerical aperture  
∞ optics  
phase locked systems  
polarization (waves)

### optical data processing

GS data processing  
. **optical data processing**  
RT character recognition  
∞ data  
data acquisition  
data processing equipment  
gray scale  
image classification  
image processing  
lasers  
light modulators  
light valves  
optical computers  
optical correlators  
optical disks  
optical relay systems  
∞ optics

- photonics
  - ∞ processing
  - readers
  - scanners
  - tomography
- optical data storage materials**
  - GS optical materials
    - . **optical data storage materials**
  - RT ∞ data
    - data recording
    - data storage
    - laser applications
    - optical bistability
    - optical memory (data storage)
  - ∞ optics
    - photographic film
    - video disks
- optical density**
  - DEF The image intensity or density in terms of, or measured by, a reflectance densitometer.
  - RT ∞ density
    - microdensitometers
  - ∞ optics
    - translucence
    - transmittance
    - transparence
    - turbidity
    - underwater optics
- optical depolarization**
  - RT light (visible radiation)
  - ∞ optics
    - polarized light
- optical depth*
  - USE **optical thickness**
- optical disks**
  - UF *compact disk read-only memory devices*
  - GS computer components
    - . computer storage devices
    - . . **optical disks**
  - RT CD-ROM
    - data storage
    - laser applications
    - optical data processing
    - optical equipment
    - optical memory (data storage)
    - video disks
- optical emission*
  - USE **light emission**
- optical emission spectroscopy**
  - GS spectroscopy
    - . **optical emission spectroscopy**
    - . . laser spectroscopy
    - . . . optogalvanic spectroscopy
  - RT auroral spectroscopy
    - electron spectroscopy
    - emission spectra
    - light (visible radiation)
  - ∞ optics
- optical equipment**
  - GS **optical equipment**
    - . binoculars
    - . cameras
      - . . Baker-Nunn camera
      - . . ballistic cameras
      - . . CCD cameras
      - . . Delft camera
      - . . diffraction limited cameras
      - . . faint object camera
      - . . high speed cameras
      - . . . framing cameras
      - . . digital cameras
      - . . I2S cameras
      - . . Lallemand cameras
      - . . multispectral band cameras
      - . . panoramic cameras
      - . . pinhole cameras
      - . . Schmidt cameras
      - . . streak cameras
      - . . television cameras
      - . collimators
      - . endoscopes
    - . eyepieces
    - . heliometers
      - . . pyroheliometers
    - . . image converters
      - . . . telescopes
    - . . image tubes
      - . . . thermicons
    - . laser doppler velocimeters
    - . optical gyroscopes
    - . optical measuring instruments
      - . . cathetometers
      - . . diffractometers
      - . . Ebert spectrometers
      - . . ellipsometers
      - . . etalons
      - . . geodimeters
      - . . haploscopes
      - . . infrared spectrometers
        - . . . filter wheel infrared spectrometers
        - . . . light scattering meters
      - . . microdensitometers
      - . . nephelometers
      - . . oculometers
      - . . optical pyrometers
      - . . optical range finders
        - . . . laser range finders
      - . . photogoniometers
      - . . photometers
        - . . . electrophotometers
        - . . . ultraviolet spectrometers
          - . . . . high dispersion spectrographs
          - . . . . Total Ozone Mapping Spectrometer
      - . . quantum well infrared photodetectors
        - . . . ultraviolet spectrophotometers
      - . . polarimeters
      - . . reflectometers
        - . . . microwave reflectometers
      - . . refractometers
      - . . sextants
      - . . spectrophotometers
        - . . . infrared spectrophotometers
        - . . . ultraviolet spectrophotometers
      - . . transits
        - . . . theodolites
          - . . . . cinetheodolites
      - . . transmissometers
      - . optical microscopes
      - . optical scanners
        - . . flying spot scanners
        - . . multispectral band scanners
        - . . . thematic mappers (LANDSAT)
      - . periscopes
        - . . photographic rectifiers
        - . . polariscopes
        - . . Senarmont polariscopes
      - . prisms
        - . . scatter plates (optics)
      - . spectroheliographs
      - . stroboscopes
        - . . wide angle lenses
    - RT absorption spectroscopy
      - acoustic microscopes
      - circumsolar telescopes
      - densitometers
      - Fabry-Perot spectrometers
      - geometrical optics
      - horizon scanners
      - infrared interferometers
      - infrared scanners
      - interferometers
      - lenses
        - look angles (electronics)
        - Mach-Zehnder interferometers
      - microchannels
      - microscopes
      - mirrors
      - monochromators
      - optical bistability
      - optical coatings
      - optical computers
      - optical control
      - optical disks
    - ∞ optics
      - optogalvanic spectroscopy
      - photographic equipment
      - radio telescopes
      - reflecting telescopes
  - refracting telescopes
  - reticles
  - Scanner project
  - scanners
  - spectrometers
  - telescopes
  - tripods
  - video equipment

**optical fibers**

- GS fibers
  - . **optical fibers**
  - . . scintillating fibers
  - optical materials
  - . **optical fibers**
  - . . scintillating fibers
  - waveguides
    - . optical waveguides
  - . **optical fibers**
  - . . . scintillating fibers
- RT Bragg gratings
  - communication cables
  - fiber lasers
  - fiber optics
  - fly by light control
  - glass fibers
  - numerical aperture
  - optical communication
  - plastic fibers
  - transmission lines

**optical filters**

- GS electromagnetic wave filters
  - . **optical filters**
  - . . birefringent filters
  - . . infrared filters
  - . . ultraviolet filters
- RT adaptive filters
  - apodization
  - bandpass filters
  - bandstop filters
  - Bragg gratings
  - diaphragms (mechanics)
  - didymium
  - electric filters
  - filtergrams
- ∞ filters
- ∞ gratings
  - gratings (spectra)
  - high pass filters
  - lenses
  - low pass filters
  - optical relay systems
- ∞ optics
  - photographic equipment
  - photographic film
  - Rowland circles
  - sunglasses
  - transmission
  - tunable filters

**optical flow (image analysis)**

- (added May 1993)
- RT computer vision
  - image analysis
  - image processing
- ∞ optics
  - scene analysis
  - three dimensional motion

*optical generators*

- USE **laser cavities**

**optical gyroscopes**

- GS gyroscopes
  - . **optical gyroscopes**
  - optical equipment
  - . **optical gyroscopes**
- RT laser gyroscopes
- ∞ optics
  - Sagnac effect

**optical heterodyning**

- GS heterodyning
  - . **optical heterodyning**
- RT Doppler effect
  - light modulation

## optical illusion

- ∞ optics
- optical illusion**
  - GS psychological effects
    - . illusions
    - . . . **optical illusion**
    - . . . elevator illusion
  - RT moon illusion
- ∞ optics

*optical images*  
USE **images**

**optical interconnects**  
(added June 1998)  
GS **optical interconnects**

- . free-space optical interconnects

- RT connectors
- electric connectors
- integrated optics
- optical computers
- optical switching
- optoelectronic devices
- photonics

*optical maser modulation*  
USE **light modulation**

*optical masers*  
USE **lasers**

**optical materials**  
(added September 1988)  
GS **optical materials**

- . glass fibers
- . optical data storage materials
- . optical fibers
- . . . scintillating fibers

- RT aspheric optics
- chromophores
- glass
- infrared windows
- lenses
- ∞ materials
- materials selection
- mirrors
- optical coatings
- windows (apertures)

**optical measurement**  
SN (MEASUREMENTS OF OPTICAL PROPERTIES, QUANTITIES OR CONDITIONS)

GS **optical measurement**

- . colorimetry
- . optometry
- . photometry
- . . . astronomical photometry
- . . . stellar spectrophotometry
- . . . electrophotometry
- . . . infrared photometry
- . . . spectrophotometry
- . . . stellar spectrophotometry
- . . . telephotometry
- . . . ultraviolet photometry
- . . . visual photometry
- . polarimetry
- . . . astronomical polarimetry

- RT chemical analysis
- collimators
- densitometers
- diffractometers
- electro-optical photography
- ellipsometry
- emissivity
- etalons
- Faraday effect
- gamma ray spectrometers
- geodimeters
- geometrical optics
- grazing incidence
- in situ measurement
- infrared interferometers
- interferometers
- light (visible radiation)
- ∞ measurement
- microdensitometers
- modulation transfer function
- nephelometers
- nonintrusive measurement
- ∞ optics

- phase contrast
- photographic measurement
- photometers
- photothermal deflection spectroscopy
- polarimeters
- pressure sensitive paints
- ray tracing
- reflectance
- reflectometers
- refractometers
- Ronchi test
- spectral signatures
- spectrometers
- spectrophotometers
- stroboscopes

**optical measuring instruments**  
SN (INSTRUMENTS UTILIZING OPTICAL PRINCIPLES FOR MEASUREMENT)

UF *optical sensors*

GS measuring instruments

- . **optical measuring instruments**
- . . cathetometers
- . . diffractometers
- . . Ebert spectrometers
- . . ellipsometers
- . . etalons
- . . geodimeters
- . . haploscopes
- . . infrared spectrometers
- . . . filter wheel infrared spectrometers
- . . light scattering meters
- . . microdensitometers
- . . nephelometers
- . . oculometers
- . . optical pyrometers
- . . optical range finders
- . . . laser range finders
- . . photogoniometers
- . . photometers
- . . . electrophotometers
- . . . ultraviolet spectrometers
- . . . . high dispersion spectrographs
- . . . . Total Ozone Mapping Spectrometer
- . . . quantum well infrared photodetectors
- . . . ultraviolet spectrophotometers
- . . polarimeters
- . . reflectometers
- . . . microwave reflectometers
- . . refractometers
- . . sextants
- . . spectrophotometers
- . . . infrared spectrophotometers
- . . . ultraviolet spectrophotometers
- . . transits
- . . . theodolites
- . . . . cinetheodolites
- . . . transmissometers

- optical equipment
- . **optical measuring instruments**
- . . cathetometers
- . . diffractometers
- . . Ebert spectrometers
- . . ellipsometers
- . . etalons
- . . geodimeters
- . . haploscopes
- . . infrared spectrometers
- . . . filter wheel infrared spectrometers
- . . light scattering meters
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- . . . microwave reflectometers
- . . refractometers
- . . sextants
- . . spectrophotometers
- . . . infrared spectrophotometers
- . . . ultraviolet spectrophotometers
- . . transits
- . . . theodolites
- . . . . cinetheodolites
- . . transmissometers

RT absorption spectroscopy

- cinespectrographs
- colorimetry
- densitometers
- Fabry-Perot spectrometers
- faint object camera
- goniometers
- guidance sensors
- infrared interferometers
- interferometers
- laser doppler velocimeters
- Mach-Zehnder interferometers
- microscopes
- Miros system
- monochromators
- multispectral tracking telescopes
- optical bistability

- ∞ optics
- optogalvanic spectroscopy
- periscopes
- polarimetry
- polariscopes
- radiation measuring instruments
- reflecting telescopes
- refracting telescopes
- self focusing
- Senarmont polariscopes
- solar instruments
- telephotometry
- telescopes

**optical memory (data storage)**  
GS memory (computers)

- . **optical memory (data storage)**

- RT associative memory
- CD-ROM
- coherent light
- computer storage devices
- ∞ data
- holography
- lasers
- optical bistability
- optical computers
- optical data storage materials
- optical disks
- ∞ optics
- video disks

*optical MEMS*  
(added December 2005)  
USE **microoptoelectromechanical systems**

*optical methods*  
USE **optics**

**optical microscopes**  
GS microscopes

- . **optical microscopes**
- optical equipment
- . **optical microscopes**

- RT electron microscopes
- ∞ optics

*optical modulation*  
USE **light modulation**

**optical paths**  
DEF Lines of sight or the paths followed by rays of light through optical systems.- RT diffraction paths
- geometrical optics
- holographic optical elements
- multipath transmission
- ∞ optics
- ∞ paths
- phase contrast
- photon beams
- Sagnac effect
- underwater optics

- Voigt effect
- wave dispersion
- optical polarization**
  - RT circular polarization
  - linear polarization
  - optical properties
  - ∞ optics
  - ∞ polarization
    - polarization modulation
    - polarized light
    - polarizers
    - polarography
- optical properties**
  - SN (INCLUDES PROPERTIES AND EFFECTS OF VISIBLE, INFRARED AND ULTRAVIOLET ELECTROMAGNETIC WAVES)
  - GS electromagnetic properties
    - . **optical properties**
      - . . . absorptance
      - . . . absorptivity
      - . . . birefringence
      - . . . Kerr electrooptical effect
      - . . . brightness
      - . . . sky brightness
      - . . . brightness distribution
      - . . . color
      - . . . iridescence
      - . . . stellar color
      - . . . water color
      - . . . dichroism
      - . . . luminosity
      - . . . stellar luminosity
      - . . . opacity
      - . . . optical bistability
      - . . . optical reflection
      - . . . phosphorescence
      - . . . photoconductivity
      - . . . photoviscoelasticity
      - . . . radiance
      - . . . reflectance
      - . . . bidirectional reflectance
      - . . . spectral reflectance
      - . . . refractivity
      - . . . photorefractivity
      - . . . stigmatism
      - . . . translucence
      - . . . transmissivity
      - . . . transmittance
      - . . . transparency
      - . . . turbidity
  - RT acousto-optics
  - albedo
  - birefringent filters
  - clarity
  - coefficients
  - coherent radiation
  - cross polarization
  - darkness
  - diffraction
  - electrical properties
  - electromagnetic absorption
  - emittance
  - excitons
  - Faraday effect
  - geometrical optics
  - glare
  - glass
  - gradient index optics
  - haze
  - infrared absorption
  - isotropy
  - Kerr magneto-optical effect
  - light (visible radiation)
  - light transmission
  - lumens
  - luminance
  - lunar albedo
  - metallic glasses
  - numerical aperture
  - opalescence
  - optical polarization
  - ∞ optics
  - ∞ orientation
  - photoelectricity
  - photons
  - phototropism
  - physical optics
  - ∞ physical properties
    - polarization (waves)
    - ∞ properties
    - ∞ solid state physics
    - surface properties
    - thermochromatic materials
    - thermodynamic properties
    - visibility
    - wave dispersion
- optical pumping**
  - GS **optical pumping**
    - . laser pumping
  - RT electron pumping
  - electron-hole drops
  - excimer lasers
  - fiber lasers
  - gamma ray lasers
  - glass lasers
  - HCN lasers
  - krypton fluoride lasers
  - laser cooling
  - laser propulsion
  - lasers
    - maser pumping
    - metal vapor lasers
    - neodymium lasers
    - nuclear pumped lasers
    - nuclear pumping
  - ∞ optics
    - pulse repetition rate
  - ∞ pumping
    - rare gas-halide lasers
    - solar-pumped lasers
    - stimulated emission
    - stimulated emission devices
- optical pyrometers**
  - DEF Devices for measuring the temperature of an incandescent radiating body by comparing its brightness for a selected wavelength interval within the visible spectrum with that of a standard source; a monochromatic radiation pyrometer.
    - GS measuring instruments
      - . optical measuring instruments
      - . . **optical pyrometers**
        - . temperature measuring instruments
        - . . **optical pyrometers**
          - optical equipment
          - . optical measuring instruments
          - . . **optical pyrometers**
    - RT ∞ optics
      - radiation pyrometers
- optical radar**
  - UF *laser radar*
  - lidar*
  - GS radar
    - . **optical radar**
      - . . differential absorption lidar
  - RT infrared radar
  - laser altimeters
  - laser applications
  - optical countermeasures
  - ∞ optics
    - over-the-horizon radar
    - radar detection
- optical range finders**
  - GS measuring instruments
    - . distance measuring equipment
    - . . range finders
      - . . . **optical range finders**
        - . . . . laser range finders
      - . optical measuring instruments
      - . . **optical range finders**
        - . . . laser range finders
      - optical equipment
        - . optical measuring instruments
        - . . **optical range finders**
          - . . . laser range finders
    - RT lunar ranging
      - ∞ optics
  - optical reflection**
    - GS electromagnetic properties
      - . optical properties
      - . . **optical reflection**
        - reflection
    - ∞ **optical reflection**
      - antireflection coatings
      - electromagnetic absorption
      - geometrical optics
      - incident radiation
      - infrared reflection
      - light transmission
      - ∞ optics
        - reflectance
        - reflected waves
        - spread reflection
  - optical relay systems**
    - DEF Systems using photocouplers in which the output device is a light sensitive switch that provides the same on and off operations as the contacts of a relay.
      - RT electro-optics
        - imaging techniques
        - laser applications
        - optical data processing
        - optical filters
        - optical resonators
        - optical switching
      - ∞ optics
        - pattern recognition
      - ∞ systems
  - optical resonance**
    - GS emission
      - . light emission
      - . . luminescence
      - . . . **optical resonance**
        - resonance
        - . **optical resonance**
          - nuclear pumped lasers
    - RT nuclear pumped lasers
      - ∞ optics
        - plasma radiation
        - plasma spectra
        - resonance lines
        - spectrum analysis
  - optical resonators**
    - GS resonators
      - . **optical resonators**
    - RT field mode theory
    - laser modes
    - laser outputs
    - lasers
    - light modulation
    - mirrors
    - optical relay systems
    - ∞ optics
  - optical satellite tracking program**
    - RT ∞ optics
      - satellite tracking
  - optical scanners**
    - DEF A light source and phototube combined as a single unit for scanning moving strips of paper or other materials in photoelectric side-register control systems.
      - GS optical equipment
        - . **optical scanners**
          - . . flying spot scanners
          - . . multispectral band scanners
          - . . . thematic mappers (LANDSAT)
        - scanners
          - . **optical scanners**
            - . . flying spot scanners
            - . . multispectral band scanners
            - . . . thematic mappers (LANDSAT)
        - RT character recognition
          - data acquisition
          - monitors
        - ∞ optics
          - photon beams
          - readers
          - television cameras
    - optical sensors*
      - USE **optical measuring instruments**
    - optical signals*
      - USE **optical communication**
    - optical slant range**
      - DEF The horizontal distance in a homogeneous atmosphere for which the attenuation is



## optical switching

the same as that actually encountered along the true oblique path.

- GS distance
- . **optical slant range**
- RT ∞ optics
- radar range

*optical spectrum*

- USE **light (visible radiation) spectra**

### optical switching

- UF *electro-optical switching*
- optoelectronic switching*
- photonic switching*
- GS switching
- . **optical switching**
- RT acousto-optics
- asynchronous transfer mode
- electro-optics
- free-space optical interconnects
- integrated optics
- light modulation
- magneto-optics
- optical bistability
- optical interconnects
- optical relay systems
- optoelectronic devices
- photonics
- semiconductor lasers
- switching circuits

### optical thickness

DEF A measure of the cumulative attenuation of electromagnetic radiation in transit through a medium. In calculations of the transfer of radiant energy, the mass of a given absorbing or emitting material lying in a vertical column of unit cross sectional area and extending between two specific levels. Used for optical depth.

- UF *optical depth*
- RT antireflection coatings
- Fermat principle
- ∞ optics
- refractivity
- thickness

### optical tracking

- UF *visual tracking*
- GS tracking (position)
- . **optical tracking**
- RT ballistic cameras
- boresight error
- boresights
- compensatory tracking
- Global Tracking Network
- infrared tracking
- minitrack system
- multiple target tracking
- multispectral tracking telescopes
- oculometers
- ∞ optics
- photographic tracking
- range and range rate tracking
- space detection and tracking system
- spacecraft tracking
- STDN (network)
- visual observation

### optical transfer function

- UF *OTF*
- GS functions (mathematics)
- . transfer functions
- . . **optical transfer function**
- RT adaptive optics
- cost analysis
- figure of merit
- imaging techniques
- modulation transfer function
- ∞ optics
- ∞ performance
- spaceborne telescopes
- system effectiveness
- systems analysis
- systems engineering
- telescopes

### optical transition

- RT electron transitions
- emission spectra

- Franck-Condon principle
- lasing
- luminescence
- ∞ optics

### optical waveguides

DEF Any device or component that guides optical energy.

- GS waveguides
- . **optical waveguides**
- . . optical fibers
- . . . scintillating fibers
- RT corrugated waveguides
- dielectric waveguides
- integrated optics
- laser outputs
- light beams
- light transmission
- optical bistability
- ∞ optics
- photonics
- photorefractivity
- waveguide lasers

### ∞ optics

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF Branch of physical science concerned with the transmission, generation, manipulation, and detection of electromagnetic radiation in the wavelength range from vacuum ultraviolet to the far infrared.

- UF *optical methods*
- RT acousto-optics
- adaptive optics
- angular resolution
- aspheric optics
- asphericity
- astigmatism
- atmospheric optics
- atom optics
- Cassegrain optics
- caustics (optics)
- chromophores
- crystal optics
- defocusing
- diffraction patterns
- diffraction propagation
- diffraction optics
- electron optics
- electro-optical effect
- electro-optical photography
- electro-optics
- fiber optics
- foci
- Fresnel lenses
- geometrical optics
- gradient index optics
- Huygens principle
- images
- imaging techniques
- integrated optics
- ion optics
- laser cavities
- lasers
- lens design
- lenses
- light (visible radiation)
- light amplifiers
- light emission
- light modulation
- magneto-optics
- mirrors
- nonlinear optics
- optical activity
- optical communication
- optical correction procedure
- optical countermeasures
- optical coupling
- optical data processing
- optical data storage materials
- optical density
- optical depolarization
- optical emission spectroscopy
- optical equipment
- optical filters
- optical flow (image analysis)
- optical gyroscopes
- optical heterodyning

- optical illusion
- optical measurement
- optical measuring instruments
- optical memory (data storage)
- optical microscopes
- optical paths
- optical polarization
- optical properties
- optical pumping
- optical pyrometers
- optical radar
- optical range finders
- optical reflection
- optical relay systems
- optical resonance
- optical resonators
- optical satellite tracking program
- optical scanners
- optical slant range
- optical thickness
- optical tracking
- optical transfer function
- optical transition
- optical waveguides
- parallax
- photics
- photoelastic analysis
- physical optics
- prefocusing
- quantum optics
- reflection
- resolution
- scatter plates (optics)
- ∞ science
- Snells law
- spectroscopy
- squeezed states (quantum theory)
- Starlab
- underwater optics
- x ray optics

### optimal control

- UF *optimum control*
- GS automatic control
- . **optimal control**
- . . H-2 control
- . . H-infinity control
- . . linear quadratic Gaussian control
- . . time optimal control
- optimization
- . **optimal control**
- . . H-2 control
- . . H-infinity control
- . . linear quadratic Gaussian control
- . . time optimal control
- RT adaptive control
- ∞ control
- control systems design
- control theory
- differential games
- feedback control
- feedforward control
- genetic algorithms
- inventory controls
- Kalman-Schmidt filtering
- linear quadratic regulator
- model reference adaptive control
- multivariable control
- parameter identification
- pursuit-evasion games
- tracking problem
- trajectory control
- zero sum games

### optimization

DEF The procedure used in the design of a system to maximize or minimize some performance index. May entail the selection of a component, a principle of operation, or a technique.

- UF *minimization*
- reduction (mathematics)*
- GS **optimization**
- . flight optimization
- . genetic algorithms
- . linear quadratic regulator
- . . linear quadratic Gaussian control
- . mathematical programming
- . . dynamic programming

- . . linear programming
- . . nonlinear programming
- . . quadratic programming
- . multidisciplinary design optimization
- . operations research
- . optimal control
  - . . H-2 control
  - . . H-infinity control
  - . . linear quadratic Gaussian control
  - . . time optimal control
- . design optimization
- . simplex method
- . trajectory optimization
- . shape optimization

RT ∞ applications of mathematics  
backpropagation (artificial intelligence)  
Bellman theory  
Bolza problems  
constraints  
correlation

∞ design  
design analysis  
differential calculus  
efficiency  
extremum values  
games  
gradients  
greedy algorithms  
Hessian matrices  
Kalman filters  
Kalman-Schmidt filtering  
Lagrange multipliers  
least squares method  
maxima  
minima  
parameter identification  
penalty function  
planning  
pontryagin principle  
quality control  
range (extremes)

∞ reduction  
scheduling  
sensitivity analysis  
simulated annealing  
static models  
steepest descent method  
stopping  
system identification  
Taguchi methods  
trajectory control  
Wiener filtering

*optimum control*

USE **optimal control**

*optimum thrust programming*

USE **thrust programming**

## options

RT alternatives  
contracts  
selection  
site selection  
subcontracts

## optoelectronic devices

DEF Electronic devices combining optic and electric ports.

GS **optoelectronic devices**

- . light emitting diodes
- . photodiodes
- . phototransistors

RT electro-optics  
fiber optics  
free-space optical interconnects  
integrated circuits  
integrated optics  
microoptoelectromechanical systems  
optical interconnects  
optical switching  
photonics

*optoelectronic switching*

USE **optical switching**

## optogalvanic spectroscopy

DEF A method of obtaining absorption spectra of atomic and molecular species in flames and electrical discharges by measuring

voltage and current changes upon laser irradiation.

GS spectroscopy
 

- . absorption spectroscopy
- . . **optogalvanic spectroscopy**
- . optical emission spectroscopy
- . . laser spectroscopy
- . . . **optogalvanic spectroscopy**

 utilization
 

- . laser applications
- . . laser spectroscopy
- . . . **optogalvanic spectroscopy**

 RT flame spectroscopy  
Fraunhofer lines  
gas spectroscopy  
infrared spectroscopy  
molecular spectroscopy  
optical equipment  
optical measuring instruments  
Raman spectroscopy  
ultraviolet spectroscopy  
volt-ampere characteristics

## optometry

GS optical measurement
 

- . **optometry**

 RT anastigmatism  
blindness  
eye (anatomy)  
haplosopes

∞ measurement  
medical science  
vision

## oral hygiene

GS hygiene
 

- . **oral hygiene**

 RT cleanliness  
dentistry  
health  
public health  
teeth  
tooth diseases

## oratory

USE **public speaking**

## ORBIS

UF *orbiting radio beacon ionospheric sounder*

GS artificial satellites
 

- . scientific satellites
- . . **ORBIS**
- . . . ORBIS CAL satellite

 RT ionospheric propagation  
ionospheric sounding  
radio beacons

## ORBIS CAL satellite

GS artificial satellites
 

- . gravity gradient satellites
- . . **ORBIS CAL satellite**
- . . scientific satellites
- . . . ORBIS
- . . . **ORBIS CAL satellite**

 RT ionospheric propagation  
ionospheric sounding  
radio beacons

## orbit calculation

UF *satellite orbit calculation*

GS computation
 

- . **orbit calculation**
- . . minimum variance orbit determination
- . . orbital position estimation

 orbit determination
 

- . **orbit calculation**
- . . minimum variance orbit determination
- . . orbital position estimation

 RT flight mechanics  
Goddard Trajectory Determination System  
orbital elements  
orbital mechanics  
orbital resonances (celestial mechanics)

quadratures

## orbit decay

RT aerodynamic drag  
atmospheric entry  
flight mechanics  
orbital mechanics  
satellite lifetime  
spacecraft breakup

## orbit determination

(added December 1998)

GS **orbit determination**

- . airborne range and orbit determination
- . orbit calculation
- . . minimum variance orbit determination
- . . orbital position estimation

 RT Global Positioning System  
position errors  
satellite tracking  
space navigation  
spacecraft control  
spacecraft position indicators

*orbit equations*

USE **orbital mechanics**

## orbit insertion

(added January 1991)

DEF The process by which a spacecraft enters into a desired orbit around a celestial body.

GS insertion
 

- . **orbit insertion**

 RT ascent trajectories  
orbital maneuvers  
orbital mechanics  
payload delivery (STS)  
satellite orbits  
spacecraft launching  
spacecraft maneuvers  
spacecraft orbits  
transfer orbits

## Orbit Maneuvering Engine (Space Shuttle)

UF *OME*

GS engines
 

- . rocket engines
- . . microrocket engines
- . . . **Orbit Maneuvering Engine (Space Shuttle)**

 RT Aeromaneuvering Orbit to Orbit Shuttle  
orbital maneuvers  
space shuttles

## orbit perturbation

UF *evection*

GS perturbation
 

- . **orbit perturbation**
- . . satellite perturbation

 RT drift rate  
long term effects  
lunar effects  
orbital elements  
orbital mechanics  
orbital resonances (celestial mechanics)  
perturbation theory  
Schach effect  
vinti theory

## orbit spectrum utilization

DEF Telecommunication techniques in spectrum conservation for reducing user costs.

RT communication satellites  
frequency assignment  
radio relay systems  
satellite orbits  
systems engineering  
television systems

## orbit transfer vehicles

DEF Concept of propulsive (velocity producing) rockets or stages for use with crew transfer modules, manned sortie modules, or other payloads. Used for OTV.

## orbital assembly

UF *OTV*  
GS **orbit transfer vehicles**  
. Aeromaneuvering Orbit to Orbit Shuttle  
RT Inertial Upper Stage  
orbital maneuvering vehicles  
orbital servicing  
payload delivery (STS)  
payload deployment & retrieval system  
payload retrieval (STS)  
space shuttles  
space transportation  
space tugs  
∞ spacecraft  
∞ vehicles

**orbital assembly**  
UF *construction in space*  
*spacecraft orbital assembly*  
GS assembling  
. **orbital assembly**  
RT Crew Equipment Translation Aid (ISS)  
expandable structures  
inflatable spacecraft  
self erecting devices  
space erectable structures  
Space Operations Center (NASA)  
Space Station Mobile Servicing System  
space station modules  
space station structures  
spacecraft modules  
spacecraft structures

*orbital breakup*  
USE **spacecraft breakup**

**orbital elements**  
DEF A set of seven parameters defining the orbit of a body attracted by a central, inverse square force.  
RT apsides  
∞ elements  
orbit calculation  
orbit perturbation  
orbits  
perihelions  
perturbation theory

*Orbital Flight Test 1 (shuttle)*  
USE **Space Transportation System 1 flight**

*Orbital Flight Test 2 (shuttle)*  
USE **Space Transportation System 2 flight**

*Orbital Flight Test 3 (shuttle)*  
USE **Space Transportation System 3 flight**

*Orbital Flight Test 4 (shuttle)*  
USE **Space Transportation System 4 flight**

*orbital flight tests (shuttle)*  
USE **Space Transportation System flights**

**orbital launching**  
SN (LAUNCHING FROM AN ORBIT--EXCLUDES LAUNCHING INTO ORBIT FROM GROUND)  
GS launching  
. rocket launching  
. . **orbital launching**  
RT interplanetary trajectories  
lunar launch  
payload delivery (STS)  
spacecraft launching  
transfer orbits

**orbital lifetime**  
DEF The predicted lifetime of a satellite in orbit, usually based on such criteria as solar flux density, atmospheric density, the lessening of the eccentricity of elliptical orbits, or the gravitational effects of the sun or the moon.  
RT attitude control

Earth orbits two body problem

**orbital maneuvering vehicles**  
RT orbit transfer vehicles  
orbital servicing  
power modules (STS)  
remotely piloted vehicles  
∞ spacecraft

**orbital maneuvers**  
GS maneuvers  
. **orbital maneuvers**  
. . . orbital rendezvous  
. . . Earth orbital rendezvous  
. . . lunar orbital rendezvous  
RT formation flying  
orbit insertion  
Orbit Maneuvering Engine (Space Shuttle)  
space navigation  
space shuttles

**orbital mechanics**  
UF *orbit equations*  
GS mechanics (physics)  
. classical mechanics  
. . space mechanics  
. . . **orbital mechanics**  
. . . . Kepler laws  
. . . . minimum variance orbit determination  
RT Aeromaneuvering Orbit to Orbit Shuttle  
apsides  
astrodynamics  
celestial mechanics  
circular orbits  
drift rate  
Earth orbital rendezvous  
Earth orbits  
Earth-Mars trajectories  
Earth-Mercury trajectories  
Earth-Moon system  
elliptical orbits  
equatorial orbits  
flight mechanics  
flight optimization  
Goddard Trajectory Determination System  
Hansen lunar theory  
Hill lunar theory  
Hill method  
interplanetary trajectories  
interplanetary transfer orbits  
Lagrangian equilibrium points  
lunar orbital rendezvous  
lunar orbits  
many body problem  
moon-Earth trajectories  
orbit calculation  
orbit decay  
orbit insertion  
orbit perturbation  
orbital resonances (celestial mechanics)  
orbits  
parking orbits  
perturbation  
planetary landing  
Poynting-Robertson effect  
quadratures  
rendezvous  
rendezvous trajectories  
retrograde orbits  
round trip trajectories  
satellite orbits  
satellite perturbation  
space navigation  
spacecraft orbits  
stationkeeping  
swingby technique  
thrust programming  
trajectory analysis  
transearth injection  
transfer orbits  
translunar injection  
twenty-four hour orbits

*orbital motion*  
USE **orbits**

**orbital position estimation**  
GS computation  
. orbit calculation  
. . **orbital position estimation**  
estimating  
. **orbital position estimation**  
orbit determination  
. orbit calculation  
. . **orbital position estimation**  
celestial sphere  
RT Goddard Trajectory Determination System  
navigation  
∞ orientation  
position (location)  
position errors  
∞ range  
satellite orbits  
spacecraft orbits  
spacecraft position indicators  
state estimation

**orbital rendezvous**  
UF *satellite rendezvous*  
GS maneuvers  
. orbital maneuvers  
. . **orbital rendezvous**  
. . . Earth orbital rendezvous  
. . . lunar orbital rendezvous  
rendezvous  
. space rendezvous  
. . **orbital rendezvous**  
. . . Earth orbital rendezvous  
. . . lunar orbital rendezvous  
RT Atlas launch vehicles  
autonomous docking  
multiple docking adapters  
payload retrieval (STS)  
rendezvous guidance  
rendezvous spacecraft  
rendezvous trajectories  
spacecraft docking  
spacecraft trajectories  
tethering

**orbital resonances (celestial mechanics)**  
DEF Systems of two or more satellites (including planets) that orbit the same primary and whose orbital mean motions are in a ratio of small whole numbers.

GS resonance  
. **orbital resonances (celestial mechanics)**

RT astrodynamics  
celestial mechanics  
gravitational effects  
libration  
librational motion  
orbit calculation  
orbit perturbation  
orbital mechanics  
oscillations  
planetary orbits  
planetary systems  
satellite orbits  
solar orbits

**orbital servicing**  
DEF The replenishing of propellants, pressurants, coolants, and the replacement of modules and experiments, during some phase of a spacecraft flight to extend the mission and lifetime, or change the payloads.

UF *satellite repair*  
RT Columbus space station  
large space structures  
man tended free flyers  
manned maneuvering units  
orbit transfer vehicles  
orbital maneuvering vehicles  
payload transfer  
Space Operations Center (NASA)  
space platforms  
Space Shuttle payloads  
Space Station Freedom

- space stations
  - space transportation system
  - space tugs
  - telerobotics
- orbital shots**
- RT ∞ shot
  - spacecraft launching
- orbital simulators*
- USE **space simulators**
- orbital space tests**
- RT CRRES (satellite)
  - environmental tests
  - large space structures
  - space mechanics
  - space stations
  - structural analysis
  - ∞ tests
- Orbital Test Satellite (ESA)*
- USE **OTS (ESA)**
- orbital transfer*
- USE **transfer orbits**
- orbital velocity**
- DEF The average velocity at which an Earth satellite or other orbiting body travel around its primary. The velocity of such a body at any given point in its orbit, i.e., orbital velocity at the apogee is less than at the perigee.
  - GS rates (per time)
    - . **orbital velocity**
    - velocity
    - . **orbital velocity**
  - RT angular velocity
  - escape velocity
  - ∞ hypervelocity
  - velocity errors
- orbital workers**
- GS personnel
    - . flying personnel
    - . . . astronauts
    - . . . **orbital workers**
  - RT astronaut locomotion
  - extravehicular activity
  - space maintenance
  - space tools
  - work capacity
- orbital workshops**
- GS artificial satellites
    - . **orbital workshops**
    - . . Saturn workshops
    - . . . Saturn 1 workshop
    - . . . Saturn 5 workshop
    - . . Skylab 1
    - . . Skylab 2
    - . . Skylab 3
    - . . Skylab 4
    - manned spacecraft
    - . **orbital workshops**
    - . . Saturn workshops
    - . . . Saturn 1 workshop
    - . . . Saturn 5 workshop
    - . . Skylab 1
    - . . Skylab 2
    - . . Skylab 3
    - . . Skylab 4
  - RT Apollo extension system
  - containerless melts
  - manned orbital laboratories
  - Skylab program
  - space laboratories
  - space processing
  - space stations
- orbitals**
- GS **orbitals**
    - . electron orbitals
    - . molecular orbitals
    - . Slater orbitals
  - RT Jahn-Teller effect
  - orbits
- Schwarzschild metric
- Orbiting Astronomical Observatory*
- USE **OAO**
- Orbiting Carbon Observatory (OCO)**
- (added April 2009)
- DEF Observatory and related mission designed to make precise, time-dependent global measurements of atmospheric carbon dioxide from an Earth orbiting satellite. On February 24, 2009, OCO failed to reach orbit.
- GS artificial satellites
    - . scientific satellites
    - . . **Orbiting Carbon Observatory (OCO)**
  - RT atmospheric composition
  - carbon dioxide concentration
  - climate change
  - environmental monitoring
  - greenhouse effect
  - remote sensing
- orbiting dipoles**
- GS electric charge
    - . electric dipoles
    - . . **orbiting dipoles**
  - RT communication equipment
  - ∞ dipoles
- Orbiting Frog Otolith**
- GS artificial satellites
    - . biosatellites
    - . . **Orbiting Frog Otolith**
    - spaceborne experiments
    - . **Orbiting Frog Otolith**
  - RT biological effects
  - biometrics
  - biotelemetry
  - instrument packages
  - international cooperation
  - Italian space program
  - otolith organs
- Orbiting Geophysical Observatory*
- USE **OGO**
- orbiting lunar stations**
- GS artificial satellites
    - . lunar satellites
    - . . **orbiting lunar stations**
    - . space stations
    - . . **orbiting lunar stations**
    - lunar spacecraft
    - . lunar satellites
    - . . **orbiting lunar stations**
    - stations
    - . space stations
    - . . **orbiting lunar stations**
  - RT lunar bases
  - ∞ spacecraft
- orbiting radio beacon ionospheric sounder*
- USE **ORBIS**
- Orbiting Solar Observatory*
- USE **OSO**
- orbitrons**
- RT electron clouds
  - electron tubes
  - ionization gages
  - space charge
  - vacuum gages
- orbits**
- DEF The paths of bodies or particles under the influence of a gravitational or other force. Used for orbital motion and periodic orbits.
  - UF *orbital motion*
  - periodic orbits*
  - GS **orbits**
    - . circular orbits
    - . . stationary orbits
    - . Earth orbits
    - . . geosynchronous orbits
    - . . low Earth orbits
    - . . twenty-four hour orbits
    - . eccentric orbits
    - . elliptical orbits
- . . transfer orbits
  - . . . interplanetary transfer orbits
  - . equatorial orbits
  - . . stationary orbits
  - . lunar orbits
  - . planetary orbits
  - . retrograde orbits
  - . solar orbits
  - . spacecraft orbits
  - . . satellite orbits
  - . . . geosynchronous orbits
  - . . . parking orbits
  - . . . stationary orbits
  - . . . twenty-four hour orbits
  - . transfer orbits
  - . . interplanetary transfer orbits
  - . polar orbits
  - . stellar orbits
  - . Trojan orbits
- RT airborne range and orbit determination
- apexes
  - aphelions
  - apogees
  - artificial satellites
  - astrodynamics
  - celestial bodies
  - celestial mechanics
  - ∞ conjunction
  - Earth-Venus trajectories
  - ephemerides
  - flight optimization
  - flight paths
  - four body problem
  - ground tracks
  - ∞ inclination
  - interplanetary flight
  - lunar flight
  - many body problem
  - ∞ motion
  - orbital elements
  - orbital mechanics
  - orbitals
  - ∞ paths
  - perigees
  - perihelions
  - quadratures
  - Roche limit
  - satellite ground tracks
  - Schwarzschild metric
  - space flight
  - space navigation
  - spacecraft guidance
  - stationkeeping
  - suborbital flight
  - three body problem
  - trajectories
  - two body problem
- orchards**
- RT agriculture
  - blight
  - citrus trees
  - crop growth
  - crop vigor
  - ∞ crops
  - curing
  - farm crops
  - ∞ food
  - frost damage
  - fruits
  - irrigation
  - nuts (fruits)
  - plants (botany)
  - rural land use
  - silviculture
  - trees (plants)
- order-disorder transformations**
- RT antiphase boundaries
  - atomic structure
  - cluster variation method
  - crystal defects
  - crystal lattices
  - crystal structure
  - crystallography
  - holes (electron deficiencies)
  - metallography
  - microstructure

## ordnance

molecular structure  
phase transformations  
solid solutions  
∞ transformations

### ordnance

RT air to surface missiles  
ammunition  
armor  
ballistics  
explosives  
ground support equipment  
pyrotechnics  
tanks (combat vehicles)  
trajectories  
warfare  
weapon systems  
weapons

### Oregon

GS nations  
. United States  
. . **Oregon**  
RT Cascade Range (CA-OR-WA)  
Columbia River Basin (ID-OR-WA)

### ores

USE **minerals**

### organ culturing

(added August 2004)

DEF The growth of animal organs in vitro.  
GS culture techniques  
. **organ culturing**  
RT cell culturing  
clone cells  
culture media  
cultured cells  
microbiology  
tissue culturing  
tissue engineering

### organ weight

GS weight (mass)  
. **organ weight**

### organelles

GS **organelles**  
. chloroplasts  
. endoplasmic reticulum  
. . sarcoplasmic reticulum  
. lysosomes  
. mitochondria  
. nuclei (cytology)  
. plastids  
. ribosomes  
RT cells (biology)  
cytology  
cytoplasm

### organic aluminum compounds

GS aluminum compounds  
. **organic aluminum compounds**  
organometallic compounds  
. **organic aluminum compounds**  
RT ∞ chemical compounds  
∞ metal compounds

### organic boron compounds

GS boron compounds  
. **organic boron compounds**  
organic compounds  
. **organic boron compounds**  
RT ∞ chemical compounds

### organic charge transfer salts

DEF Organic compounds exhibiting temperature-dependent electrical, magnetic, and heat transfer properties.  
GS organic compounds  
. **organic charge transfer salts**  
RT charge transfer devices  
organic superconductors  
∞ salts  
semiconductors (materials)

### organic chemistry

DEF The study of the composition, properties, structure, and reactions of carbon-based compounds, specifically hydrocarbons and their

derivatives, and normally excluding carbon oxides, metallic carbonates, carbides, and carbon-sulfur and carbon-nitrogen compounds.

RT biochemistry  
∞ chemistry  
cracking (chemical engineering)  
cyclic compounds  
Diels-Alder reactions  
histochemical analysis  
methoxy systems  
optical activity  
physiochemistry

### organic compounds

#### GS organic compounds

. acetyl compounds  
. . acetylacetone  
. . acetylsalicylic acid  
. amino acids  
. . alanine  
. . . phenylalanine  
. . aspartic acid  
. . cysteine  
. . dopa  
. . folic acid  
. . glutamic acid  
. . glutamine  
. . glycine  
. . hippuric acid  
. . histidine  
. . leucine  
. . . norleucine  
. . lysine  
. . melanoidin  
. . methionine  
. . thyroxine  
. . tryptophan  
. . tyrosine  
. carbohydrates  
. . citric acid  
. . glucosides  
. . . nucleosides  
. . . . adenines  
. . . . guanosines  
. . polysaccharides  
. . cellulose  
. . . Fortisan (trademark)  
. . chitin  
. . dextrans  
. . . glyco gens  
. . . starches  
. . sugars  
. . . dextrans  
. . . inositols  
. . . lactose  
. . . mannitol  
. . . monosaccharides  
. . . sucrose  
. . . . hexoses  
. . . . . galactose  
. . . . . glucose  
. . . . . pentose  
. . . . . ribose  
. . . . . xylose  
. . carboxylic acids  
. . acrylic acid  
. . alanine  
. . . phenylalanine  
. . aspartic acid  
. . citric acid  
. . dicarboxylic acids  
. . fatty acids  
. . . acetic acid  
. . . . ethylenediaminetetraacetic acids  
. . . . . iodoacetic acid  
. . . . . acetylsalicylic acid  
. . . . . benziic acid  
. . . . . benzoic acid  
. . . . . lipoic acid  
. . . . . oleic acid  
. . . . . palmitic acid  
. . . . . propionic acid  
. . . . . sebacic acid  
. . . . . valeric acid  
. . . . . abscisic acid  
. . . . . folic acid  
. . . . . formhydroxamic acid  
. . . . . formic acid  
. . Hexogenes (trademark)  
. . lactic acid  
. . lysine  
. . nicotinic acid  
. . oxalic acid  
. . oxamic acids  
. . tryptophan  
. . choline  
. . coenzymes  
. . . adenosine diphosphate  
. . . adenosine triphosphate  
. . . cyclic AMP  
. . . glutathione  
. . . thiamine  
. . cyclic compounds  
. . cyclic hydrocarbons  
. . . anthracene  
. . . benzene  
. . . chlorobenzenes  
. . . . colchicine  
. . . . cyclobutane  
. . . . cyclohexane  
. . . . cyclopropane  
. . . . durene  
. . . . indene  
. . . . menthol  
. . . . naphthalene  
. . . . naphthenes  
. . . . polycyclic aromatic hydrocarbons  
. . . . heterocyclic compounds  
. . . . . acriflavine  
. . . . . adenosines  
. . . . . . adenosine diphosphate  
. . . . . . . adenosine monophosphate  
. . . . . . . adenosine triphosphate  
. . . . . . . cyclic AMP  
. . . . . alkaloids  
. . . . . . atropine  
. . . . . . . betaines  
. . . . . . . caffeine  
. . . . . . . colchicine  
. . . . . . . ergotamine  
. . . . . . . hyoscine  
. . . . . . . lysergine  
. . . . . . . morphine  
. . . . . . . nicotinamide  
. . . . . . . nicotine  
. . . . . . . pilocarpine  
. . . . . . . reserpine  
. . . . . . . strychnine  
. . . . . . . tropyil compounds  
. . . . . anisole  
. . . . . ascorbic acid  
. . . . . azines  
. . . . . . cyanurates  
. . . . . . . cyanuric acid  
. . . . . . . meclizine  
. . . . . . . methylene blue  
. . . . . . . phenothiazines  
. . . . . azoles  
. . . . . . acetazolamide  
. . . . . . . oxazole  
. . . . . . . pyrroles  
. . . . . . . carbazoles  
. . . . . . . azulene  
. . . . . . . bioflavonoids  
. . . . . . . biotin  
. . . . . . . carnitine  
. . . . . . . cyanocobalamin  
. . . . . . . cytidylic acid  
. . . . . . . dimenhydrinate  
. . . . . . . endrin  
. . . . . . . ethylene oxide  
. . . . . . . folic acid  
. . . . . . . furans  
. . . . . . . tetrahydrofuran  
. . . . . . . guanethidine  
. . . . . . . HMX  
. . . . . . . nicotinic acid  
. . . . . . . phthalocyanin  
. . . . . . . phylloquinone  
. . . . . . . piperidine  
. . . . . . . promethazine  
. . . . . . . purines  
. . . . . . . . adenines  
. . . . . . . . . xanthines  
. . . . . . . . . . caffeine  
. . . . . . . . . . . guanines  
. . . . . . . . . . . uric acid  
. . . . . . . . . . . pyridines

. . . pyridoxine  
 . . . pyrimidines  
   . . . . alloxan  
   . . . . thymidine  
   . . . . thymine  
   . . . . uracil  
 . . . indoles  
 . . . RDX  
 . . . retinene  
 . . . riboflavin  
 . . . tetracyclines  
 . . . tetrazoles  
 . . . thiamine  
 . . . thiazine (trademark)  
 . . . thiophenes  
 . . . tocopherol  
 . . . trimethadione  
 . . . tryptamines  
   . . . . tryptophan  
   . . . . melatonin  
   . . . . . serotonin  
 . . . imidazoles  
 . . . rhodamine  
 . diethyl compounds  
   . diethyl ether  
   . diethyl hydrogen phosphite (DEHP)  
 . dimethyl compounds  
   . dimethylhydrazines  
 . fluorine organic compounds  
   . fluoroamines  
   . . . nitrofluoroamines  
   . . . trifluoroamine oxide  
   . fluorocarbons  
   . fluorohydrocarbons  
   . . carbon tetrafluoride  
   . . chlorofluoromethane  
   . . polytetrafluoroethylene  
   . . . teflon (trademark)  
   . fluoropolymers  
   . . polytetrafluoroethylene  
   . . . teflon (trademark)  
   . . . KEL-F  
   . . polyvinyl fluoride  
   . perfluoroalkane  
   . perfluoroguanidine  
   . hydrocarbons  
   . aliphatic hydrocarbons  
   . . alkanes  
   . . . . butanes  
   . . . . cetane  
   . . . . ethane  
   . . . . heptanes  
   . . . . methane  
   . . . . nitropropane  
   . . . . nonanes  
   . . . . octanes  
   . . . . paraffins  
   . . . . . ceresin  
   . . . . pentanes  
   . . . . . neopentane  
   . . . . propane  
   . . alkenes  
   . . . . butenes  
   . . . . ethylene  
   . . . . vinylidene  
   . . . . hexenes  
   . . . . propylene  
   . . . . trienes  
   . . alkynes  
   . . . . acetylene  
   . . . . oxyacetylene  
   . . dienes  
   . . . . butadiene  
   . . . . heptadiene  
   . . . . hexadiene  
   . . . . polybutadiene  
   . . . carotenoids  
   . . carotene  
   . . cubane  
   . . cyanoacetylene  
   . . cyclic hydrocarbons  
   . . . anthracene  
   . . . benzene  
   . . . chlorobenzenes  
   . . . colchicine  
   . . . cyclobutane  
   . . . cyclohexane  
   . . . cyclopropane  
   . . . durene  
   . . . indene  
   . . . menthol  
   . . . naphthalene  
   . . . naphthenes  
   . . . polycyclic aromatic hydrocarbons  
   . . diphenyl compounds  
   . . . diphenyl hydantoin  
   . . fluorohydrocarbons  
   . . . carbon tetrafluoride  
   . . . chlorofluoromethane  
   . . . polytetrafluoroethylene  
   . . . . teflon (trademark)  
   . . mesitylene  
   . . methylene  
   . . methylidyne  
   . . natural gas  
   . . . liquefied natural gas  
   . . phenanthrene  
   . . pyrenes  
   . . quinoxalines  
   . . stilbene  
   . . toluene  
   . . triphenyls  
   . . xylene  
   . kerogen  
   . lead organic compounds  
   . . lead acetates  
   . lipids  
   . . calciferol  
   . . castor oil  
   . . fats  
   . . lipoproteins  
   . . phylloquinone  
   . . retinene  
   . . steroids  
   . . . cholesterol  
   . . . corticosteroids  
   . . . . aldosterone  
   . . . . hydroxycorticosteroid  
   . . . . . cortisone  
   . . . . glucocorticoids  
   . . . estrogens  
   . . prostaglandins  
   . . tocopherol  
   . nucleic acids  
   . . deoxyribonucleic acid  
   . . . complementary DNA  
   . . ribonucleic acids  
   . nucleotides  
   . . adenines  
   . . adenosines  
   . . . adenosine diphosphate  
   . . . adenosine monophosphate  
   . . . adenosine triphosphate  
   . . cyclic AMP  
   . . oligonucleotides  
   . . polynucleotides  
   . . pyridine nucleotides  
   . . uridylic acid  
   . organic boron compounds  
   . organic charge transfer salts  
   . organic germanium compounds  
   . organic liquids  
   . organic lithium compounds  
   . organic peroxides  
   . organic phosphorus compounds  
   . . phosphazene  
   . . phosphene  
   . . phosphonitriles  
   . . uridylic acid  
   . organic silicon compounds  
   . . triphenyl silicon  
   . organic sulfur compounds  
   . organic tin compounds  
   . pentanone  
   . peptides  
   . . polypeptides  
   . . . angiotensins  
   . . . glutathione  
   . . . hypertensin  
   . . vasopressins  
   . polynuclear organic compounds  
   . propargyl groups  
   . proteins  
   . . albumins  
   . . aspartates  
   . . calmodulin  
   . . elastin  
   . . enzymes  
   . . . aldolase  
   . . . amidase  
   . . . carbonic anhydrase  
   . . . catalase  
   . . . cholinesterase  
   . . . cytochromes  
   . . . dehydrogenases  
   . . . hexokinase  
   . . . lysozyme  
   . . . nuclease  
   . . . oxidase  
   . . . papain  
   . . . pepsin  
   . . . phosphatases  
   . . . protease  
   . . . renin  
   . . . thrombin  
   . . . trypsin  
   . . . fibrin  
   . . globulins  
   . . . fibrinogen  
   . . . gamma globulin  
   . . . hemoglobin  
   . . . carboxyhemoglobin  
   . . . oxyhemoglobin  
   . . . keratins  
   . . lipoproteins  
   . . luminescent proteins  
   . . melanin  
   . . myoglobin  
   . . myosins  
   . . osteocalcin  
   . . phytochrome  
   . . proteinoids  
   . . prothrombin  
   . . protoproteins  
   . . tumor suppressor proteins  
   . nitriles  
   . quinoline  
   . quinones  
   . volatile organic compounds  
   . . acetonitrile  
   . . acrylonitriles  
   . . . polyacrylonitrile  
   . . malononitrile  
   . . phosphonitriles  
   . . succinonitrile  
   . ethylene compounds  
   . . chloroethylene  
   . . . trichloroethylene  
   . . ethoxy ethylene  
   . . ethylene dihydrazine  
   . . ethylenediamine  
   . . ethylenediaminetetraacetic acids  
   . . succinonitrile  
   . amines  
   . . aminophylline  
   . . amphetamines  
   . . . methamphetamine  
   . . aniline  
   . . catecholamine  
   . . . epinephrine  
   . . . norepinephrine  
   . . cysteamine  
   . . diamines  
   . . . ethylenediamine  
   . . . guanidines  
   . . . . guanethidine  
   . . . . triaminoguanidinium azide  
   . . difluorourea  
   . . dimenhydrinate  
   . . dimethylhydrazines  
   . . diphenyl hydantoin  
   . . ergotamine  
   . . fluoroamines  
   . . . nitrofluoroamines  
   . . . trifluoroamine oxide  
   . . gallamine triethiodide  
   . . hexamethylenetetramine  
   . . histidine  
   . . hydroxylamine sulfate  
   . . hyoscine  
   . . . mecamlamine  
   . . melamine  
   . . methylene diamine  
   . . monoethanolamine (MEA)  
   . . nitroamines  
   . . nitrosamine  
   . . promethazine

## organic coolants

- . . tetrafluorohydrazine
- . . tetryl
- . . thiuronium
- . . trinitramine
- . . tryptamines
- . . . melatonin
- . . . serotonin
- . . acetylcholine
- RT alcohols
- aldehydes
- ∞ aliphatic compounds
- alkyl compounds
- ∞ aromatic compounds
- ∞ chemical compounds
- chemical evolution
- esters
- ethers
- hydroxyl compounds
- metabolites
- methoxy systems
- methyl compounds
- nitroso compounds
- organic superconductors
- organic wastes (fuel conversion)
- organometallic compounds
- ∞ salts

### organic coolants

- GS coolants
- . **organic coolants**

### organic cooled reactors

- UF *orgel reactor*
- GS nuclear reactors
- . liquid cooled reactors
- . . **organic cooled reactors**
- . . . experimental organic cooled reactors
- RT reactor design
- reactor technology

### organic fluorine compounds

- USE **fluorine organic compounds**

### organic germanium compounds

- GS germanium compounds
- . **organic germanium compounds**
- organic compounds
- . **organic germanium compounds**
- organometallic compounds
- . **organic germanium compounds**
- RT ∞ chemical compounds
- ∞ metal compounds

### organic lasers

- GS stimulated emission devices
- . lasers
- . . **organic lasers**
- . . . dye lasers
- RT carbon dioxide lasers
- carbon lasers
- chemical lasers
- gas lasers
- infrared lasers
- liquid lasers

### organic liquids

- GS liquids
- . **organic liquids**
- organic compounds
- . **organic liquids**
- RT pyruvates
- xanthic acids

### organic lithium compounds

- GS lithium compounds
- . **organic lithium compounds**
- organic compounds
- . **organic lithium compounds**
- organometallic compounds
- . **organic lithium compounds**
- RT ∞ chemical compounds
- ∞ metal compounds

### organic materials

- GS **organic materials**
- . peat
- RT biodegradability
- carbonaceous materials
- cork (materials)

- cotton fibers
- elastomers
- linen
- ∞ materials
- molds
- paper (material)
- phase change materials
- plastics
- ∞ polymers
- rosin
- rubber
- silk
- thermochromatic materials
- wood
- wool

### organic moderated reactors

- GS nuclear reactors
- . **organic moderated reactors**
- . . experimental organic cooled reactors

### organic nitrates

- GS esters
- . **organic nitrates**
- . . cellulose nitrate
- . . nitroforms
- . . . hydrazine nitroform
- . . nitroglycerin
- . . PETN
- nitrogen compounds
- . nitrates
- . . **organic nitrates**
- . . . cellulose nitrate
- . . . nitroforms
- . . . . hydrazine nitroform
- . . . nitroglycerin
- . . . PETN

### organic peroxides

- DEF Organic compounds containing radical groups combined with oxides in which two atoms of oxygen are linked together, e.g., diethyl peroxide.
- GS chalcogenides
- . oxides
- . . anhydrides
- . . peroxides
- . . . **organic peroxides**
- organic compounds
- . **organic peroxides**
- RT air pollution
- hydrocarbons
- inorganic peroxides

### organic phosphorus compounds

- GS organic compounds
- . **organic phosphorus compounds**
- . . phosphazene
- . . phosphene
- . . phosphonitriles
- . . uridylic acid
- phosphorus compounds
- . **organic phosphorus compounds**
- . . phosphazene
- . . phosphene
- . . phosphonitriles
- . . uridylic acid
- RT ∞ chemical compounds

### organic semiconductors

- GS semiconductors (materials)
- . **organic semiconductors**
- RT ∞ chemical compounds
- conducting polymers
- conductors
- organic superconductors
- semiconductor devices

### organic silicon compounds

- GS organic compounds
- . **organic silicon compounds**
- . . triphenyl silicon
- silicon compounds
- . **organic silicon compounds**
- . . triphenyl silicon

- RT ∞ chemical compounds

### organic solids

- DEF Solid materials composed of organic materials.
- GS solids
- . **organic solids**
- RT astronomical spectroscopy
- cosmic dust
- dissolved organic matter
- planetary atmospheres

### organic sulfur compounds

- GS organic compounds
- . **organic sulfur compounds**
- sulfur compounds
- . **organic sulfur compounds**
- RT ∞ chemical compounds

### organic superconductors

- (added May 1991)
- GS conductors
- . superconductors (materials)
- . . **organic superconductors**
- RT organic charge transfer salts
- organic compounds
- organic semiconductors

### organic tin compounds

- GS organic compounds
- . **organic tin compounds**
- organometallic compounds
- . **organic tin compounds**
- tin compounds
- . **organic tin compounds**
- RT ∞ chemical compounds
- ∞ metal compounds

### organic wastes (fuel conversion)

- RT ∞ conversion
- energy conversion
- garbage
- human wastes
- metabolic wastes
- organic compounds
- residues
- sewage
- sludge
- wastes

### organisms

- RT animals
- biomass
- carbon cycle
- deep scattering layers
- plants (botany)

### organizations

- UF *associations*
- GS **organizations**
- . European Space Agency
- . federations
- . . bureaus (organizations)
- . ISRO
- . North Atlantic Treaty Organization (NATO)
- . World Meteorological Organization
- RT teams
- United Nations

### organizing

- RT personnel
- unionization

### organometallic compounds

- UF *metalloorganic compounds*
- GS **organometallic compounds**
- . chlorophylls
- . ferrocenes
- . . alkylferrocene
- . hemoglobin
- . . carboxyhemoglobin
- . . oxyhemoglobin
- . organic aluminum compounds
- . organic germanium compounds
- . organic lithium compounds
- . organic tin compounds
- . porphines
- RT alkoxides
- chelates

∞ chemical compounds  
 ∞ metal compounds  
 metalloids  
 metalorganic chemical vapor  
 deposition  
 organic compounds  
 synthetic metals  
 tetrabutyls

**organometallic polymers**

UF *metalloxiloxane polymers*  
*metalloxane polymers*

RT dendrimers  
 polycarbosilanes  
 ∞ polymers  
 polysilanes

*organometallic vapor deposition*

USE **metalorganic chemical vapor deposition**

**organs**

SN (FOR SPECIFIC ORGANS, ORGAN SUBSTRUCTURES AND ORGAN SYSTEMS SEE ANATOMY)

GS **organs**

. viscera  
 RT anatomy  
 cells (biology)  
 circulatory system  
 digestive system  
 gastrointestinal system  
 genitourinary system  
 glands (anatomy)  
 respiratory system  
 sense organs  
 tissue engineering  
 tissues (biology)

*OR-gates*

USE **gates (circuits)**

*orgel reactor*

USE **organic cooled reactors**

**Orgueil meteorite**

GS celestial bodies  
 . meteorites  
 . . stony meteorites  
 . . . carbonaceous meteorites  
 . . . . carbonaceous chondrites  
 . . . . **Orgueil meteorite**  
 . . . . chondrites  
 . . . . carbonaceous chondrites  
 . . . . **Orgueil meteorite**

*ORIC cyclotron*

USE **Oak Ridge isochronous cyclotron**

∞ **orientation**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT alignment  
 attitude (inclination)  
 azimuth  
 bearing (direction)  
 Bragg angle  
 collimation  
 crystallography  
 directivity  
 education  
 fiber orientation  
 field strength  
 horizontal orientation  
 instrument orientation  
 isotropy  
 optical properties  
 orbital position estimation  
 ply orientation  
 polarization (spin alignment)  
 polarization (waves)  
 position (location)  
 positioning  
 sound localization  
 vertical orientation  
 vertical perception  
 visual perception

**orifice flow**

GS fluid flow  
 . **orifice flow**

RT choked flow  
 critical flow  
 ∞ flow  
 gas flow  
 grazing flow  
 laminar flow  
 liquid flow  
 multiphase flow  
 orifices  
 pipe flow  
 pressure gradients  
 single-phase flow  
 steady flow  
 steam flow  
 subcritical flow  
 supercritical flow  
 turbulent flow  
 unsteady flow

**orifices**

RT annular ducts  
 apertures  
 cavities  
 chokes (fuel systems)  
 chokes (restrictions)  
 ducts  
 flow measurement  
 flowmeters  
 gaps  
 injectors  
 ∞ nozzles  
 openings  
 ∞ operations  
 orifice flow  
 ports (openings)  
 spray nozzles  
 throats  
 Venturi tubes

*Origin of Plasmas in Earth Neighborhood*

USE **OPEN Project**

∞ **origins**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT causes  
 coordinates  
 derivation  
 graphs (charts)  
 meteorite parent bodies  
 petrogenesis

**Orion (radio interferometry network)**

DEF An operational radio interferometry observational network.

GS networks  
 . **Orion (radio interferometry network)**

RT radio interferometers  
 radio receivers  
 tracking networks

*Orion aircraft*

USE **P-3 aircraft**

**Orion constellation**

GS constellations  
 . **Orion constellation**  
 RT Opik theory  
 Orion nebula  
 Sigma Orionis

*Orion crew vehicle*

(added November 2006)  
 USE **Crew Exploration Vehicle**

**Orion nebula**

DEF An H 11 region about 500 pc distant and barely visible to the naked eye in the center of Orion's sword.

GS celestial bodies  
 . nebulae  
 . . **Orion nebula**  
 hydrogen clouds  
 . **Orion nebula**

RT astrophysics  
 Cassiopeia A  
 Crab nebula  
 galaxies  
 Gum nebula

interstellar gas  
 interstellar matter  
 irregular galaxies  
 Magellanic clouds  
 Milky Way Galaxy  
 Opik theory  
 Orion constellation  
 planetary nebulae  
 stellar coronas  
 supernovae

**Orionid meteoroids**

GS celestial bodies  
 . meteoroid showers  
 . . **Orionid meteoroids**  
 . meteoroids  
 . . **Orionid meteoroids**  
 RT Aquarid meteoroids

**Orlicz space**

RT set theory

*ornithopter aircraft*

USE **research aircraft**

**Ornstein-Uhlenbeck process**

RT ∞ processes

*orographic clouds*

USE **cap clouds**

**orography**

GS geography  
 . **orography**  
 geology  
 . **orography**  
 RT cones (volcanoes)  
 geomorphology  
 isostasy  
 Mars volcanoes  
 mountains  
 peaks (landforms)  
 volcanoes  
 volcanology

*orreries*

USE **astronomical models**

**Orr-Sommerfeld equations**

RT ∞ equations  
 flow distortion  
 flow stability  
 flow theory  
 quantum mechanics  
 velocity distribution

**orthicons**

GS electron tubes  
 . camera tubes  
 . . **orthicons**  
 . . . image orthicons  
 RT image intensifiers  
 photocathodes  
 television cameras  
 television equipment

**ortho hydrogen**

GS gases  
 . **ortho hydrogen**  
 RT hydrogen

**ortho para conversion**

GS isomerization  
 . **ortho para conversion**  
 RT ∞ conversion  
 para hydrogen

**orthogonal functions**

GS analysis (mathematics)  
 . complex variables  
 . . **orthogonal functions**  
 . . . Walsh function  
 functions (mathematics)  
 . **orthogonal functions**  
 . . Walsh function  
 RT Bessel functions  
 exponential functions  
 function space  
 Hankel functions  
 hyperbolic functions  
 Laguerre functions



# orthogonal multiplexing theory

Legendre functions  
linear transformations  
Mathieu function  
orthogonality  
orthonormal functions  
quality control

## orthogonal multiplexing theory

RT pulse communication  
signal transmission  
 $\infty$  theories  
wave interaction  
wavelength division multiplexing

## orthogonality

UF *Kronecker product*  
GS moments  
. distribution moments  
. . . **orthogonality**  
statistical analysis  
. variance (statistics)  
. . . multivariate statistical analysis  
. . . **orthogonality**  
RT covariance  
experiment design  
factor analysis  
orthogonal functions  
quality control

## orthography

RT handwriting  
intelligibility  
languages  
linguistics  
semantics  
syntax  
words (language)

## orthonormal functions

GS functions (mathematics)  
. **orthonormal functions**  
RT orthogonal functions  
wavelet analysis

## orthopedics

GS medical science  
. **orthopedics**

## orthophotography

GS imagery  
. photography  
. . . **orthophotography**  
RT aerial photography  
color photography  
mapping

## orthostatic tolerance

RT bed rest  
blood pressure  
fluid shifts (biology)  
head down tilt  
head up tilt  
human tolerances  
lower body negative pressure  
posture  
tilt-table test  
tolerances (physiology)

## orthotropic cylinders

RT  $\infty$  cylinders  
cylindrical bodies  
cylindrical shells  
rocket engine cases

## orthotropic plates

GS structural members  
. plates (structural members)  
. . . **orthotropic plates**

## orthotropic shells

GS shells (structural forms)  
. **orthotropic shells**  
RT cylindrical shells  
metal shells  
reinforced shells  
shell stability

thin walled shells

## orthotropism

RT plates (structural members)

## oscillating cylinders

RT  $\infty$  cylinders  
cylindrical bodies  
cylindrical shells  
oscillations  
vibration

## oscillating flow

GS fluid flow  
. unsteady flow  
. . . **oscillating flow**  
RT buffeting  
compressibility effects  
flow distortion  
nonequilibrium flow  
small perturbation flow  
Strouhal number  
surface tension driven convection

## oscillation dampers

RT  $\infty$  absorbers  
 $\infty$  dampers  
Maxwell bodies  
nonoscillatory action  
nonstabilized oscillation  
nutration dampers  
springs (elastic)  
vibration isolators

## oscillations

DEF Fluctuations or vibrations on each side of a mean value or position. One oscillation is half an oscillatory cycle, consisting of a fluctuation or vibration in one direction; half a vibration. The variation, usually with time, of the magnitude of a quantity with respect to a specified reference when the magnitude is alternately greater and smaller than the reference. Used for phugoid oscillations.

UF *phugoid oscillations*

GS **oscillations**  
. airfoil oscillations  
. . . wing oscillations  
. . . wing rock  
. electron oscillations  
. harmonic oscillation  
. hydrofoil oscillations  
. molecular oscillations  
. nonoscillatory action  
. nonstabilized oscillation  
. plasma oscillations  
. pressure oscillations  
. self oscillation  
. Southern Oscillation  
. stable oscillations  
. stellar oscillations  
. . . solar oscillations  
. transient oscillations  
. transverse oscillation  
. . . H waves  
. Madden-Julian Oscillation  
. quasi-biennial oscillation  
. undamped oscillations

RT amplitudes  
Brunt-Vaisala frequency  
crystal oscillators  
damping  
feedback  
 $\infty$  motion  
nonuniformity  
orbital resonances (celestial mechanics)  
oscillating cylinders  
oscillators  
pendulums  
periodic variations  
perturbation  
resonance  
resonant vibration  
 $\infty$  rhythm  
spacecraft motion  
springs (elastic)  
syntony  
traveling wave tubes  
vibration

vibration tests

## oscillator strengths

DEF A quantum mechanical analog of the number of dispersion electrons having a given natural frequency in an atom, used in an equation for the absorption coefficient of a spectral line.

RT absorption spectra  
absorptivity  
electron oscillations  
electron transitions  
line spectra  
molecular oscillations  
molecular oscillators  
oscillators  
spectral line width

## oscillators

DEF Nonrotating devices for producing alternating current.

UF *wave oscillators*

GS **oscillators**

. autodynes  
. crystal oscillators  
. . . piezoelectric crystals  
. harmonic oscillators  
. mechanical oscillators  
. . . pendulums  
. . . gyroscopic pendulums  
. microwave oscillators  
. . . magnetrons  
. . . nigotrons  
. molecular oscillators  
. relaxation oscillators  
. . . phantastrons  
. synchronized oscillators  
. vacuum tube oscillators  
. voltage controlled oscillators

RT amplifiers  
automatic frequency control  
cavity resonators  
circuits  
electron tubes  
feedback  
feedback amplifiers  
flip-flops  
frequency pulling  
frequency stability  
frequency synthesizers  
harmonic generators  
inverters  
microwave tubes  
 $\infty$  motion  
multivibrators  
negative feedback  
nonoscillatory action  
nonstabilized oscillation  
oscillations  
oscillator strengths  
parametrons  
periodic variations  
perturbation  
positive feedback  
resonant frequencies  
resonators  
self excitation  
semiconductor devices  
signal generators  
solid state devices  
subharmonic generators  
superconducting cavity resonators  
transformers  
vibration

*oscillograms*

USE **oscillographs**

## oscillographs

UF *oscillograms*  
GS measuring instruments  
. **oscillographs**  
recording instruments  
. **oscillographs**  
RT Barkhausen effect  
electrical measurement  
oscilloscopes

- time measurement
- oscilloscopes**  
 DEF Instruments for producing visual representations of oscillations or changes in an electric current.  
 RT cathode ray tubes  
 electronic equipment tests  
 flying spot scanners  
 frequency analyzers  
 oscillographs  
 sweep circuits  
 sweep frequency  
 synchrosopes  
 video equipment
- oscultations*  
 USE **double cusps**
- Oseen approximation**  
 GS analysis (mathematics)  
 . numerical analysis  
 . . approximation  
 . . . **Oseen approximation**  
 RT incompressible fluids  
 Navier-Stokes equation  
 Roshko prediction  
 Stokes flow  
 viscous fluids
- osmium**  
 GS chemical elements  
 . **osmium**  
 . . osmium isotopes  
 metals  
 . refractory metals  
 . . **osmium**  
 . . . osmium isotopes  
 . transition metals  
 . . **osmium**  
 . . . osmium isotopes  
 refractory materials  
 . refractory metals  
 . . **osmium**  
 . . . osmium isotopes
- osmium alloys**  
 GS alloys  
 . heat resistant alloys  
 . . refractory metal alloys  
 . . . **osmium alloys**  
 refractory materials  
 . refractory metal alloys  
 . . **osmium alloys**
- osmium compounds**  
 RT  $\infty$  chemical compounds  
 $\infty$  Group 8 compounds  
 $\infty$  metal compounds
- osmium isotopes**  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **osmium isotopes**  
 . osmium  
 . . **osmium isotopes**  
 metals  
 . refractory metals  
 . . osmium  
 . . . **osmium isotopes**  
 . transition metals  
 . . osmium  
 . . . **osmium isotopes**  
 refractory materials  
 . refractory metals  
 . . osmium  
 . . . **osmium isotopes**
- osmometers**  
 GS measuring instruments  
 . pressure gages  
 . . **osmometers**
- osmosis**  
 UF *hypertonia*  
*osmotic pressure*  
 GS **osmosis**  
 . reverse osmosis  
 RT cell membranes (biology)
- demineralizing  
 desalinization  
 diaphragms (mechanics)  
 diffusion  
 extraction  
 homeostasis  
 isotonicity  
 membranes  
 permeating  
 pressure  
 $\infty$  separation  
 water balance
- osmotic pressure*  
 USE **osmosis**
- OSO**  
 UF *Orbiting Solar Observatory*  
 GS artificial satellites  
 . geophysical satellites  
 . . **OSO**  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 . scientific satellites  
 . . astronomical satellites  
 . . . **OSO**  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . **OSO**  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 solar observatories  
 . . . **OSO**  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 geophysical observatories  
 . . . **OSO**  
 . . . AOSO  
 . . . OSO-1  
 . . . OSO-2  
 . . . OSO-3  
 . . . OSO-4  
 . . . OSO-5  
 . . . OSO-6  
 . . . OSO-7  
 . . . OSO-8  
 . . . OSO-C  
 sun  
 Thor Delta launch vehicle
- OSO-1**  
 UF *OSO-A*  
*S-16 satellite*  
 GS artificial satellites  
 . geophysical satellites
- . . OSO  
 . . . **OSO-1**  
 . scientific satellites  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-1**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-1**  
 . solar observatories  
 . . . OSO  
 . . . . **OSO-1**  
 . geophysical observatories  
 . . OSO  
 . . . **OSO-1**  
 RT Delta launch vehicle
- OSO-2**  
 UF *OSO-B*  
*S-17 satellite*  
 GS artificial satellites  
 . geophysical satellites  
 . . OSO  
 . . . **OSO-2**  
 . scientific satellites  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-2**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-2**  
 . solar observatories  
 . . . OSO  
 . . . . **OSO-2**  
 . geophysical observatories  
 . . OSO  
 . . . **OSO-2**  
 RT Delta launch vehicle
- OSO-3**  
 UF *OSO-E*  
 GS artificial satellites  
 . geophysical satellites  
 . . OSO  
 . . . **OSO-3**  
 . scientific satellites  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-3**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-3**  
 . solar observatories  
 . . . OSO  
 . . . . **OSO-3**  
 . geophysical observatories  
 . . OSO  
 . . . **OSO-3**
- OSO-4**  
 UF *OSO-D*  
 GS artificial satellites  
 . geophysical satellites  
 . . OSO  
 . . . **OSO-4**  
 . scientific satellites  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-4**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-4**  
 . solar observatories  
 . . . OSO  
 . . . . **OSO-4**  
 . geophysical observatories  
 . . OSO  
 . . . **OSO-4**  
 RT Delta launch vehicle
- OSO-5**  
 UF *OSO-F*

- GS artificial satellites  
 . geophysical satellites  
 . . . OSO  
 . . . **OSO-5**  
 . scientific satellites  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-5**  
 . observatories  
 . . . astronomical observatories  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-5**  
 . . . solar observatories  
 . . . OSO  
 . . . . **OSO-5**  
 . . . geophysical observatories  
 . . . OSO  
 . . . . **OSO-5**
- OSO-6**  
 UF *OSO-G*  
 GS artificial satellites  
 . geophysical satellites  
 . . . OSO  
 . . . . **OSO-6**  
 . scientific satellites  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-6**  
 . observatories  
 . . . astronomical observatories  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-6**  
 . . . solar observatories  
 . . . OSO  
 . . . . **OSO-6**  
 . . . geophysical observatories  
 . . . OSO  
 . . . . **OSO-6**
- OSO-7**  
 UF *OSO-H*  
 GS artificial satellites  
 . geophysical satellites  
 . . . OSO  
 . . . . **OSO-7**  
 . scientific satellites  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-7**  
 . observatories  
 . . . astronomical observatories  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-7**  
 . . . solar observatories  
 . . . OSO  
 . . . . **OSO-7**  
 . . . geophysical observatories  
 . . . OSO  
 . . . . **OSO-7**  
 RT dual spin spacecraft
- OSO-8**  
 DEF One of a series of NASA orbiting solar observatories developed mainly for solar research. Used for OSO-J.  
 UF *OSO-J*  
 GS artificial satellites  
 . geophysical satellites  
 . . . OSO  
 . . . . **OSO-8**  
 . scientific satellites  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-8**  
 . observatories  
 . . . astronomical observatories  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-8**  
 . . . solar observatories  
 . . . OSO  
 . . . . **OSO-8**  
 . . . geophysical observatories  
 . . . OSO
- . . . **OSO-8**  
 OSO-A  
 USE **OSO-1**  
 OSO-B  
 USE **OSO-2**  
 OSO-C  
 UF *S-57 satellite*  
 GS artificial satellites  
 . geophysical satellites  
 . . . OSO  
 . . . . **OSO-C**  
 . scientific satellites  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-C**  
 . observatories  
 . . . astronomical observatories  
 . . . astronomical satellites  
 . . . OSO  
 . . . . **OSO-C**  
 . . . solar observatories  
 . . . OSO  
 . . . . **OSO-C**  
 . . . geophysical observatories  
 . . . OSO  
 . . . . **OSO-C**  
 RT Delta launch vehicle  
 OSO-D  
 USE **OSO-4**  
 OSO-E  
 USE **OSO-3**  
 OSO-F  
 USE **OSO-5**  
 OSO-G  
 USE **OSO-6**  
 OSO-H  
 USE **OSO-7**  
 OSO-J  
 USE **OSO-8**  
 Osprey aircraft  
 USE **V-22 aircraft**  
 Osprey missile  
 GS missiles  
 . **Osprey missile**  
 RT J-85 engine  
 OSS-1 payload  
 DEF Experiment package flown aboard the Space Shuttle STS-3 in 1982 which was sponsored by the NASA Office of Space Sciences from which the acronym is derived.  
 GS payloads  
 . Space Shuttle payloads  
 . . **OSS-1 payload**  
 RT exploration  
 Get Away Specials (STS)  
 investigation  
 NASA programs  
 space transportation system  
 spaceborne experiments
- OSTA-1 payload**  
 SN (OFFICE OF SPACE & TERRESTRIAL APPLICATIONS PAYLOADS)  
 DEF Spaceborne experiments flown aboard the Space Shuttle STS-2 in 1981 which was sponsored by the NASA Office of Space & Terrestrial Applications from which the acronym is derived. Used for Office of Space & Terrestrial Applications Payloads.  
 UF *Office of Space & Terrestrial Applications Payloads*  
 GS payloads  
 . Space Shuttle payloads  
 . . **OSTA-1 payload**  
 RT space transportation system  
 spaceborne experiments
- OSTA-2 payload**  
 SN (OFFICE OF SPACE & TERRESTRIAL APPLICATIONS PAYLOADS)  
 UF *Office of Space & Terrestrial Applications Payloads*  
 GS payloads  
 . Space Shuttle payloads  
 . . **OSTA-2 payload**  
 RT space transportation system  
 Space Shuttle STS-17, sponsored by the NASA Office of Space & Terrestrial Applications from which the acronym is derived. The systems included the feature identification and location experiment-1 (FILE-1), the measurement of atmospheric pollution from satellite (MAPS), the imaging camera-B, and the large format camera/attitude reference system (LFC/ARS). Used for Office of Space & Terrestrial Applications Payloads.  
 UF *Office of Space & Terrestrial Applications Payloads*  
 GS payloads  
 . Space Shuttle payloads  
 . . **OSTA-3 payload**  
 RT remote sensing  
 space transportation system  
 spaceborne experiments  
 spacecraft equipment
- OSTA-3 payload**  
 SN (OFFICE OF SPACE & TERRESTRIAL APPLICATIONS PAYLOADS)  
 DEF Spaceborne systems flown aboard the Space Shuttle STS-17, sponsored by the NASA Office of Space & Terrestrial Applications from which the acronym is derived. The systems included the feature identification and location experiment-1 (FILE-1), the measurement of atmospheric pollution from satellite (MAPS), the imaging camera-B, and the large format camera/attitude reference system (LFC/ARS). Used for Office of Space & Terrestrial Applications Payloads.  
 UF *Office of Space & Terrestrial Applications Payloads*  
 GS payloads  
 . Space Shuttle payloads  
 . . **OSTA-3 payload**  
 RT remote sensing  
 space transportation system  
 spaceborne experiments  
 spacecraft equipment
- osteoblasts**  
*(added June 2001)*  
 DEF Bone-forming cells that secrete an extracellular matrix. Hydroxyapatite crystals are then deposited into the matrix to form bone.  
 GS cells (biology)  
 . **osteoblasts**  
 RT bone demineralization  
 bone mineral content  
 bones  
 cyto genesis  
 fibroblasts  
 osteocalcin  
 osteogenesis  
 osteoporosis
- osteocalcin**  
*(added August 2004)*  
 DEF Vitamin K-dependent calcium-binding protein synthesized by osteoblasts and found primarily in bone.  
 GS biopolymers  
 . proteins  
 . . **osteocalcin**  
 . organic compounds  
 . proteins  
 . . **osteocalcin**  
 RT bone demineralization  
 bone mineral content  
 bones  
 calcification  
 calcium  
 osteoblasts  
 phyloquinone
- osteogenesis**  
*(added August 2004)*  
 DEF The process of bone formation. Histogenesis of bone including ossification.  
 UF *bone formation*  
 GS cyto genesis  
 . **osteogenesis**  
 RT bone demineralization  
 bone marrow  
 bone mineral content  
 bones  
 osteoblasts  
 tissues (biology)
- osteoporosis**  
 DEF A medical condition whose chief symptom is the loss of internal bone mass.  
 GS diseases  
 . **osteoporosis**  
 RT bone demineralization  
 bone mineral content  
 bones  
 calcium metabolism  
 metabolism

- osteoblasts
- Ostwald coarsening*  
USE **Ostwald ripening**
- Ostwald ripening**  
(added March 1994)  
UF *Ostwald coarsening*  
RT coarseness  
crystallization  
grain size  
microstructure  
phase transformations  
precipitation (chemistry)  
solid solutions  
solidification
- OT-2  
USE **ESSA 2 satellite**
- OT-3  
USE **ESSA 1 satellite**
- OTF  
USE **optical transfer function**
- otolaryngology**  
GS medical science  
. **otolaryngology**  
RT ear
- otolith organs**  
DEF Structures of the inner ear (utricle and saccule) which respond to linear acceleration and tilting.  
GS anatomy  
. sense organs  
. . ear  
. . . labyrinth  
. . . . **otolith organs**  
. . gravireceptors  
. . . **otolith organs**  
receptors (physiology)  
. gravireceptors  
. . **otolith organs**  
RT oculogravic illusions  
Orbiting Frog Otolith  
semicircular canals  
vertical perception
- otology**  
GS medical science  
. **otology**  
RT ear
- OTS (ESA)**  
UF *Orbital Test Satellite (ESA)*  
GS artificial satellites  
. ESA satellites  
. . **OTS (ESA)**  
ESA spacecraft  
. ESA satellites  
. . **OTS (ESA)**  
RT European Communications Satellite  
European space programs
- Otto cycle**  
GS cycles  
. thermodynamic cycles  
. . **Otto cycle**  
RT Rankine cycle
- OTV  
USE **orbit transfer vehicles**
- outcrops**  
RT folds (geology)  
formations  
geology
- Outer Banks (NC)**  
GS landforms  
. barriers (landforms)  
. . **Outer Banks (NC)**  
RT Atlantic Ocean  
islands
- North Carolina
- outer planet missions*  
USE **Grand Tours**
- outer planet spacecraft*  
USE **outer planets explorers**
- outer planets explorers**  
UF *outer planet spacecraft*  
*planetary explorer*  
RT Delta launch vehicle  
Explorer satellites  
flyby missions  
Grand Tours  
interplanetary flight  
Mars probes  
∞ spacecraft  
TOPS (spacecraft)  
Venus probes
- outer radiation belt**  
GS particles  
. charged particles  
. . magnetically trapped particles  
. . . radiation belts  
. . . . **outer radiation belt**  
. corpuscular radiation  
. . radiation belts  
. . . **outer radiation belt**  
. trapped particles  
. . magnetically trapped particles  
. . . radiation belts  
. . . . **outer radiation belt**  
RT artificial radiation belts  
inner radiation belt  
proton belts  
∞ radiation
- outer space treaty**  
GS policies  
. foreign policy  
. . international relations  
. . . international cooperation  
. . . . **outer space treaty**  
RT conventions  
international law  
research and development  
resource allocation  
space law
- outgassing**  
DEF The evolution of gas from a material in a vacuum.  
RT degassing  
desorption  
evolution (liberation)  
gas evolution  
purging  
residual gas  
transpiration  
vacuum  
vacuum pumps
- outlet flow**  
GS fluid flow  
. **outlet flow**  
RT cascade flow  
channel flow  
∞ flow  
flow characteristics  
nozzle flow
- outlets**  
GS **outlets**  
. vents  
RT apertures  
cavities  
∞ discharge  
doors  
ducts  
egress  
exhaust nozzles  
exhaust systems  
gates (openings)  
∞ nozzles  
openings  
output  
pipe nozzles  
plugs
- ports (openings)  
∞ terminals
- outlets (geology)*  
USE **estuaries**
- outliers (landforms)**  
DEF Areas or groups of rocks surrounded by rocks of older age. Used for klippen.  
UF *klippen*  
GS landforms  
. **outliers (landforms)**  
RT formations  
rocks  
soil erosion
- outliers (statistics)**  
DEF In sets of data values so far removed from other values in the distribution that their presence cannot be attributed to the random combination of change causes.  
RT mathematical models  
probability theory  
statistical analysis  
statistical distributions  
statistical tests
- output**  
DEF The yield or product of an activity furnished by man, machine, or system. Used for dummy loads.  
UF *dummy loads*  
GS **output**  
. cardiac output  
. . heart minute volume  
. . stroke volume  
. laser outputs  
. maser outputs  
RT ∞ capacity  
catchers  
computer systems performance  
delivery  
efflux  
input  
outlets  
∞ performance  
power conditioning  
printouts  
∞ production  
products  
readout  
supplying  
tracking problem  
transfer functions  
transmission  
yield
- OV-1 aircraft**  
UF *AO-1 aircraft*  
*Grumman OV-1C aircraft*  
*Mohawk aircraft*  
GS Grumman aircraft  
. **OV-1 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **OV-1 aircraft**  
monoplanes  
. **OV-1 aircraft**  
observation aircraft  
. **OV-1 aircraft**  
RT ∞ aircraft
- OV-1 satellites**  
GS artificial satellites  
. scientific satellites  
. . **OV-1 satellites**  
RT gravity gradient satellites  
spin stabilization
- OV-2 satellites**  
GS artificial satellites  
. scientific satellites  
. . **OV-2 satellites**  
RT gravity gradient satellites  
spin stabilization
- OV-3 satellites**  
GS artificial satellites  
. scientific satellites  
. . **OV-3 satellites**

## OV-4 satellites

RT gravity gradient satellites  
spin stabilization

### OV-4 satellites

GS artificial satellites  
. scientific satellites

RT gravity gradient satellites  
spin stabilization

### OV-5 satellites

GS artificial satellites  
. scientific satellites

RT gravity gradient satellites  
spin stabilization

### OV-10 aircraft

UF *NA-300 aircraft*  
GS attack aircraft  
. COIN aircraft  
. . **OV-10 aircraft**  
jet aircraft  
. turboprop aircraft  
. . **OV-10 aircraft**  
monoplanes  
. **OV-10 aircraft**  
North American aircraft  
. **OV-10 aircraft**  
observation aircraft  
. **OV-10 aircraft**  
RT ∞ aircraft

### ovaries

GS anatomy  
. genitourinary system  
. . reproductive systems  
. . . sex glands  
. . . . gonads  
. . . . . **ovaries**  
. glands (anatomy)  
. . endocrine glands  
. . . gonads  
. . . . **ovaries**  
. . sex glands  
. . . gonads  
. . . . **ovaries**  
RT eggs  
menstruation

### ovens

GS heating equipment  
. **ovens**  
RT baking  
dry heat  
furnaces  
waste energy utilization

### overcast

USE **cloud cover**

### overcompression

USE **overconsolidation**

### overconsolidation

UF *overcompression*  
RT consolidation  
foundations

### Overhauser effect

DEF In atomic physics, a radio frequency field applied to a substance in an external magnetic field, whose nuclei have spin 1/2 and which has unpaired electrons at the electron spin resonance frequency. This results in polarization of the nuclei as great as if the nuclei had the much larger electron magnetic moment.

RT ∞ effects  
magnetic resonance  
nuclear spin  
∞ polarization  
resonance

### overpressure

DEF (1) The pressure resulting from the blast wave of an explosion. It is referred to as positive when it exceeds atmospheric pressure and negative during the passage of the wave when resulting pressures are less than atmospheric pressure. (2) The transient pressure,

usually expressed in pounds per square inch, exceeding existing atmospheric pressure manifested in the blast wave from an explosion. During some period of the passage of the wave past a point, the overpressure is negative.

GS pressure  
. **overpressure**  
RT blast loads  
dynamic pressure

### over-the-horizon radar

GS radar  
. search radar  
. . **over-the-horizon radar**  
RT early warning systems  
moving target indicators  
optical radar  
radar detection  
radar range

### overtones

USE **harmonics**

### overvoltage

RT circuit protection  
decomposition  
electric potential  
Geiger counters  
open circuit voltage  
polarization (charge separation)  
surges

### oxalates

GS **oxalates**  
. cobalt oxalates  
RT oxalic acid  
∞ oxygen compounds

### oxalic acid

GS acids  
. carboxylic acids  
. . **oxalic acid**  
organic compounds  
. carboxylic acids  
. . **oxalic acid**  
RT oxalates

### oxamic acids

GS acids  
. carboxylic acids  
. . **oxamic acids**  
nitrogen compounds  
. amides  
. . **oxamic acids**  
organic compounds  
. carboxylic acids  
. . **oxamic acids**

### oxazole

DEF Compounds that contain a five-membered heterocyclic ring containing one nitrogen and one oxygen atom.

GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . azoles  
. . . . **oxazole**

### oxetane polymers

(*added August 1994*)  
RT alkenes  
binders (materials)  
carbonyl compounds  
monomers  
photochemical reactions  
∞ polymers  
propellants

### oxidase

GS acids  
. **oxidase**  
biopolymers  
. proteins  
. . enzymes  
. . . **oxidase**  
organic compounds  
. proteins  
. . enzymes  
. . . **oxidase**

RT dehydrogenases

### oxidation

DEF A reaction in which electrons are removed from a reactant. Sometimes, more specifically the combination of a reactant with oxygen.

GS chemical reactions  
. **oxidation**  
. . electrochemical oxidation  
. . photooxidation  
. . rusting

RT association reactions  
charring  
chemical attack  
combustion  
combustion chemistry  
corrosion  
degradation  
dehydrogenation  
dopa  
electron transfer  
epoxidation  
erosive burning  
fuel combustion  
hot corrosion  
hydrocarbon combustion  
metal combustion  
oxidizers  
oxygenation  
passivity  
reduction (chemistry)  
roasting  
thermal resistance  
turbulent combustion

### oxidation resistance

GS corrosion resistance  
. **oxidation resistance**  
RT passivity  
∞ resistance  
rusting  
siliconizing  
thermal resistance

### oxidation-reduction reactions

DEF An oxidizing chemical change, where an element's positive valence is increased (electron loss), accompanied by a simultaneous reduction of an associated element (electron gain).

GS chemical reactions  
. **oxidation-reduction reactions**  
RT electrochemistry  
reduction (chemistry)

### oxide dispersion strengthening

(*added February 1994*)  
GS dispersion strengthening  
. **oxide dispersion strengthening**  
RT alloys  
hardening (materials)  
heat resistant alloys

### oxide films

RT cathodic coatings  
∞ films  
metal oxides  
metal surfaces  
surface layers  
thin films

### oxides

GS chalcogenides  
. **oxides**  
. . alkoxides  
. . anhydrides  
. . . peroxides  
. . . . inorganic peroxides  
. . . . . hydrogen peroxide  
. . . . . organic peroxides  
. . . . . potassium peroxides  
. . . . . sodium peroxides  
. . boron oxides  
. . brucite  
. . carbon monoxide  
. . carbon suboxides  
. . chlorine oxides  
. . dioxides  
. . . carbon dioxide

- . . . flint
- . . . hydrogen peroxide
- . . . silicon dioxide
- . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
- . . . sulfur dioxides
- . . . germanium oxides
- . . . heavy water
- . . . indium oxides
- . . . metal oxides
  - . . . . . alkaline earth oxides
  - . . . . . barium oxides
  - . . . . . beryllium oxides
  - . . . . . alexandrite
  - . . . . . calcium oxides
  - . . . . . akermanite
  - . . . . . magnesium oxides
  - . . . . . akermanite
  - . . . . . periclase
  - . . . . . aluminum oxides
  - . . . . . alexandrite
  - . . . . . sapphire
  - . . . . . bismuth oxides
  - . . . . . cerium oxides
  - . . . . . cesium oxides
  - . . . . . chromium oxides
  - . . . . . cobalt oxides
  - . . . . . copper oxides
  - . . . . . gallium oxides
  - . . . . . hafnium oxides
  - . . . . . iron oxides
  - . . . . . hematite
  - . . . . . ilmenite
  - . . . . . magnetite
  - . . . . . lanthanum oxides
  - . . . . . lead oxides
  - . . . . . lithium oxides
  - . . . . . manganese oxides
  - . . . . . Hopcalite (trademark)
  - . . . . . mercury oxides
  - . . . . . mixed oxides
  - . . . . . BSCCO superconductors
  - . . . . . YBCO superconductors
  - . . . . . molybdenum oxides
  - . . . . . nickel oxides
  - . . . . . niobium oxides
  - . . . . . platinum oxides
  - . . . . . plutonium oxides
  - . . . . . potassium oxides
  - . . . . . scandium oxides
  - . . . . . silver oxides
  - . . . . . sodium peroxides
  - . . . . . strontium oxides
  - . . . . . tantalum oxides
  - . . . . . thorium oxides
  - . . . . . tin oxides
  - . . . . . titanium oxides
  - . . . . . anatase
  - . . . . . ilmenite
  - . . . . . rutile
  - . . . . . tungsten oxides
  - . . . . . scheelite
  - . . . . . uranium oxides
  - . . . . . vanadium oxides
  - . . . . . yttrium oxides
  - . . . . . zinc oxides
  - . . . . . zirconium oxides
  - . . . . . yttria-stabilized zirconia
- . . . nitrogen oxides
  - . . . . . nitric oxide
  - . . . . . nitrogen dioxide
  - . . . . . nitrogen tetroxide
  - . . . . . nitrous oxides
- . . . phosphorus oxides
  - . . . . . pyroxenes
  - . . . . . enstatite
- . . . selenium oxides
- . . . silicon oxides
  - . . . . . muscovite
  - . . . . . nephelite
  - . . . . . silicon dioxide
  - . . . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
- . . . spodumene
- . . . sulfur oxides
  - . . . . . sulfur dioxides
- RT anodic coatings
- cathodic coatings
- ethylene oxide
- euxenite
- insulation
- metal coatings
- niobates
- nonflammable materials
- ∞ oxygen compounds
- solid oxide fuel cells
- water
- oxidizers**
  - DEF Specifically, substances (not necessarily containing oxygen) that support the combustion of a fuel or propellant.
  - GS **oxidizers**
    - . high energy oxidizers
    - . liquid oxidizers
    - . liquid oxygen
    - . photochemical oxidants
    - . rocket oxidizers
    - . . FLOX
    - . . TAGN
  - RT ∞ agents
    - air pollution
    - fluorine
    - fuels
    - nitramine propellants
    - oxidation
- oximetry**
  - RT biochemical oxygen demand
  - blood
  - hyperoxia
  - hypoxia
  - oxygen consumption
- oxosilanes*
- USE **polysilanes**
- oxyacetylene**
  - GS organic compounds
    - . hydrocarbons
    - . . aliphatic hydrocarbons
    - . . . alkynes
    - . . . . . **oxyacetylene**
  - RT acetylene
  - detonable gas mixtures
  - ∞ oxygen compounds
- oxyalkylation*
- USE **alkylation**
- oxyfluorides**
  - GS halogen compounds
    - . fluorine compounds
    - . . fluorides
    - . . . **oxyfluorides**
    - . . halides
    - . . . fluorides
    - . . . . . **oxyfluorides**
  - RT ∞ oxygen compounds
- oxygen**
  - GS chemical elements
    - . **oxygen**
    - . . liquid oxygen
    - . . oxygen isotopes
    - . . . oxygen 17
    - . . . oxygen 18
  - gases
    - . **oxygen**
    - . . liquid oxygen
    - . . oxygen isotopes
    - . . . oxygen 17
    - . . . oxygen 18
  - RT Chlorella
  - high pressure oxygen
  - oxygen atoms
  - oxygen ions
  - oxygen plasma
  - ozone
  - reaction bonding
  - Schumann-Runge bands
  - sialon
- oxygen 17**
  - DEF An isotope of oxygen.
  - GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . oxygen isotopes
    - . . . . . **oxygen 17**
    - . . oxygen
    - . . . oxygen isotopes
    - . . . . . **oxygen 17**
  - gases
    - . oxygen
    - . . oxygen isotopes
    - . . . **oxygen 17**
- oxygen 18**
  - GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . oxygen isotopes
    - . . . . . **oxygen 18**
    - . . oxygen
    - . . . oxygen isotopes
    - . . . . . **oxygen 18**
  - gases
    - . oxygen
    - . . oxygen isotopes
    - . . . **oxygen 18**
- oxygen afterglow**
  - GS afterglows
  - . **oxygen afterglow**
- oxygen analyzers**
  - UF *oxygen detectors*
  - GS measuring instruments
    - . **oxygen analyzers**
  - RT gas analysis
- oxygen atoms**
  - GS atoms
    - . **oxygen atoms**
  - RT oxygen
- oxygen breathing**
  - RT ∞ breathing
- ∞ **oxygen compounds**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT acids
    - aluminates
    - arsenates
    - borates
    - bromates
    - carbohydrates
    - carbon suboxides
    - carbonates
  - ∞ chemical compounds
    - chlorates
    - chromates
    - germanium oxides
    - niobates
    - oxalates
    - oxides
    - oxyacetylene
    - oxyfluorides
    - oxygen fluorides
    - ozonates
    - ozone fluoride
    - ozonides
    - stannates
- oxygen consumption**
  - GS consumption
    - . **oxygen consumption**
  - RT biochemical oxygen demand
  - hyperoxia
  - hypoxia
  - metabolism
  - oximetry
- oxygen deficiency*
- USE **hypoxia**
- oxygen detectors*
- USE **oxygen analyzers**

## oxygen fluorides

### oxygen fluorides

- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . **oxygen fluorides**
- . halides
- . . fluorides
- . . . **oxygen fluorides**
- RT ∞ oxygen compounds

### oxygen ions

- GS ions
- . **oxygen ions**
- RT free radicals
- negative ions
- oxygen

### oxygen isotopes

- GS chemical elements
- . nuclides
- . . isotopes
- . . . **oxygen isotopes**
- . . . . oxygen 17
- . . . . oxygen 18
- . oxygen
- . . **oxygen isotopes**
- . . . oxygen 17
- . . . oxygen 18
- gases
- . oxygen
- . . **oxygen isotopes**
- . . . oxygen 17
- . . . oxygen 18

### oxygen masks

- GS breathing apparatus
- . **oxygen masks**
- masks
- . **oxygen masks**
- oxygen supply equipment
- . **oxygen masks**
- RT high altitude breathing
- life support systems
- portable life support systems

### oxygen metabolism

- GS metabolism
- . **oxygen metabolism**
- RT hydrogen metabolism
- respiration

### oxygen plasma

- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **oxygen plasma**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **oxygen plasma**
- RT argon plasma
- helium plasma
- hydrogen plasma
- oxygen

### oxygen production

- RT closed ecological systems
- gas exchange
- in situ resource utilization

### oxygen recombination

- GS chemical reactions
- . atomic recombination
- . . **oxygen recombination**
- recombination reactions
- . atomic recombination
- . . **oxygen recombination**
- RT ionization

### oxygen regulators

- GS control equipment
- . regulators
- . . **oxygen regulators**
- RT flow regulators
- pressure regulators

### oxygen spectra

- GS spectra
- . **oxygen spectra**

- RT airglow
- Herzberg bands
- molecular spectra
- solar spectra

### oxygen supply equipment

- UF *oxygen systems*
- GS **oxygen supply equipment**
- . oxygen masks
- RT AEPS
- air conditioning equipment
- breathing apparatus
- cabin atmospheres
- compressed air
- controlled atmospheres
- emergency life sustaining systems
- life support systems
- pressurized cabins
- survival equipment

### *oxygen systems*

- USE **oxygen supply equipment**

### oxygen tension

- GS pressure
- . partial pressure
- . . **oxygen tension**
- . . . hypoxemia

### *oxygen toxicity*

- USE **hyperoxia**

### oxygenation

- GS chemical reactions
- . **oxygenation**
- RT aeration
- dissolved gases
- oxidation

### oxygen-hydrocarbon rocket engines

- (added May 1989)
- UF *liquid oxygen hydrocarbon rocket engines*
- GS *LOX-hydrocarbon rocket engines*
- engines
- . rocket engines
- . . liquid propellant rocket engines
- . . . **oxygen-hydrocarbon rocket engines**
- RT booster rocket engines
- liquid oxygen
- reusable rocket engines
- spacecraft propulsion

### oxyhalides

- GS halogen compounds
- . halides
- . . **oxyhalides**

### oxyhemoglobin

- GS biopolymers
- . proteins
- . . hemoglobin
- . . . **oxyhemoglobin**
- organic compounds
- . proteins
- . . hemoglobin
- . . . **oxyhemoglobin**
- organometallic compounds
- . hemoglobin
- . . **oxyhemoglobin**
- RT erythrocytes

### oxynitrides

- DEF Base for a broad field of nitrogen ceramics utilizing silicon, aluminum, and other elements to produce high temperature refractory materials.
- GS nitrogen compounds
- . nitrides
- . . **oxynitrides**
- RT ∞ chemical compounds
- ∞ Group 5A compounds

### ozonates

- RT ∞ oxygen compounds
- ozone

### ozone

- DEF A very active form of oxygen that may

be produced by the corona, arcing, or ultra-violet rays.

- GS gases
- . **ozone**
- RT Halogen Occultation Experiment
- oxygen
- ozonates
- ozone fluoride
- ozonides
- ozonometry
- photochemical oxidants
- quasi-biennial oscillation
- SAGE satellite
- Solar Mesosphere Explorer
- volatile organic compounds

### ozone depletion

- (added December 1991)
- UF *ozone holes*
- GS depletion
- . **ozone depletion**
- RT air pollution
- Antarctic regions
- Arctic regions
- atmospheric composition
- chlorofluorocarbons
- chlorofluoromethane
- ozonometry
- ozonosphere
- Total Ozone Mapping Spectrometer

### ozone fluoride

- GS halogen compounds
- . fluorine compounds
- . . fluorides
- . . . **ozone fluoride**
- . halides
- . . fluorides
- . . . **ozone fluoride**
- RT ∞ oxygen compounds
- ozone

### *ozone holes*

- USE **ozone depletion**

### *ozone layer*

- USE **ozonosphere**

### ozonesondes

- (added July 2005)
- DEF Instruments which measure atmospheric ozone profiles.
- GS measuring instruments
- . meteorological instruments
- . . **ozonesondes**
- . sondes
- . . **ozonesondes**
- RT air sampling
- balloon sounding
- balloon-borne instruments
- ozonometry

### ozonides

- RT ∞ oxygen compounds
- ozone

### ozonometry

- GS chemical tests
- . chemical analysis
- . . gas analysis
- . . . **ozonometry**
- RT ozone
- ozone depletion
- ozonesondes
- Total Ozone Mapping Spectrometer

### ozonosphere

- DEF The general stratum of the upper atmosphere in which there is an appreciable ozone concentration and in which ozone plays an important part in the radiation balance of the atmosphere. This region lies roughly between 10 and 50 kilometers, with maximum ozone concentration at about 20 to 25 kilometers. Used for ozone layer.
- UF *ozone layer*
- GS Earth atmosphere
- . middle atmosphere
- . . stratosphere
- . . . **ozonosphere**

RT chemosphere  
chlorofluorocarbons  
homosphere

ozone depletion  
Umkehr effect

upper atmosphere



# P

## P band

- SN (225 TO 390 MHz)
- GS frequencies
  - . radio frequencies
  - . microwave frequencies
  - . . . **P band**
  - . ultrahigh frequencies
  - . . . **P band**
  - . very high frequencies
  - . . . **P band**

## P waves

- GS elastic waves
  - . **P waves**
- RT compressible fluids
  - compression waves
  - crustal fractures
  - dilatational waves
- S waves
  - seismic waves
  - surface waves

## P-1 engine

- GS engines
  - . rocket engines
  - . booster rocket engines
  - . . . **P-1 engine**
  - . solid propellant rocket engines
  - . . . **P-1 engine**

## P-3 aircraft

- UF *Orion aircraft*
- P3V aircraft*
- GS antisubmarine warfare aircraft
  - . **P-3 aircraft**
  - jet aircraft
  - . turboprop aircraft
  - . . . **P-3 aircraft**
  - Lockheed aircraft
  - . **P-3 aircraft**
  - monoplanes
  - . **P-3 aircraft**
- RT  $\infty$  aircraft
  - turboprop engines

## P3V aircraft

- USE **P-3 aircraft**

## P-51 aircraft

- UF *Mustang aircraft*
- GS attack aircraft
  - . fighter aircraft
  - . . . **P-51 aircraft**
  - monoplanes
  - . **P-51 aircraft**
  - North American aircraft
  - . **P-51 aircraft**
  - single engine aircraft
  - . **P-51 aircraft**
- RT  $\infty$  aircraft

## P78-2 satellite

- USE **SCATHA satellite**

## P-84 aircraft

- USE **jet provost aircraft**

## P-160 aircraft

- UF *ME P-160 aircraft*
- Messerschmitt ME P-160 aircraft*
- GS commercial aircraft
  - . **P-160 aircraft**
  - passenger aircraft
  - . **P-160 aircraft**
  - transport aircraft
  - . cargo aircraft
  - . . . **P-160 aircraft**
- RT  $\infty$  aircraft

## P-166 aircraft

- UF *Piaggio P-166 aircraft*
- GS monoplanes
  - . **P-166 aircraft**
  - passenger aircraft
  - . **P-166 aircraft**
  - Piaggio aircraft
  - . **P-166 aircraft**
  - transport aircraft
  - . cargo aircraft

## . . . P-166 aircraft

- RT  $\infty$  aircraft

## P-308 aircraft

- UF *ME P-308 aircraft*
- Messerschmitt ME P-308 aircraft*
- GS attack aircraft
  - . **P-308 aircraft**
  - jet aircraft
  - . **P-308 aircraft**
  - monoplanes
  - . **P-308 aircraft**
- RT  $\infty$  aircraft

## P-531 helicopter

- UF *Scout helicopter*
- Westland P-531 helicopter*
- GS V/STOL aircraft
  - . rotary wing aircraft
  - . . . helicopters
  - . . . military helicopters
  - . . . . **P-531 helicopter**
  - Westland aircraft
  - . **P-531 helicopter**
- RT antisubmarine warfare aircraft
  - passenger aircraft

## P-1127 aircraft

- UF *Hawker P-1127 aircraft*
- Kestrel aircraft*
- VZ-12 aircraft*
- XV-6A aircraft*
- GS attack aircraft
  - . fighter aircraft
  - . . . **P-1127 aircraft**
  - Hawker Siddeley aircraft
  - . **P-1127 aircraft**
  - jet aircraft
  - . turbofan aircraft
  - . . . **P-1127 aircraft**
  - monoplanes
  - . **P-1127 aircraft**
  - single engine aircraft
  - . **P-1127 aircraft**
  - V/STOL aircraft
  - . **P-1127 aircraft**
- RT  $\infty$  aircraft
  - Bristol-Siddeley BS 53 engine
  - Harrier aircraft
  - turbofan engines

## P-1154 aircraft

- UF *Hawker P-1154 aircraft*
- GS attack aircraft
  - . fighter aircraft
  - . . . **P-1154 aircraft**
  - Hawker Siddeley aircraft
  - . **P-1154 aircraft**
  - jet aircraft
  - . turbofan aircraft
  - . . . **P-1154 aircraft**
  - monoplanes
  - . **P-1154 aircraft**
  - single engine aircraft
  - . **P-1154 aircraft**
  - supersonic aircraft
  - . **P-1154 aircraft**
  - V/STOL aircraft
  - . **P-1154 aircraft**
- RT  $\infty$  aircraft
  - turbofan engines

## P.A.C.M. telemetry

- SN (PULSE AMPLITUDE CODE MODULATION)
- GS telecommunication
  - . telemetry
  - . . . **P.A.C.M.** telemetry
  - transmission
  - . signal transmission
  - . . . telemetry
  - . . . . **P.A.C.M.** telemetry
- RT amplitude modulation
  - communication equipment
  - differential pulse code modulation
  - modulation
  - pulse amplitude modulation

pulse code modulation

## PA-34 Seneca aircraft

- UF *Seneca aircraft*
- GS light aircraft
  - . Piper aircraft
  - . . . **PA-34 Seneca aircraft**
- RT  $\infty$  aircraft
  - ATLIT project
  - GAW-1 airfoil
  - General Dynamics aircraft

## PACE

- USE **Physics and Chemistry Experiment in Space**

## Pacific islands

- GS landforms
  - . islands
  - . . . **Pacific islands**
  - . . . Guam
  - . . . Japan
  - . . . Johnston Island
  - . . . Kurile Islands
  - . . . New Guinea (island)
  - . . . New Zealand
  - . . . Philippines
  - . . . Samoa

## Pacific Northwest (US)

- GS regions
  - . **Pacific Northwest (US)**
- RT Canada
  - United States

## Pacific Ocean

- GS oceans
  - . **Pacific Ocean**
- RT Bering Sea
  - coastal ranges (CA)
  - el Nino
  - Gulf of Alaska
  - Gulf of California (Mexico)
  - Indonesia
  - mid-ocean ridges
  - Monterey Bay (CA)
  - San Francisco Bay (CA)
  - Sea of Okhotsk
  - Southern California

## packages

DEF Any assemblies or apparatus, complete in themselves or practically so, identifiable as units and readily available for use or installation.

## GS packages

- . instrument packages
- . . . Apollo Lunar Surface Experiments Package
- . . . EASEP
- . . . EREP

## RT

- bags
- boxes (containers)
- bundles
- cartridges
- cases (containers)
- $\infty$  containers
- $\infty$  instruments
- packaging

## packaging

DEF (1) The technique of preparing goods for distribution; (2) The design criteria, processes, and procedures used to protect materials from deterioration and damage from the time manufacturing is completed until use or disposal; (3) The processes and procedures used to protect an item in a unit package.

## GS packaging

- . electronic packaging
- RT  $\infty$  containers
  - corrosion prevention
  - encapsulating
  - enclosure
  - hauling
  - hoppers
  - inhibitors
  - marking
  - materials handling

- packages
- ∞ packing
  - preserving
  - sealers
  - spiral wrapping
  - ∞ storage
  - transportation
  - vermiculite
  - weatherproofing
  - ∞ wrap
- packet switching**
- DEF Switching circuit system for multiple access time division data transmission.
- GS switching
- . **packet switching**
  - RT asynchronous transfer mode
  - beam switching
  - communication networks
  - data transmission
  - interruption
  - microwave switching
  - multiple access
  - network control
  - packet transmission
  - packets (communication)
  - protocol (computers)
  - radio transmission
  - sequencing
  - signal transmission
  - switching circuits
  - switching theory
  - telecommunication
  - time division multiple access
- packet transmission**
- DEF Transmission of bursts of digital data.
- GS telecommunication
- . **packet transmission**
  - . . Aloha system
  - transmission
  - . signal transmission
  - . . data transmission
  - . . . **packet transmission**
  - . . . . Aloha system
  - RT asynchronous transfer mode
  - automatic repeat request
  - carrier sense multiple access
  - channel capacity
  - message processing
  - packet switching
  - packets (communication)
  - satellite communication
  - spacecraft communication
  - transmission efficiency
- packets (communication)**
- DEF Digital data messages which are almost always preceded by headers (containing address information and other control characters) and followed by control characters which signify the end of a message.
- UF *bursts (communication)*
- RT Aloha system
- communication networks
  - data transmission
  - packet switching
  - packet transmission
  - transmission efficiency
  - wave packets
  - wide area networks
- ∞ **packing**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT packaging
- packing density
  - packings (seals)
  - sealing
- packing density**
- GS density (number/volume)
- . **packing density**
  - RT Bravais crystals
  - crystal structure
  - crystals
  - ∞ packing
- void ratio
- packings (seals)**
- GS seals (stoppers)
- . **packings (seals)**
  - RT bearings
  - glands (seals)
  - labyrinth seals
  - ∞ packing
  - pumps
  - sealers
  - sealing
  - shafts (machine elements)
  - valves
- ∞ **pad**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT cushions
- foundations
  - launching pads
- paddles**
- RT folding structures
- mixers
  - solar generators
  - turbomachine blades
- Pade approximation**
- GS analysis (mathematics)
- . calculus
  - . . series (mathematics)
  - . . . **Pade approximation**
  - . numerical analysis
  - . . approximation
  - . . . **Pade approximation**
  - . real variables
  - . . series (mathematics)
  - . . . **Pade approximation**
- PAGEOS satellite**
- GS artificial satellites
- . geodetic satellites
  - . . **PAGEOS satellite**
  - . passive satellites
  - . . **PAGEOS satellite**
  - RT Explorer 29 satellite
  - Explorer 36 satellite
  - GEOS 1 satellite
  - GEOS 2 satellite
  - GEOS 3 satellite
- PAH
- USE **polycyclic aromatic hydrocarbons**
- pain**
- GS perception
- . sensory perception
  - . . **pain**
  - RT analgesia
- pain sensitivity**
- GS perception
- . sensory perception
  - . . **pain sensitivity**
  - sensitivity
  - . **pain sensitivity**
- paint removal**
- (added August 1995)
- UF *paint stripping*
- GS removal
- . **paint removal**
  - RT abrasives
  - cleaning
  - solvents
  - ∞ stripping
  - surface treatment
- paint stripping*
- USE **paint removal**
- paints**
- GS coatings
- . **paints**
  - . . pressure sensitive paints
  - . . temperature sensitive paints
  - RT fillers
  - finishes
  - metal coatings
- pigments
- primers (coatings)
  - protective coatings
  - rubber coatings
  - sealers
  - sprayed coatings
  - turpentine
  - varnishes
- pair production**
- GS particle production
- . **pair production**
  - RT electromagnetic absorption
  - electron emission
  - electron photon cascades
  - electron-positron pairs
  - emission
  - high energy interactions
  - nuclear reactions
  - photoproduction
  - positron annihilation
  - positrons
- Pakistan**
- GS nations
- . **Pakistan**
  - RT Asia
  - Bangladesh
  - Himalayas
  - Pakistan space program
- Pakistan space program**
- (added November 1989)
- GS programs
- . space programs
  - . . **Pakistan space program**
  - RT Pakistan
- Palapa 2 satellite**
- UF *Palapa B satellite*
- GS artificial satellites
- . communication satellites
  - . . Palapa satellites
  - . . . **Palapa 2 satellite**
  - RT Indonesian space program
  - international cooperation
- Palapa B satellite*
- USE **Palapa 2 satellite**
- Palapa satellites**
- DEF Satellites launched by the US for the Indonesian government for their domestic communications network.
- GS artificial satellites
- . communication satellites
  - . . **Palapa satellites**
  - . . . Palapa 2 satellite
  - RT Indonesian space program
  - international cooperation
- paleobiology**
- DEF The study of life and organisms that existed in the geologic past.
- RT archaeobacteria
- ∞ biology
  - Cretaceous-Tertiary boundary
  - fossils
  - geochemistry
  - geochronology
  - paleontology
- paleoclimatology**
- DEF The study of climates in the geologic past, involving fossil, glacial, isotropic, or other data.
- GS climatology
- . **paleoclimatology**
  - RT climate
  - climate change
  - paleontology
  - primitive Earth atmosphere
- paleomagnetism**
- UF *archaeomagnetism*
- GS magnetic fields
- . **paleomagnetism**
  - magnetic properties
  - . **paleomagnetism**
  - RT archaeology

## paleontology

cones (volcanoes)  
continental drift  
geology  
geomagnetism  
geophysics  
magnetostratigraphy  
Mars volcanoes  
remanence  
rocks  
volcanoes  
volcanology

### paleontology

RT archaeobacteria  
Cambrian Period  
Cenozoic Era  
Cretaceous Period  
Cretaceous-Tertiary boundary  
formations  
fossils  
geochemistry  
geochronology  
geological surveys  
geology  
histories  
Mesozoic Era  
paleobiology  
paleoclimatology  
Paleozoic Era  
Precambrian period  
protobiology  
stratigraphy  
Tertiary Period

### Paleozoic Era

(added June 1989)

DEF An era of geologic time, from the end of the Precambrian Period to the beginning of the Mesozoic Era, or about 570 to about 225 million years ago.

GS **Paleozoic Era**  
. Cambrian Period  
RT geochronology  
Mesozoic Era  
paleontology  
Precambrian period

### palladium

GS chemical elements  
. **palladium**  
metals  
. transition metals  
. . **palladium**  
RT palladium isotopes

### palladium alloys

GS alloys  
. **palladium alloys**

### palladium compounds

RT ∞ chemical compounds  
metals  
transition metals

### palladium isotopes

GS chemical elements  
. nuclides  
. . isotopes  
. . . **palladium isotopes**  
RT palladium

### Palmar sweat index

RT perspiration  
stress (physiology)  
stress (psychology)

### Palmgren-Miner rule

UF *Miner rule*  
GS rules  
. **Palmgren-Miner rule**  
RT fatigue life

### palmitic acid

GS acids  
. carboxylic acids  
. . fatty acids  
. . . **palmitic acid**  
organic compounds  
. carboxylic acids  
. . fatty acids

. . . **palmitic acid**

RT fats

### Palo Verde Valley (CA)

GS valleys  
. **Palo Verde Valley (CA)**  
RT California  
deserts

PAM (*modulation*)

USE **pulse amplitude modulation**

### pampas

DEF A vast treeless grassy plain of temperate regions, especially as used in Argentina and adjacent parts of Uruguay. It is comparable to the prairies of North America, the steppes of the Eurasia, and the veld of South Africa.

GS land  
. plains  
. . **pampas**  
landforms  
. plains  
. . **pampas**

PAN (*polyacrylonitrile*)

USE **polyacrylonitrile**

### Panama

GS nations  
. **Panama**  
RT canals  
Central America

### Panama Canal Zone

GS regions  
. **Panama Canal Zone**  
RT Caribbean Sea  
Central America  
United States

### pancreas

GS anatomy  
. digestive system  
. . **pancreas**  
. glands (anatomy)  
. . endocrine glands  
. . . **pancreas**  
RT diabetes mellitus  
gastrointestinal system  
trypsin

### Pandora

(added July 1995)

DEF A natural satellite of Saturn, orbiting at a mean distance of 141,700 kilometers.

GS celestial bodies  
. natural satellites  
. . Saturn satellites  
. . . **Pandora**  
RT Saturn (planet)

### panel flutter

GS vibration  
. structural vibration  
. . flutter  
. . . **panel flutter**  
. . self induced vibration  
. . . **panel flutter**  
RT aerodynamic noise  
aeroelasticity  
bending vibration

### panel method (fluid dynamics)

DEF Technique for analyzing and predicting the properties and characteristics of fluid flow; sometimes called the finite element method.

GS procedures  
. **panel method (fluid dynamics)**  
RT Bernoulli theorem  
boundary layers  
computational fluid dynamics  
finite element method  
∞ flow  
flow theory  
fluid dynamics  
flux vector splitting  
gas-solid interactions  
∞ methodology  
turbulence

vortex lattice method

### panels

SN (EXCLUDES GROUPS OF PEOPLE)  
GS **panels**  
. curved panels  
. rectangular panels  
. wing panels  
RT baffles  
ceilings (architecture)  
∞ construction materials  
dividers  
flat plates  
∞ plates  
∞ sheets  
shielding  
thin plates  
walls

### panic

RT emotional factors  
emotions  
fear  
human behavior

### panoramic cameras

GS optical equipment  
. cameras  
. . **panoramic cameras**  
photographic equipment  
. cameras  
. . **panoramic cameras**  
RT camera shutters  
focusing  
lenses  
photography  
wide angle lenses

### panoramic scanning

GS scanning  
. **panoramic scanning**  
RT conical scanning  
frequency scanning  
multispectral band scanners  
radar scanning  
scanners  
searching  
surveillance

### panspermia

DEF The theory that holds that reproductive bodies of living organisms exist throughout the universe and develop wherever the environment is favorable.

RT abiogenesis  
aerospace environments  
bacteria  
biological evolution  
exobiology  
extraterrestrial life  
fungi

### PANT program

DEF The passive nosetip technology (PANT) program is an investigation of flow phenomena over reentry vehicle nosetips by the Air Force. Used for ablative nosetips and passive nosetip technology.

UF *ablated nosetips*  
*passive nosetip technology*  
GS programs  
. **PANT program**

### Pantar chondrites

GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . chondrites  
. . . . **Pantar chondrites**

*Panther aircraft*

USE **F-9 aircraft**

### papain

GS biopolymers  
. proteins  
. . enzymes  
. . . **papain**  
organic compounds  
. proteins

- .. enzymes
  - ... **papain**
- RT pepsin
- paper (material)**
  - DEF Felted or matted sheets of cellulose fibers, formed on a fine wire screen from a dilute water suspension, and bonded together as the water is removed and the sheet is dried.
  - RT boards (paper)
    - Kraft process (woodpulp)
  - ∞ materials
    - organic materials
    - webs (sheets)
    - wood
- paper chromatography**
  - GS chemical tests
    - . chemical analysis
    - .. chromatography
    - ... **paper chromatography**
  - RT gas chromatography
    - liquid chromatography
- papers**
  - GS documents
    - . **papers**
  - RT boards (paper)
    - conferences
    - fibers
  - ∞ films
    - laminates
    - literature
    - Presidential reports
    - privacy reports
  - ∞ sheets
    - webs (sheets)
- papillae**
  - RT protuberances
- Papua New Guinea**
  - GS nations
    - . **Papua New Guinea**
  - RT Asia
    - Australia
    - New Guinea (island)
- para hydrogen**
  - GS gases
    - . **para hydrogen**
  - RT hydrogen
    - ortho para conversion
- parabolas**
  - DEF Open curves where all points of which are equidistant from a fixed point called the focus, and a straight line. The limiting case occurs when the point is on the line, in which case the parabola becomes a straight line.
  - GS geometry
    - . Euclidean geometry
    - .. analytic geometry
    - ... conics
    - ... **parabolas**
- parabolic antennas**
  - GS antennas
    - . directional antennas
    - .. reflector antennas
    - ... **parabolic antennas**
  - RT antenna design
    - Cassegrain antennas
    - horn antennas
    - microwave antennas
    - radar antennas
    - radar equipment
    - radar reflectors
- parabolic bodies**
  - DEF Surfaces of revolution generated by revolving sections of parabolas about their major axis. Used for paraboloids.
  - UF *paraboloids*
  - GS symmetrical bodies
    - . bodies of revolution
- .. **parabolic bodies**
- parabolic differential equations**
  - GS analysis (mathematics)
    - . real variables
    - .. differential equations
    - ... partial differential equations
    - ... **parabolic differential equations**
  - RT ∞ equations
- parabolic flight**
  - RT ascent trajectories
    - ballistic trajectories
    - climbing flight
    - coasting flight
    - descent trajectories
  - ∞ flight
    - midcourse trajectories
    - missile trajectories
    - suborbital flight trajectories
    - weightlessness
    - weightlessness simulation
- parabolic reflectors**
  - DEF Reflecting surfaces having the cross section along the axis in the shape of a parabola. Parallel rays striking the reflector are brought to a focus at a point, or if the source of the rays is placed at the focus, the reflected rays are parallel. Used for dishes.
  - UF *dishes*
  - GS reflectors
    - . **parabolic reflectors**
    - .. paraboloid mirrors
  - RT microwave antennas
    - radar reflectors
    - reflector antennas
    - Schwarzschild antennas
    - solar reflectors
- parabolic velocity*
- USE **escape velocity**
- paraboloid mirrors**
  - GS mirrors
    - . **paraboloid mirrors**
    - .. parabolic reflectors
    - ... **paraboloid mirrors**
  - RT reflecting telescopes
    - solar reflectors
- paraboloids*
- USE **parabolic bodies**
- parachute descent**
  - UF *parachuting*
  - GS descent
    - . **parachute descent**
  - RT bailout
    - ejection
    - ejection training
    - escape (abandonment)
    - free fall
    - Mars Pathfinder
    - parachutes
- parachute fabrics**
  - GS fabrics
    - . **parachute fabrics**
  - RT Fortisan (trademark)
    - gores
    - netting (materials/structures)
    - parachutes
- parachutes**
  - DEF A device used, or intended to be used to retard the fall of a body or object through the air.
  - GS **parachutes**
    - . drag chutes
    - . parafoils
    - . recovery parachutes
    - . ribbon parachutes
    - . rotochutes
  - RT aerodynamic brakes
    - air drop operations
    - airdrops
- ballutes
- brakes (for arresting motion)
- folding structures
- parachute descent
- parachute fabrics
- paracone
- parawings
- towed bodies
- whirl towers
- parachuting*
- USE **parachute descent**
- parachuting injury**
  - GS injuries
    - . **parachuting injury**
- paracone**
  - DEF A system for recovering men and objects from great distances above the Earth's surface and landing them safely onto the Earth.
  - RT escape capsules
    - escape systems
    - parachutes
- paradoxes**
  - GS philosophy
    - . **paradoxes**
  - RT knowledge
    - ∞ logic
    - relativity
- paraffins**
  - GS organic compounds
    - . hydrocarbons
    - .. aliphatic hydrocarbons
    - ... alkanes
    - ... **paraffins**
    - ... . ceresin
  - RT hydrocarbon fuels
    - kerosene
    - shale oil
- parafoils**
  - (added July 1994)
  - GS parachutes
    - . **parafoils**
  - RT aerodynamic brakes
    - airdrops
    - bailout
    - free fall
    - paragliders
- paragliders**
  - GS gliders
    - . **paragliders**
    - .. inflatable gliders
  - RT folding structures
    - hypersonic gliders
    - parafoils
    - parawings
    - ∞ subsonic aircraft
- Paraguay**
  - GS nations
    - . **Paraguay**
  - RT South America
- parallax**
  - DEF The difference in the apparent direction or position of an object when viewed from different points expressed as an angle.
  - GS **parallax**
    - . solar parallax
    - . stellar parallax
  - RT astrometry
    - companion stars
    - ∞ optics
- parallel computers**
  - GS data processing equipment
    - . computers
    - .. digital computers
    - ... **parallel computers**
    - ... massively parallel processors
    - ... . Connection Machine
    - ... MIMD (computers)
    - ... SIMD (computers)

## parallel flow

RT hypercube multiprocessors

### parallel flow

GS fluid flow  
  . **parallel flow**  
  . . pipe flow  
  . . . three dimensional flow  
  . . . . Karman-Bodewadt flow  
  . . . . secondary flow  
RT flow geometry  
flow velocity  
laminar flow  
steady flow

### parallel plates

RT capacitors  
∞ channels  
flat plates  
metal plates  
∞ plates  
thin plates  
waveguides

### parallel processing (computers)

DEF The concurrent or simultaneous execution of more than one program, or the handling of input for more than one operation at the same time.

GS data processing  
  . **parallel processing (computers)**  
RT associative processing (computers)  
computational electromagnetics  
concurrent processing  
Connection Machine  
distributed memory  
hypercube multiprocessors  
Illiack 3 computer  
Illiack 4 computer  
interprocessor communication  
massively parallel processors  
MIMD (computers)  
response time (computers)  
SIMD (computers)  
sorting algorithms  
supercomputers  
systolic arrays  
transputers  
vector processing (computers)

### parallel programming

GS computer programming  
  . **parallel programming**  
RT multiprocessing (computers)  
pipelining (computers)

### parallel strip lines

USE **microstrip transmission lines**

### parallelepipeds

GS geometry  
  . Euclidean geometry  
  . . polyhedrons  
  . . . **parallelepipeds**

### parallelograms

GS geometry  
  . Euclidean geometry  
  . . polygons  
  . . . tetragons  
  . . . . **parallelograms**  
  . . . . . rhomboids

### paralysis

GS diseases  
  . **paralysis**  
  . . injuries  
  . . . **paralysis**  
RT disabilities  
tremors

### paramagnetic amplifiers

USE **masers**

### paramagnetic resonance

GS resonance  
  . magnetic resonance  
  . . **paramagnetic resonance**  
  . . . electron paramagnetic resonance  
RT absorption spectra  
ferromagnetic resonance

nuclear magnetic resonance  
paramagnetism

### paramagnetism

GS magnetic properties  
  . **paramagnetism**  
RT antiferromagnetism  
Curie-Weiss law  
diamagnetism  
paramagnetic resonance

### paramecia

GS animals  
  . protozoa  
  . . **paramecia**  
  . . . microorganisms  
  . . . protozoa  
  . . . **paramecia**

### parameter identification

DEF The estimation of the unknown parameters of models of physical plants or processes from their dynamic response.

GS estimating  
  . **parameter identification**  
  . . identifying  
  . . . **parameter identification**  
  . . . . parameterization  
  . . . . **parameter identification**  
RT complex systems  
control systems design  
dynamic response  
estimates  
frequency domain analysis  
genetic algorithms  
independent variables  
least squares method  
mathematical models  
maximum likelihood estimates  
observability (systems)  
optimal control  
optimization  
prediction analysis techniques  
probability theory  
sensitivity analysis  
statistical analysis  
steepest descent method  
system identification  
systems analysis  
systems engineering  
Taguchi methods  
time domain analysis

### parameterization

GS **parameterization**  
  . parameter identification  
RT algorithms  
∞ applications of mathematics  
dependent variables  
derivation  
dimensional analysis  
∞ estimators  
formalism  
formulations  
mathematical models  
scale effect  
semiempirical equations  
sensitivity analysis  
system identification  
units of measurement

### parameters

USE **independent variables**

### parametric amplifiers

DEF Inverting parametric devices used to amplify a signal without frequency translation from input to output. Used for parametric oscillators and reactance amplifiers.

UF *parametric oscillators*  
*reactance amplifiers*  
GS amplifiers  
  . **parametric amplifiers**  
RT frequency converters  
LC circuits  
magnetostatic amplifiers  
microwave amplifiers  
negative resistance devices  
power amplifiers

semiconductor devices

### parametric diodes

GS electronic equipment  
  . diodes  
  . . semiconductor diodes  
  . . . **parametric diodes**  
  . . . solid state devices  
  . . . semiconductor devices  
  . . . **parametric diodes**  
RT varactor diodes

### parametric frequency converters

GS frequency converters  
  . **parametric frequency converters**  
RT ∞ converters  
phase modulation  
up-converters

### parametric oscillators

USE **parametric amplifiers**

### parametrons

RT computer storage devices  
magnetic cores  
magnetic storage  
oscillators  
phase lock demodulators  
thin films

### paranasal sinuses

GS anatomy  
  . respiratory system  
  . . **paranasal sinuses**  
  . . . sinuses  
  . . . **paranasal sinuses**  
RT nose (anatomy)

### paraplasts

GS plasters  
  . **paraplasts**  
RT resins

### parapsychology

USE **extrasensory perception**

### parasites

GS **parasites**  
  . trypanosome  
RT animals  
blight  
infestation

### parasitic antennas

USE **parasitic elements (antennas)**

### parasitic diseases

GS diseases  
  . infectious diseases  
  . . **parasitic diseases**  
RT airborne infection  
amoeba  
blight  
rust fungi  
trypanosome

### parasitic elements (antennas)

(added July 1993)

UF *parasitic antennas*  
*parasitic reflectors*  
*passive elements*  
GS antenna components  
  . **parasitic elements (antennas)**  
  . . directors (antenna elements)  
  . . . antennas  
  . . . **parasitic elements (antennas)**  
  . . . directors (antenna elements)  
RT antenna design  
antenna radiation patterns  
dipole antennas  
directional antennas  
log periodic antennas  
radio receivers  
reflectors  
Yagi antennas

### parasitic reflectors

USE **parasitic elements (antennas)**

### parathyroid gland

GS anatomy

- . glands (anatomy)
- . . . endocrine glands
- . . . **parathyroid gland**
- RT calcium metabolism
- parawings**
- GS airfoils
- . wings
- . . flexible wings
- . . . **parawings**
- RT air drop operations
- folding structures
- hang gliders
- parachutes
- paragliders
- parenteral functions**
- RT  $\infty$  functions
- parents**
- RT adults
- children
- human beings
- parity**
- DEF A symmetry property of a wave function.
- RT BCH codes
- coding
- conservation
- correction
- CP violation
- equivalence
- error detection codes
- information theory
- nuclear physics
- particle spin
- quantum numbers
- quantum theory
- strangeness
- vector currents
- $\infty$  **parking**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT parking orbits
- ramps (structures)
- parking orbits**
- GS orbits
- . spacecraft orbits
- . . satellite orbits
- . . . **parking orbits**
- RT Earth orbits
- Earth-Moon trajectories
- flight optimization
- interplanetary trajectories
- low Earth orbits
- lunar orbits
- lunar trajectories
- orbital mechanics
- $\infty$  parking
- planetary orbits
- thrust programming
- transfer orbits
- Parkinson disease**
- GS diseases
- . **Parkinson disease**
- RT tremors
- parks**
- GS land
- . **parks**
- . . national parks
- . . . Yellowstone National Park (ID-MT-WY)
- RT recreation
- regional planning
- urban development
- urban planning
- parotid gland*
- USE **salivary glands**
- parsing algorithms**
- DEF Computer routines for the syntactic and/or semantic analysis and restructuring of natural language instructions or data for internal processing.
- GS mathematical logic
- . algorithms
- . . **parsing algorithms**
- RT compilers
- computer techniques
- grammars
- natural language processing
- semantics
- subroutines
- syntax
- partial differential equations**
- GS analysis (mathematics)
- . real variables
- . . differential equations
- . . . **partial differential equations**
- . . . . biharmonic equations
- . . . . Burger equation
- . . . . Cauchy-Riemann equations
- . . . . elliptic differential equations
- . . . . Monge-Ampere equation
- . . . . Euler-Cauchy equations
- . . . . Frowcs Williams-Hawkings equation
- . . . . Fokker-Planck equation
- . . . . Gauss equation
- . . . . Helmholtz vorticity equation
- . . . . Liouville equations
- . . . . parabolic differential equations
- . . . . Poisson equation
- . . . . vlasov equations
- RT alternating direction implicit methods
- Boltzmann-Vlasov equation
- $\infty$  equations
- Euler-Bernoulli beams
- functional integration
- kinetic equations
- Laplace equation
- meshfree methods
- method of characteristics
- Neumann problem
- reaction-diffusion equations
- Trefftz method
- wave equations
- partial pressure**
- DEF The pressure exerted by a designated component or components of a gaseous mixture.
- GS pressure
- . **partial pressure**
- . . oxygen tension
- . . . hypoxemia
- RT Dalton law
- gas pressure
- Henry law
- internal pressure
- Raoult law
- residual gas
- $\infty$  tension
- vapor pressure
- particle acceleration**
- GS rates (per time)
- . acceleration (physics)
- . . **particle acceleration**
- RT  $\infty$  acceleration
- electromagnetic acceleration
- magnetic fields
- plasma acceleration
- racetracks (particle accelerators)
- wave-particle interactions
- particle accelerator targets**
- GS targets
- . **particle accelerator targets**
- RT  $\infty$  accelerators
- target thickness
- particle accelerators**
- DEF Specifically, devices for imparting large kinetic energy to charged particles, such as electrons, protons, deuterons, and helium ions.
- GS **particle accelerators**
- . cyclic accelerators
- . . betatrons
- . . synchrocyclotrons
- . . synchrotrons
- . . . bevatron
- . . . storage rings (particle accelerators)
- . cyclotrons
- . . geocyclotrons
- . . microtrons
- . . Oak Ridge isochronous cyclotron
- . . omegatrons
- . . synchrocyclotrons
- . electron accelerators
- . . betatrons
- . ion accelerators
- . linear accelerators
- . Nimrod accelerator
- . superconducting super collider
- . synchrophasotrons
- . Van de Graaff accelerators
- RT  $\infty$  accelerators
- beam splitters
- electron guns
- elementary particles
- ion sources
- kaon production
- neutron sources
- nuclear particles
- racetracks (particle accelerators)
- railgun accelerators
- SEPAC (payload)
- particle beams**
- GS beams (radiation)
- . **particle beams**
- . . atomic beams
- . . electron beams
- . . . relativistic electron beams
- . . ion beams
- . . neutral beams
- . . . molecular beams
- . . . neutron beams
- . . . neutrino beams
- . . pion beams
- . . proton beams
- RT beam splitters
- electron acceleration
- electron bombardment
- flux (rate)
- ion stripping
- magnetic sails
- phonon beams
- particle charging**
- RT charged particles
- particle collisions**
- GS collisions
- . **particle collisions**
- RT atomic collisions
- atomic excitations
- BGK model
- dense plasmas
- Faddeev equations
- ionic collisions
- kinetics
- mean free path
- molecular collisions
- molecular excitation
- nucleon-nucleon scattering
- scattering
- particle counters*
- USE **radiation counters**
- particle decay**
- (added May 1994)
- SN (LIMITED TO THE DECAY OF ELEMENTARY PARTICLES; EXCLUDES NUCLEAR DECAY)
- GS decay
- . **particle decay**
- . . neutron decay
- RT CP violation
- elementary particle interactions
- fermions
- hadrons
- radioactive decay
- particle density (concentration)**
- GS density (number/volume)
- . **particle density (concentration)**
- . . electron density (concentration)
- . . . carrier density (solid state)
- . . . electron density profiles

## particle diffusion

- . . . ionospheric electron density
- . . . magnetospheric electron density
- . . . electron distribution
- . . . electron density profiles
- . . . ion density (concentration)
- . . . ionospheric ion density
- . . . magnetospheric ion density
- . . . . magnetospheric proton density
- . . . . proton density (concentration)
- . . . . magnetospheric proton density
- . . . plasma density

RT atmospheric density  
ESRO 4 satellite  
ion stripping  
ionospheric composition  
space density  
spatial distribution

### particle detectors

USE **radiation counters**

### particle diffusion

GS diffusion  
. **particle diffusion**  
. . . electron diffusion  
. . . ionic diffusion

RT atomic beams  
Boltzmann transport equation  
diffusion coefficient  
diffusion length  
drop size  
flux (rate)  
gaseous self-diffusion  
molecular diffusion  
muon spin rotation  
self diffusion (solid state)  
thermophoresis

### particle emission

GS emission  
. **particle emission**  
. . . electron emission  
. . . field emission  
. . . photoelectric emission  
. . . secondary emission  
. . . ion emission  
. . . neutron emission  
. . . thermionic emission

RT exhaust emission  
expulsion  
self sustained emission  
stimulated emission

### particle energy

GS **particle energy**  
. . . electron energy  
. . . electron states  
. . . proton energy

RT ∞ energy  
internal energy  
kinetic energy  
monochromatization  
∞ particle intensity

### particle flux

USE **flux (rate)**

### particle flux density

SN (LIMITED TO PARTICLE EMISSION OR  
DETECTION RATE PER UNIT AREA)

GS rates (per time)  
. flux density  
. . . radiant flux density  
. . . . **particle flux density**  
. . . . . electron flux density  
. . . . . neutron flux density  
. . . . . proton flux density

RT Helios satellites  
∞ particle intensity  
radiancy  
radiation counters  
radiation pressure  
solar constant  
solar flux density

### particle image displacement velocimetry

USE **particle image velocimetry**

### particle image velocimetry

(added June 1993)

UF *particle image displacement*

*velocimetry*

*PIDV (velocimetry)*

*PIV (velocimetry)*

GS mechanical measurement

. flow measurement

. . **particle image velocimetry**

. . velocity measurement

. . **particle image velocimetry**

RT flow distribution  
flow velocity  
flow visualization  
imaging techniques  
laser doppler velocimeters  
photographic measurement  
photographic recording  
two phase flow

### particle in cell technique

GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **particle in cell technique**

RT ∞ cells  
crystal lattices  
flow equations  
meshfree methods  
∞ methodology  
vortex in cell technique

### ∞ particle intensity

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)

RT particle energy  
particle flux density

### particle interactions

GS **particle interactions**  
. elementary particle interactions  
. . electroweak interactions (field  
theory)  
. . high energy interactions  
. . . strong interactions (field theory)  
. . meson-meson interactions  
. . meson-nucleon interactions  
. . nuclear capture  
. . . electron capture  
. . nucleon-nucleon interactions  
. . weak energy interactions  
. . . weak interactions (field theory)  
. . proton-antiproton interactions  
. ion atom interactions  
. molecular interactions  
. . molecular collisions  
. nuclear interactions  
. . nuclear capture  
. . . electron capture  
. . spin-orbit interactions  
. . . electron capture  
. . weak interactions (field theory)  
. plasma-particle interactions  
. wave-particle interactions

RT Bragg curve  
charm (particle physics)  
chemical reactions  
collision parameters  
electron phonon interactions  
electron scattering  
Feynman diagrams  
flavor (particle physics)  
∞ interactions  
neutral currents  
nuclear reactions  
photonuclear reactions  
photophoresis  
quantum chromodynamics

### particle laden jets

DEF Fluid, mainly issuing from a nozzle,  
that are turbulent and contain dispersed par-  
ticles.

RT fuel flow  
jet flow  
particles  
turbulent flow

### particle mass

GS mass  
. **particle mass**

. . electron mass

RT gravitinos

magnetic rigidity

nuclides

### particle motion

RT diffraction radiation  
electrophoresis  
falling  
lattice vibrations  
magnetic rigidity  
mean free path  
∞ motion  
neutral sheets  
photophoresis  
recoillings  
relativistic velocity  
settling  
thermophoresis  
transverse momentum

### particle precipitation

DEF The precipitation of particles other than  
electrons and protons.

GS **particle precipitation**

. electron precipitation

. proton precipitation

RT atomic structure

charged particles

∞ precipitation

### particle production

GS **particle production**

. kaon production

. pair production

. photoproduction

RT comminution

corpuscular radiation

high energy interactions

nuclear radiation

nuclear reactions

particles

radioactivity

spallation

### particle size distribution

GS size distribution

. **particle size distribution**

RT dimensions

drop size

fineness

finest

fractions

grain size

particles

particulates

precipitation particle measurement

size determination

size separation

solids flow

thermophoresis

### particle spin

GS spin

. **particle spin**

. . . electron spin

. . . isotopic spin

. . . nuclear spin

RT angular momentum

Ising model

muon spin rotation

nuclear magnetic resonance

nuclear physics

parity

quenching (atomic physics)

spin resonance

### particle telescopes

UF *electron telescopes*

*GEP telescopes*

*Goddard experiment package*

*telescope*

*proton telescopes*

GS measuring instruments

. counters

. . radiation counters

. . . **particle telescopes**

. radiation measuring instruments

. radiation counters

. . . **particle telescopes**

- telescopes
- . **particle telescopes**
- RT anticoincidence detectors
- Geiger counters
- satellite-borne instruments
- scintillation counters
- particle theory**
- RT body kinematics
- charm (particle physics)
- collision parameters
- electroweak model
- flavor (particle physics)
- grand unified theory
- Higgs bosons
- ∞ interactions
- many body problem
- plasma-particle interactions
- quark models
- standard model (particle physics)
- string theory
- supergravity
- supersymmetry
- ∞ theories
- unified field theory
- weak energy interactions
- particle tracks**
- RT chemical analysis
- core sampling
- cosmic rays
- fossils
- geochronology
- lunar rocks
- meteoroids
- nuclear particles
- radiation effects
- stratigraphy
- trace elements
- ∞ tracks
- particle trajectories**
- GS trajectories
- . **particle trajectories**
- . . electron trajectories
- RT bubble chambers
- charged particles
- electron optics
- ionizing radiation
- ∞ motion
- ∞ paths
- racetracks (particle accelerators)
- ∞ tracks
- particles**
- DEF Elementary subatomic particles such as protons, electrons or neutrons. Very small pieces of matter. In celestial mechanics, hypothetical entities which respond to gravitational forces but which exert no appreciable gravitational force on other bodies, thus simplifying orbital computations.
- GS **particles**
- . aerosols
- . . fog
- . charged particles
- . . antiprotons
- . . energetic particles
- . . . electrons
- . . . . conduction electrons
- . . . . free electrons
- . . . . high energy electrons
- . . . . . relativistic electron beams
- . . . . . hot electrons
- . . . . . N electrons
- . . . . . negatrons
- . . . . . photoelectrons
- . . . . . pi-electrons
- . . . . . polarons
- . . . . . solar electrons
- . . . nuclei (nuclear physics)
- . . . . alpha particles
- . . . . . deuterons
- . . . . . even-even nuclei
- . . . . . heavy nuclei
- . . . . . hypernuclei
- . . . . . odd-even nuclei
- . . . . . odd-odd nuclei
- . . . . . tritons
- . . . plasmas (physics)
- . . . . argon plasma
- . . . . beta particles
- . . . . boundary layer plasmas
- . . . . cold plasmas
- . . . . collisional plasmas
- . . . . . strongly coupled plasmas
- . . . . collisionless plasmas
- . . . . cosmic plasma
- . . . . cylindrical plasmas
- . . . . dense plasmas
- . . . . . plasma focus
- . . . . . strongly coupled plasmas
- . . . . electron plasma
- . . . . electron-positron plasmas
- . . . . elliptical plasmas
- . . . . helium plasma
- . . . . high temperature plasmas
- . . . . hydrogen plasma
- . . . . . deuterium plasma
- . . . . . laser plasmas
- . . . . . metallic plasmas
- . . . . . cesium plasma
- . . . . . uranium plasmas
- . . . . microplasmas
- . . . . nitrogen plasma
- . . . . nonequilibrium plasmas
- . . . . nonuniform plasmas
- . . . . oxygen plasma
- . . . . rarefied plasmas
- . . . . relativistic plasmas
- . . . . rotating plasmas
- . . . . semiconductor plasmas
- . . . . space plasmas
- . . . . . solar wind
- . . . . . stellar winds
- . . . . . stellar winds
- . . . . . dusty plasmas
- . . . . . spherical plasmas
- . . . . . thermal plasmas
- . . . . . toroidal plasmas
- . . . primary cosmic rays
- . . . solar cosmic rays
- . . . radiation belts
- . . . artificial radiation belts
- . . . inner radiation belt
- . . . outer radiation belt
- . . . proton belts
- . . . solar corpuscular radiation
- . . . solar electrons
- . . . solar neutrinos
- . . . solar neutrons
- . . . solar protons
- . . . drops (liquids)
- . . . raindrops
- . . . dust
- . . . cosmic dust
- . . . interplanetary dust
- . . . . meteoroid dust clouds
- . . . . . zodiacal dust
- . . . . . lunar dust
- . . . . . terrestrial dust belt
- . . . elementary particles
- . . . antiparticles
- . . . antineutrinos
- . . . antinucleons
- . . . antiprotons
- . . . positrons
- . . . beta particles
- . . . bosons
- . . . . alpha particles
- . . . . Higgs bosons
- . . . . mesons
- . . . . . eta-mesons
- . . . . . hyperons
- . . . . . xi hyperons
- . . . . . kaons
- . . . . . meson resonance
- . . . . . X mesons
- . . . . . muons
- . . . . . omega-mesons
- . . . . . pions
- . . . . . vector mesons
- . . . . . rho-mesons
- . . . . . sigma-mesons
- . . . . . photons
- . . . . . xi hyperons
- . . . . . deuterons
- . . . . . electron-positron pairs
- . . . fermions
- . . . baryons
- . . . hyperons
- . . . . beta particles
- . . . . boundary layer plasmas
- . . . . cold plasmas
- . . . . collisional plasmas
- . . . . . strongly coupled plasmas
- . . . . collisionless plasmas
- . . . . cosmic plasma
- . . . . cylindrical plasmas
- . . . . dense plasmas
- . . . . . plasma focus
- . . . . . strongly coupled plasmas
- . . . . electron plasma
- . . . . electron-positron plasmas
- . . . . elliptical plasmas
- . . . . helium plasma
- . . . . high temperature plasmas
- . . . . hydrogen plasma
- . . . . . deuterium plasma
- . . . . . laser plasmas
- . . . . . metallic plasmas
- . . . . . cesium plasma
- . . . . . uranium plasmas
- . . . . microplasmas
- . . . . nitrogen plasma
- . . . . nonequilibrium plasmas
- . . . . nonuniform plasmas
- . . . . oxygen plasma
- . . . . rarefied plasmas
- . . . . relativistic plasmas
- . . . . rotating plasmas
- . . . . semiconductor plasmas
- . . . . space plasmas
- . . . . . solar wind
- . . . . . stellar winds
- . . . . . stellar winds
- . . . . . dusty plasmas
- . . . . . spherical plasmas
- . . . . . thermal plasmas
- . . . . . toroidal plasmas
- . . . primary cosmic rays
- . . . solar cosmic rays
- . . . radiation belts
- . . . artificial radiation belts
- . . . inner radiation belt
- . . . outer radiation belt
- . . . proton belts
- . . . solar corpuscular radiation
- . . . solar electrons
- . . . solar neutrinos
- . . . solar neutrons
- . . . solar protons
- . . . drops (liquids)
- . . . raindrops
- . . . dust
- . . . cosmic dust
- . . . interplanetary dust
- . . . . meteoroid dust clouds
- . . . . . zodiacal dust
- . . . . . lunar dust
- . . . . . terrestrial dust belt
- . . . elementary particles
- . . . antiparticles
- . . . antineutrinos
- . . . antinucleons
- . . . antiprotons
- . . . positrons
- . . . beta particles
- . . . bosons
- . . . . alpha particles
- . . . . Higgs bosons
- . . . . mesons
- . . . . . eta-mesons
- . . . . . hyperons
- . . . . . xi hyperons
- . . . . . kaons
- . . . . . meson resonance
- . . . . . X mesons
- . . . . . muons
- . . . . . omega-mesons
- . . . . . pions
- . . . . . vector mesons
- . . . . . rho-mesons
- . . . . . sigma-mesons
- . . . . . photons
- . . . . . xi hyperons
- . . . . . deuterons
- . . . . . electron-positron pairs
- . . . fermions
- . . . baryons
- . . . hyperons



- . . . . xi hyperons
- . . . . omega-mesons
- . . . . rho-mesons
- . . . . sigma-mesons
- . . . . eta-mesons
- . . . leptons
- . . . . antineutrinos
- . . . . electrons
- . . . . . conduction electrons
- . . . . . free electrons
- . . . . . high energy electrons
- . . . . . . relativistic electron beams
- . . . . . hot electrons
- . . . . . N electrons
- . . . . . negatrons
- . . . . . photoelectrons
- . . . . . pi-electrons
- . . . . . polarons
- . . . . . solar electrons
- . . . . muons
- . . . . neutrinos
- . . . . . solar neutrinos
- . . . . positrons
- . . . meson resonance
- . . . . X mesons
- . . . neutrons
- . . . . cold neutrons
- . . . . fast neutrons
- . . . . photoneutrons
- . . . . solar neutrons
- . . . . thermal neutrons
- . . . protons
- . . . . recoil protons
- . . . . solar protons
- . . hadrons
- . . baryons
- . . . hyperons
- . . . . xi hyperons
- . . . . omega-mesons
- . . . . rho-mesons
- . . . . sigma-mesons
- . . . mesons
- . . . . eta-mesons
- . . . . hyperons
- . . . . . xi hyperons
- . . . . kaons
- . . . . meson resonance
- . . . . . X mesons
- . . . . muons
- . . . . omega-mesons
- . . . . pions
- . . . . vector mesons
- . . . . rho-mesons
- . . . . sigma-mesons
- . . hypothetical particles
- . . magnetic monopoles
- . . nucleons
- . . . gluons
- . . . gravitinos
- . . . gravitons
- . . . partons
- . . . quarks
- . . . tachyons
- . . . weakly interacting massive particles
- . flakes
- . metal particles
- . metal powder
- . . platinum black
- . . powdered aluminum
- . . . sintered aluminum powder
- . microparticles
- . mist
- . neutral particles
- . . gravitinos
- . . neutrons
- . . . cold neutrons
- . . . fast neutrons
- . . . photoneutrons
- . . . solar neutrons
- . . . thermal neutrons
- . nuclear particles
- . . antiparticles
- . . . antineutrinos
- . . . antinucleons
- . . . antiprotons
- . . . positrons
- . . beta particles
- . . bosons

- . . . alpha particles
- . . . Higgs bosons
- . . . mesons
- . . . . eta-mesons
- . . . . hyperons
- . . . . . xi hyperons
- . . . . kaons
- . . . . meson resonance
- . . . . . X mesons
- . . . . muons
- . . . . omega-mesons
- . . . . pions
- . . . . vector mesons
- . . . . rho-mesons
- . . . . sigma-mesons
- . . . photons
- . . . xi hyperons
- . . nucleons
- . . photoelectrons
- . particulates
- . . soot
- . . pollen
- . powder (particles)
- . . fines
- . . metal powder
- . . platinum black
- . . powdered aluminum
- . . . sintered aluminum powder
- . relativistic particles
- . . relativistic electron beams
- . . trapped particles
- . . magnetically trapped particles
- . . . radiation belts
- . . . . artificial radiation belts
- . . . . inner radiation belt
- . . . . outer radiation belt
- . . . . proton belts
- . . nanoparticles

RT air pollution  
chemical clouds

∞ clouds  
colloids  
deuteron irradiation  
dirt  
dispersions  
gas atomization

∞ grains  
granular materials  
grit  
ion stripping  
ions  
neutral beams  
neutron beams  
nodules  
nonpoint sources  
particle laden jets  
particle production  
particle size distribution  
positron annihilation  
precipitation particle measurement  
proton precipitation  
smoke

*particulate filters*

USE **fluid filters**

**particulate reinforced composites**

(added January 1992)

GS composite materials  
. **particulate reinforced composites**

RT metal matrix composites  
metal particles  
microparticles  
nanocomposites  
particulates  
reinforcing materials

**particulate sampling**

GS sampling  
. **particulate sampling**

RT assaying  
chemical analysis  
concentration (composition)  
identifying  
particulates

**particulates**

GS particles  
. **particulates**  
. . soot

RT aerosols  
air pollution  
air quality  
air sampling  
atmospheric composition  
combustion products  
contaminants  
dispersions  
dust  
exhaust gases  
fly ash  
grain formation  
particle size distribution  
particulate reinforced composites  
particulate sampling  
pollution control  
pollution monitoring  
smog  
smoke  
solid suspensions

∞ **partitions**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT curtains  
partitions (mathematics)  
partitions (structures)  
septum

**partitions (mathematics)**

GS analysis (mathematics)  
. combinatorial analysis  
. . **partitions (mathematics)**

RT combinations (mathematics)  
equivalence

∞ partitions  
permutations  
Voronoi diagrams

**partitions (structures)**

RT bulkheads  
curtains

∞ partitions  
thin walls  
walls

**partons**

GS particles  
. charged particles  
. . **partons**  
. elementary particles  
. . hypothetical particles  
. . . **partons**

RT hadrons  
leptons  
quark parton model  
quarks

*parts*

USE **components**

**PAS**

UF *perigee-apogee satellites*  
GS artificial satellites  
. **PAS**

RT elliptical orbits  
twenty-four hour orbits

**Pascal (programming language)**

DEF High order computer programming language developed by Niklaus Wirth originally as an educational tool to foster structured programming.

GS languages  
. programming languages  
. . **Pascal (programming language)**

RT compilers  
computer programming

**Paschen series**

GS spectra  
. radiation spectra  
. . electromagnetic spectra  
. . . line spectra  
. . . . **Paschen series**

RT absorption spectra  
atomic spectra  
electron transitions  
emission spectra  
H lines

hydrogen

**Pasiphae**

(added January 1996)

DEF A natural satellite of Jupiter orbiting at a mean distance of 23,500,000 kilometers.

GS celestial bodies  
 . natural satellites  
 . . Jupiter satellites  
 . . . **Pasiphae**

RT Jupiter (planet)

**passageways**

DEF A pass-through between non-adjacent modules or spaces.

GS **passageways**

. straits  
 . . Torres Strait  
 . transfer tunnels

RT approach  
 cavities  
 corridors  
 gaps  
 notches  
 openings  
 ∞ paths  
 roads  
 ∞ tunnels  
 underground structures  
 vestibules

**passenger aircraft**

UF *executive aircraft*

GS **passenger aircraft**

. BAC 111 aircraft  
 . BO-105 helicopter  
 . Boeing 707 aircraft  
 . Boeing 720 aircraft  
 . Boeing 727 aircraft  
 . Boeing 737 aircraft  
 . Boeing 747 aircraft  
 . Boeing 757 aircraft  
 . Boeing 767 aircraft  
 . Boeing 777 aircraft  
 . Boeing 2707 aircraft  
 . Breguet 941 aircraft  
 . C-33 aircraft  
 . C-35 aircraft  
 . C-46 aircraft  
 . Cessna 172 aircraft  
 . Cessna 205 aircraft  
 . Cessna 210 aircraft  
 . Cessna 402B aircraft  
 . CH-3 helicopter  
 . CH-46 helicopter  
 . CH-47 helicopter  
 . CH-54 helicopter  
 . Comet 4 aircraft  
 . commuter aircraft  
 . . ATR-72 aircraft  
 . CV-340 aircraft  
 . CV-440 aircraft  
 . CV-880 aircraft  
 . CV-990 aircraft  
 . DC 8 aircraft  
 . DC 10 aircraft  
 . DH 121 aircraft  
 . DH 125 aircraft  
 . DO-27 aircraft  
 . DO-28 aircraft  
 . DO-328 aircraft  
 . Electra aircraft  
 . European Airbus  
 . . A-300 aircraft  
 . . A-310 aircraft  
 . . A-320 aircraft  
 . . A-330 aircraft  
 . . A-340 aircraft  
 . . A-380 aircraft  
 . Boeing 717 aircraft  
 . F-27 aircraft  
 . F-28 helicopter  
 . F-28 transport aircraft  
 . G-1 aircraft  
 . G-222 aircraft  
 . H-19 helicopter  
 . H-53 helicopter  
 . H-56 helicopter  
 . HFB-320 aircraft  
 . HS-748 aircraft

. IL-62 aircraft  
 . IL-76 aircraft  
 . IL-86 aircraft  
 . IL-96 aircraft  
 . Jetstream aircraft  
 . L-1011 aircraft  
 . L-2000 aircraft  
 . MD 11 aircraft  
 . MD 80 aircraft  
 . Mystere 20 aircraft  
 . Mystere 50 aircraft  
 . OH-5 helicopter  
 . P-160 aircraft  
 . P-166 aircraft  
 . SE-210 aircraft  
 . T-39 aircraft  
 . TU-104 aircraft  
 . TU-124 aircraft  
 . TU-134 aircraft  
 . TU-144 aircraft  
 . TU-204 aircraft  
 . U-10 aircraft  
 . VC-10 aircraft  
 . Viscount aircraft  
 . Yak 40 aircraft  
 . YS-11 aircraft

RT air transportation

∞ aircraft

AN-22 aircraft  
 AN-24 aircraft  
 C-121 aircraft  
 cargo aircraft  
 civil aviation  
 commercial aircraft  
 DC 7 aircraft  
 E-2 aircraft  
 general aviation aircraft  
 ground effect machines  
 HC-3 helicopter  
 jet aircraft  
 light aircraft  
 light transport aircraft  
 ∞ low wing aircraft  
 Mercure aircraft  
 MH-262 aircraft  
 ∞ military aircraft  
 P-531 helicopter  
 PD-808 aircraft  
 rotary wing aircraft  
 Saab 105 aircraft  
 SC-7 aircraft  
 short haul aircraft  
 ∞ subsonic aircraft  
 supersonic aircraft  
 supersonic transports  
 transport aircraft  
 TU-154 aircraft  
 turbofan aircraft  
 turboprop aircraft  
 V/STOL aircraft  
 very large transport aircraft  
 water takeoff and landing aircraft

**passengers**

RT airline operations  
 automated guideway transit vehicles  
 automated mixed traffic vehicles  
 automated transit vehicles  
 payloads  
 rapid transit systems  
 riding quality  
 transportation

*passes*

USE **gaps (geology)**

*passivation*

USE **passivity**

*passive elements*

USE **parasitic elements (antennas)**

**passive L-band radiometers**

GS measuring instruments  
 . radiation measuring instruments  
 . . actinometers  
 . . . radiometers  
 . . . . **passive L-band radiometers**  
 RT microwave frequencies

ultrahigh frequencies

*passive nosetip technology*

USE **PANT program**

**passive satellites**

UF *reflector satellites*  
 GS artificial satellites  
 . **passive satellites**  
 . . Beacon satellites  
 . . . Beacon Explorer A  
 . . . Explorer 22 satellite  
 . . Echo satellites  
 . . . Echo 1 satellite  
 . . . Echo 2 satellite  
 . . LAGEOS (satellite)  
 . . PAGEOS satellite  
 RT active satellites  
 communication satellites  
 Echo project  
 geodetic satellites  
 navigation satellites  
 satellite laser ranging  
 synchronous satellites

**passivity**

UF *passivation*  
 RT anodizing  
 chemical attack  
 chemical properties  
 coatings  
 corrosion  
 corrosion prevention  
 corrosion resistance  
 deactivation  
 electrolysis  
 ∞ inhibition  
 inhibitors  
 oxidation  
 oxidation resistance  
 rusting  
 siliconizing

**paste (consistency)**

DEF Mixtures with characteristic soft or plastic consistencies.  
 RT mixtures

**pastes**

DEF Adhesive compositions having a characteristic plastic-type consistency, that is, high order of yield values, such as that of pastes prepared by heating a mixture of starch and water and subsequently cooling the hydrolyzed product.  
 GS adhesives  
 . **pastes**  
 RT glues  
 plasters

**pasteurizing**

GS heating  
 . **pasteurizing**  
 RT purification  
 sterilization

**patch antennas**

(added June 1997)  
 GS antennas  
 . **patch antennas**  
 RT antenna arrays  
 antenna design  
 microstrip antennas  
 microwave antennas

**patch tests**

SN (CONDITIONS FOR ASSESSING FINITE ELEMENT METHOD CONVERGENCE AND STABILITY PROPERTIES)  
 RT convergence  
 finite element method  
 hydraulic fluids  
 structural analysis  
 ∞ tests

**patent applications**

RT copyrights  
 inventions  
 licensing  
 patents  
 product development

## patent policy

- technology utilization
- patent policy**
  - GS policies
    - . **patent policy**
  - RT intellectual property
    - inventions
    - patents
    - product development
    - regulations
    - rules
- patents**
  - GS intellectual property
    - . **patents**
  - RT claiming
    - grants
    - inventions
    - patent applications
    - patent policy
- path planning*
  - USE **trajectory planning**
- Pathfinder nuclear reactor**
  - GS nuclear electric power generation
    - . nuclear power reactors
    - . . **Pathfinder nuclear reactor**
    - nuclear reactors
    - . liquid cooled reactors
    - . . water cooled reactors
    - . . . boiling water reactors
    - . . . . **Pathfinder nuclear reactor**
    - . nuclear power reactors
    - . . **Pathfinder nuclear reactor**
- pathogenesis**
  - RT cholera
    - diseases
    - pathogens
- pathogens**
  - DEF Disease-producing agents, usually referring to living organisms.
  - RT bacteria
    - Clostridium botulinum
    - pathogenesis
- pathological cell death*  
(added October 2000)
  - USE **necrosis**
- pathological effects**
  - GS **pathological effects**
    - . necrosis
  - RT biological effects
    - carbon monoxide poisoning
    - cholera
    - diseases
  - ∞ effects
    - physiological responses
    - stress (biology)
- pathology**
  - GS medical science
    - . **pathology**
    - . . human pathology
  - RT animal models
    - autopsies
    - diagnosis
    - dissection
    - hemorrhages
    - necrosis
    - radiation therapy
    - veterinary medicine
- ∞ **paths**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - UF *courses*
    - lanes*
  - RT critical path method
    - diffraction paths
    - duality principle
    - flight paths
    - ground tracks
    - mean free path
    - meteor trails
    - multipath transmission
    - network analysis
- operations research
- optical paths
- orbits
- particle trajectories
- passageways
- PERT
- routes
- sound transmission
- thermodynamics
- trajectories
- patients**
  - RT human beings
    - human pathology
    - therapy
- Patriot missile**
  - DEF Surface to air, anti-aircraft missile.
  - GS missiles
    - . surface to air missiles
    - . . **Patriot missile**
  - RT missile configurations
    - ∞ rockets
    - weapons
- patrols**
  - RT reconnaissance
- pattern distribution*
  - USE **distribution (property)**
- pattern method (forecasting)**
  - GS management methods
    - . **pattern method (forecasting)**
    - predictions
      - . forecasting
      - . . technological forecasting
      - . . . **pattern method (forecasting)**
  - RT Delphi method (forecasting)
    - estimating
    - ∞ methodology
      - operations research
      - planning
      - probe method (forecasting)
      - technology assessment
- pattern recognition**
  - DEF The identification of shapes, forms and configurations by automatic means.
  - UF *automatic pattern recognition*
    - feature extraction*
  - GS recognition
    - . **pattern recognition**
    - . . character recognition
    - . . graphology
  - RT change detection
    - clumps
    - cluster analysis
    - computer vision
    - context
    - edge detection
    - Feature Identification and Location
    - Exper
    - gray scale
    - image analysis
    - image classification
    - multisensor applications
    - optical relay systems
    - principal components analysis
    - readers
    - repetition
- pattern registration**
  - RT comparison
    - image contrast
    - image correlators
    - image motion compensation
    - image reconstruction
    - image resolution
    - imaging techniques
    - magnetic signatures
    - matching
- ∞ **patterns**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT diffraction patterns
    - distribution (property)
    - drainage patterns
    - kurtosis
- molds
- photomasks
- prototypes
- radiation distribution
- regularity
- resins
- speckle patterns
- synthetic arrays
- templates
- test pattern generators
- Widmanstätten structure
- Patterson map**
  - GS charts
    - . graphs (charts)
    - . . **Patterson map**
  - RT crystal lattices
    - crystal structure
    - lattice parameters
- Pauli exclusion principle**
  - GS mechanics (physics)
    - . quantum mechanics
    - . . **Pauli exclusion principle**
  - wave functions
  - . **Pauli exclusion principle**
  - RT atomic structure
    - exclusion
    - fermions
- pavements**
  - RT asphalt
    - coatings
    - concretes
    - foundations
    - highways
    - roads
    - runways
    - streets
- payload assist module**
  - DEF Rocket vehicle with a spinning solid-propellant motor to attain injection velocity to place payload into intended orbits from the parking orbits of the STS.
  - GS modules
    - . **payload assist module**
    - rocket vehicles
    - . **payload assist module**
  - RT instrument packages
    - payloads
    - Space Shuttle payloads
    - space transportation system
    - spaceborne experiments
- payload control**
  - DEF Execution of events involved in operating the payload and supporting systems.
  - RT ∞ control
    - payloads
    - sounding rockets
    - space shuttles
- payload delivery (STS)**
  - DEF The transport of payloads via the Space Transportation System including ground to Earth orbit delivery by the Space Shuttle and orbit to orbit delivery via orbit transfer vehicles.
  - GS delivery
    - . **payload delivery (STS)**
  - RT Advanced Launch System (STS)
    - electric power supplies
    - Multi-Purpose Logistics Modules
    - orbit insertion
    - orbit transfer vehicles
    - orbital launching
    - payloads
    - power modules (STS)
    - solar arrays
    - space transportation system
- payload deployment & retrieval system**
  - DEF System of mechanical and control devices, with associated data systems, for payload handling in space.
  - RT manipulators
    - NASA programs
    - orbit transfer vehicles
    - payloads
    - remote handling

remote manipulator system  
space shuttles  
Space Station Mobile Servicing System  
∞ systems

**payload integration**  
RT mission planning  
payload integration plan  
payloads  
Space Shuttle payloads

**payload integration plan**  
DEF Procedures providing for compatibility of spaceborne experiments with the carrier spacecraft (e.g., shuttle orbiter).  
RT payload integration payloads  
∞ plans  
Space Shuttle orbiters  
Space Shuttle payloads  
space transportation system  
spaceborne experiments

**payload mass ratio**  
GS ratios  
. mass ratios  
. . **payload mass ratio**  
RT multistage rocket vehicles  
piggyback systems  
pressure ratio  
propellant mass ratio

**payload retrieval (STS)**  
GS retrieval  
. **payload retrieval (STS)**  
RT orbit transfer vehicles  
orbital rendezvous  
payload transfer  
remote manipulator system  
space shuttles  
space transportation system  
stationkeeping

**payload stations**  
SN (THE POSITION OR MOUNTING PLACE FOR A PAYLOAD ONBOARD A ROCKET VEHICLE, SPACECRAFT, OR SPACE STATION; EXCLUDES ORBITAL STATIONS AND CREW WORKSTATIONS)  
DEF The locations in the Space Shuttles' flight decks and cargo bay at which payloads are mounted.  
GS stations  
. **payload stations**  
RT payloads  
space transportation

**payload transfer**  
DEF The in-space movement of payloads from point to point.  
RT orbital servicing  
payload retrieval (STS)  
space maintenance

**payloads**  
DEF Originally, the revenue producing portions of an aircraft's load, e.g., passengers, cargo, and mail. By extension, that which an aircraft, rocket, or spacecraft carries over and above which is necessary for the operation of the vehicle for its flight.  
GS **payloads**  
. EXPOS (Spacelab payload)  
. OSTA-2 payload  
. SEPAC (payload)  
. sortie systems  
. Space Shuttle payloads  
. . Advanced Technology Laboratory  
. . Astro missions (STS)  
. . Atmospheric General Circulation Experiment  
. . Earth radiation budget experiment  
. . Earth Viewing Applications Laboratory  
. . electromagnetic environment experiment  
. . Get Away Specials (STS)  
. . Halogen Occultation Experiment  
. . OSS-1 payload  
. . OSTA-1 payload

. . OSTA-3 payload  
. . Physics and Chemistry Experiment in Space  
. . plasma interaction experiment  
. . Spacelab  
. . X Ray Astrophysics Facility  
. space station payloads  
. Spacelab payloads  
. . AMPS (satellite payload)  
. . Atmospheric Cloud Physics Lab (Spacelab)  
. . Atmospheric General Circulation Experiment  
. . geophysical fluid flow cells  
. . Solar Cell Calibration Facility

RT aircraft performance  
aircraft specifications  
annular suspension and pointing system  
Apollo Lunar Surface Experiments Package  
asteroid capture  
EASEP  
German Infrared Laboratory  
instrument packages  
LIRTS (telescope)  
∞ loading  
loads (forces)  
passengers  
payload assist module  
payload control  
payload delivery (STS)  
payload deployment & retrieval system  
payload integration  
payload integration plan  
payload stations  
piggyback systems  
Space Processing Applications  
Rocket  
space transportation  
space tugs  
spaceborne experiments  
warheads  
∞ weight  
weight (mass)

**PBB**  
USE **polybrominated biphenyls**

**PBRE (reactors)**  
USE **pebble bed reactors**

**PCB**  
USE **polychlorinated biphenyls**

**PCM (materials)**  
USE **phase change materials**

**PCM (modulation)**  
USE **pulse code modulation**

**PCM telemetry**  
GS telecommunication  
. telemetry  
. . **PCM telemetry**  
transmission  
. signal transmission  
. . telemetry  
. . . **PCM telemetry**  
RT differential pulse code modulation  
pulse code modulation

**PD-808 aircraft**  
UF *Douglas PD-808 aircraft*  
*Piaggio-Douglas PD-808 aircraft*  
GS jet aircraft  
. **PD-808 aircraft**  
light aircraft  
. **PD-808 aircraft**  
McDonnell Douglas aircraft  
. Douglas aircraft  
. . **PD-808 aircraft**  
monoplanes  
. **PD-808 aircraft**  
Piaggio aircraft  
. **PD-808 aircraft**  
RT ∞ aircraft

passenger aircraft

**PDE (engines)**  
*(added March 2001)*  
USE **pulse detonation engines**

**PDM (modulation)**  
USE **pulse duration modulation**

**PDP 7 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 7 computer**  
RT PDP 9 computer

**PDP 8 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 8 computer**

**PDP 9 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 9 computer**  
RT PDP 7 computer

**PDP 10 computer**  
UF *System 10 computer*  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 10 computer**

**PDP 11 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11 computer**

**PDP 11/20 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11/20 computer**

**PDP 11/40 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11/40 computer**

**PDP 11/45 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11/45 computer**

**PDP 11/50 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11/50 computer**

**PDP 11/70 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 11/70 computer**

**PDP 12 computer**  
GS data processing equipment  
. computers  
. . digital computers  
. . . PDP computers  
. . . . **PDP 12 computer**

**PDP 15 computer**  
GS data processing equipment

## PDP computers

- . computers
- .. digital computers
- ... **PDP 15 computer**

### PDP computers

- GS data processing equipment
  - . computers
  - .. digital computers
  - ... **PDP computers**
    - ... PDP 7 computer
    - ... PDP 8 computer
    - ... PDP 9 computer
    - ... PDP 10 computer
    - ... PDP 11 computer
    - ... PDP 11/20 computer
    - ... PDP 11/40 computer
    - ... PDP 11/45 computer
    - ... PDP 11/50 computer
    - ... PDP 11/70 computer
    - ... PDP 12 computer

### PDRE (engines)

- (added March 2001)
- USE **pulse detonation engines**

### PDS (spectroscopy)

- (added November 1998)
- USE **photothermal deflection spectroscopy**

### PDWE (engines)

- (added March 2001)
- USE **pulse detonation engines**

### Peacekeeper missile

- USE **MX missile**

### peacetime

- RT electronic warfare
- histories
- international cooperation
- international law
- warfare

### ∞ peaks

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT apexes
- extremum values
- maxima
- mountains
- plateaus

### peaks (landforms)

- UF *pinnacles*
- GS landforms
  - . **peaks (landforms)**
    - .. Pike's Peak (CO)
- RT mountains
- orography
- topography

### pearlite

- DEF An aggregate in steel of ferrite and cementite.
- RT cementite
- ferrites
- iron alloys
- microstructure
- steels

### Pearson distributions

- GS functions (mathematics)
  - . probability density functions
  - .. **Pearson distributions**
    - statistical analysis
    - . probability density functions
    - .. **Pearson distributions**
      - statistical distributions
      - . **Pearson distributions**

### peat

- DEF Dark brown or black residuum produced from the partial decomposition and disintegration of mosses, hedges, trees, and other plants that grow in marshes and other wet places.
- GS carbonaceous materials
  - . **peat**
    - fuels

- . chemical fuels
- .. hydrocarbon fuels
- ... fossil fuels
- ... **peat**
  - organic materials
  - . **peat**
    - resources
    - . Earth resources
    - . fossil fuels
    - ... **peat**
- RT coal
- sediments

### pebble bed reactors

- UF *PBRE (reactors)*
- GS nuclear reactors
  - . **pebble bed reactors**
    - reactor design
    - reactor technology
- RT

### Peclet number

- DEF A nondimensional number arising in problems of heat transfer in fluids.
- GS dimensionless numbers
  - . **Peclet number**
    - ratios
    - . **Peclet number**
      - advection
      - heat transfer
      - Prandtl number
      - Reynolds number
      - thermal diffusion
- RT

### peculiar galaxies

- (added November 1988)
- GS celestial bodies
  - . galaxies
  - .. **peculiar galaxies**
    - RT elliptical galaxies
    - galactic structure
    - spiral galaxies

### peculiar stars

- DEF Stars with spectra that cannot be conveniently fitted into any of the standard spectral classifications. They are denoted by a "p" after their spectral type.
- GS celestial bodies
  - . stars
  - .. **peculiar stars**
    - ... shell stars
    - ... Sigma Orionis
    - ... symbiotic stars
- RT A stars
- B stars
- hot stars
- magnetic stars
- stellar spectra
- stellar spectrophotometry
- stellar structure

### pedals

- RT levers
- manual control

### Pedersen currents

- (added December 2001)
- DEF Ionic currents flowing parallel to ionospheric conductive electric fields.
- GS electric current
  - . ionospheric currents
  - .. **Pedersen currents**
    - electricity
    - . atmospheric electricity
    - .. ionospheric currents
    - ... **Pedersen currents**
      - ion currents
      - . **Pedersen currents**
        - RT auroral zones
        - Birkeland currents
        - electric fields
        - field aligned currents

Hall effect

### pediments

- USE **piedmonts**

### pediplains

- USE **piedmonts**

### pedology

- USE **soil science**

### PEEK

DEF A class of semicrystalline polymers called polyethylene ethers for use as molding compounds and for use as composite matrix materials. Used for polyetheretherketones.

UF *polyetheretherketones*

GS plastics

. synthetic resins

.. polyether resins

... **PEEK**

.. thermoplastic resins

... **PEEK**

resins

. synthetic resins

.. polyether resins

... **PEEK**

.. thermoplastic resins

... **PEEK**

RT carbon fiber reinforced plastics

ethers

ketones

polymer matrix composites

resin matrix composites

### peeling

- RT adhesion
- cutting
- debonding (materials)
- delaminating
- flaking
- mechanical properties
- shedding
- ∞ stripping

### peening

- GS metal finishing
  - . **peening**
    - .. shot peening
- RT cold working
- hardening (materials)
- metal working
- work hardening

### Pegasus air-launched booster

- (added May 1990)
- GS launch vehicles
  - . **Pegasus air-launched booster**
    - rocket vehicles
    - . multistage rocket vehicles
    - .. **Pegasus air-launched booster**
- RT air launching
- B-52 aircraft
- X-43 vehicle

### Pegasus computer

- GS data processing equipment
- . computers
- .. **Pegasus computer**

### Pegasus engine

- USE **Bristol-Siddeley BS 53 engine**

### Pegasus satellites

- GS artificial satellites
  - . **Pegasus satellites**
    - RT Saturn project

### pelagic zone

- GS regions
  - . **pelagic zone**
    - RT oceanography

### pellets

- RT briquets
- fuel capsules
- granular materials
- nuclear fuels

- ∞ shot
- pellicle**  
RT thin films
- pelomyxa**  
GS animals  
. protozoa  
. . . amoeba  
. . . . **pelomyxa**  
microorganisms  
. protozoa  
. . . amoeba  
. . . . **pelomyxa**
- Peltier effects**  
DEF The effects which result in the production or absorption of heat at the junction of two metals on the passage of an electrical current.  
RT ∞ effects  
Seebeck effect  
temperature effects  
thermocouples  
thermoelectric cooling  
thermoelectricity  
thermophysical properties
- pelvis**  
GS anatomy  
. musculoskeletal system  
. . . bones  
. . . . **pelvis**  
RT girdles
- penalties**  
GS law (jurisprudence)  
. public law  
. . . **penalties**  
RT air law  
disciplining  
judgments  
legal liability  
liabilities  
prohibition  
regulations
- penalty function**  
DEF In mathematics, a function used in treating maxima and minima problems subject to restraints.  
GS functions (mathematics)  
. **penalty function**  
RT constraints  
∞ functions  
maxima  
minima  
optimization
- pencil beams**  
GS beams (radiation)  
. **pencil beams**  
RT antenna design  
antenna radiation patterns  
radar beams
- pendulous gyroscopes*  
USE **gyroscopic pendulums**
- pendulums**  
GS oscillators  
. mechanical oscillators  
. . . **pendulums**  
. . . . gyroscopic pendulums  
RT accelerometers  
gravitation  
momentum  
oscillations  
timing devices
- penetrants**  
RT ∞ agents  
preservatives  
retardants
- penetrating particles*  
USE **corpuscular radiation**
- penetration**  
DEF The depths to which one material extends into or penetrates another.  
RT diffusion
- drilling  
fragmentation  
hydrodynamic ram effect  
impact  
nuclear vulnerability  
percolation  
perforating  
permeability  
permeating  
piercing  
∞ saturation  
seepage  
terminal ballistics  
terrain following  
vulnerability
- penetration ballistics*  
USE **terminal ballistics**
- penetrometers**  
DEF Simple devices for measuring the penetrating power of a beam of x rays or other penetrating radiation by comparing transmission through various absorbers.  
GS measuring instruments  
. **penetrometers**  
RT lunar soil
- penicillin**  
GS drugs  
. antibiotics  
. . . **penicillin**
- Peninsular Ranges (CA)**  
GS landforms  
. mountains  
. . . **Peninsular Ranges (CA)**  
RT California
- peninsulas**  
DEF Elongated bodies or stretches of land nearly surrounded by water and connected with a larger land area, usually by a neck or an isthmus. The term is derived from the Latin 'paeninsula' "almost island."  
GS landforms  
. **peninsulas**  
. . . Delmarva Peninsula (DE-MD-VA)  
RT isthmuses  
land  
water
- Penning discharge**  
DEF A direct current discharge where electrons are forced to oscillate between two opposed cathodes and are restrained from going to the surrounding anode by the presence of a magnetic field.  
GS electric current  
. electric discharges  
. . . **Penning discharge**  
RT electrodeless discharges  
gas ionization  
ion motion  
plasma generators
- Penning effect**  
DEF An increase in the effective ionization rate of a gas due to the presence of a small number of foreign metastable atoms.  
RT ∞ effects  
gas ionization  
laser cooling  
metastable atoms
- Penning gages**  
GS measuring instruments  
. pressure gages  
. . . vacuum gages  
. . . . ionization gages  
. . . . **Penning gages**  
vacuum apparatus  
. vacuum gages  
. . . ionization gages  
. . . **Penning gages**
- Pennsylvania**  
GS nations  
. United States  
. . . **Pennsylvania**
- RT Allegheny Plateau (US)  
Delaware Bay (US)  
Delaware River Basin (US)  
Ohio River (US)  
Susquehanna River Basin  
(MD-NY-PA)
- ∞ **pens**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
UF *styluses*  
RT enclosures  
recording instruments
- pentaboranes**  
GS boron compounds  
. boron hydrides  
. . . boranes  
. . . . **pentaboranes**  
hydrogen compounds  
. hydrides  
. . . boron hydrides  
. . . . boranes  
. . . . . **pentaboranes**
- pentachlorides*  
USE **chlorides**
- pentacerythritol tetranitrate*  
USE **PETN**
- pentanes**  
GS organic compounds  
. hydrocarbons  
. . . aliphatic hydrocarbons  
. . . . alkanes  
. . . . . **pentanes**  
. . . . . neopentane
- pentanone**  
GS ketones  
. **pentanone**  
organic compounds  
. **pentanone**  
RT acetone  
acetylacetone
- pentobarbital**  
RT drugs  
narcotics  
sedatives
- pentobarbital sodium**  
GS drugs  
. **pentobarbital sodium**  
. . . reserpine  
RT Nembutal (trademark)
- pentodes**  
RT electron tubes  
semiconductor devices  
tetrodes  
transistors  
vacuum tubes
- pentolite**  
GS explosives  
. **pentolite**  
propellants  
. **pentolite**
- pentose**  
GS organic compounds  
. carbohydrates  
. . . sugars  
. . . . monosaccharides  
. . . . . **pentose**  
. . . . . ribose  
. . . . . xylose
- penumbras**  
GS shadows  
. **penumbras**  
RT eclipses  
umbras
- PEOLE satellites**  
GS artificial satellites  
. French satellites  
. . . **PEOLE satellites**

## peppers

RT geophysical satellites

Peoples Democratic Republic of Germany  
USE **East Germany**

### peppers

RT ∞ food

### pepsin

GS biopolymers  
. proteins  
. . enzymes  
. . . **pepsin**  
organic compounds  
. proteins  
. . enzymes  
. . . **pepsin**  
RT papain

### peptides

GS organic compounds  
. **peptides**  
. . polypeptides  
. . . angiotensins  
. . . glutathione  
. . . hypertensin  
. . vasopressins  
RT amino acids  
aspartic acid  
proteins

### percentage

USE **ratios**

### perception

GS **perception**  
. binaural hearing  
. motion perception  
. sensory perception  
. . auditory perception  
. . consciousness  
. . extrasensory perception  
. . kinesthesia  
. . olfactory perception  
. . pain  
. . pain sensitivity  
. . proprioception  
. . . autokinesis  
. . taste  
. . touch  
. . . tactile discrimination  
. . vertical perception  
. . vibration perception  
. . visual perception  
. . . critical flicker fusion  
. . . space perception  
. . . . autokinesis  
. . . visual discrimination  
. gravity perception  
. sound localization  
RT acuity  
adaptation  
artificial intelligence  
character recognition  
cognition  
color  
contrast  
electrocutaneous communication  
frequency response  
identifying  
illusions  
images  
information processing (biology)  
∞ interpretation  
knowledge  
legibility  
monocular vision  
perceptual time constant  
reading  
resolution  
retinal adaptation  
sensitivity  
sensory deprivation  
sensory feedback  
situational awareness  
symbols  
thresholds (perception)  
visibility

vision

### perceptrons

USE **self organizing systems**

### perceptual errors

DEF Deviations from accuracy in the perception of objects, shapes, colors, weights, etc., through the use of the senses.  
RT display devices  
visual perception  
visual stimuli

### perceptual time constant

GS constants  
. time constant  
. . **perceptual time constant**  
RT perception  
reaction time  
sense organs  
sensorimotor performance  
velocity

### perchlorates

GS halogen compounds  
. chlorine compounds  
. . **perchlorates**  
. . . aluminum perchlorates  
. . . ammonium perchlorates  
. . . hydrazine perchlorates  
. . . hydrogen perchlorate  
. . . hydroxylammonium perchlorates  
. . . lithium perchlorates  
. . . magnesium perchlorates  
. . . nitronium perchlorate  
. . . potassium perchlorates  
RT chlorates  
perchloric acid

### perchloric acid

GS acids  
. **perchloric acid**  
RT perchlorates

### perchloryl fluorides

GS halogen compounds  
. fluorine compounds  
. . fluorides  
. . . **perchloryl fluorides**  
. halides  
. . fluorides  
. . . **perchloryl fluorides**

### percolation

RT beds (process engineering)  
concentrating  
diffusion  
extraction  
filtration  
interstices  
leaching  
lysimeters  
penetration  
permeability  
permeating  
seepage  
∞ separation  
voids

### Percus method

RT flow equations  
integral equations  
∞ methodology

### percussion

RT detonation  
impact  
physical examinations  
primers (explosives)

### perfect gas

USE **ideal gas**

### perfectly matched layers

(added July 1998)  
DEF In the area of computational electromagnetism, an absorbing boundary condition used for terminating infinite domain calculations in the finite-difference time-domain (FDTD) or finite element methods. The approach has also

been extended to the analysis of some problems in acoustics.

UF **PML (electromagnetism)**  
conditions

GS . boundary conditions  
. . **perfectly matched layers**  
RT computational electromagnetics  
computational grids  
electromagnetic absorption  
electromagnetic scattering  
finite difference theory  
finite element method  
Maxwell equation

### perfluoro compounds

GS **perfluoro compounds**  
. perfluoroalkane  
. perfluoroguanidine

### perfluoroalkane

GS halogen compounds  
. fluorine compounds  
. . fluoro compounds  
. . . difluoro compounds  
. . . . **perfluoroalkane**  
. . . fluorine organic compounds  
. . . . **perfluoroalkane**  
organic compounds  
. fluorine organic compounds  
. . **perfluoroalkane**  
perfluoro compounds  
. **perfluoroalkane**

### perfluoroguanidine

GS halogen compounds  
. fluorine compounds  
. . fluoro compounds  
. . . fluorine organic compounds  
. . . . **perfluoroguanidine**  
organic compounds  
. fluorine organic compounds  
. . **perfluoroguanidine**  
perfluoro compounds  
. **perfluoroguanidine**  
RT guanidines

### perforated plates

GS structural members  
. plates (structural members)  
. . **perforated plates**  
RT anisotropic plates  
cavities  
hole geometry (mechanics)  
holes (mechanics)  
openings  
∞ perforation  
porous boundary layer control  
stress concentration

### perforated shells

GS shells (structural forms)  
. **perforated shells**  
RT arches  
cavities  
enclosures  
fairings  
hole distribution (mechanics)  
hole geometry (mechanics)  
holes (mechanics)  
housings  
hulls (structures)  
membrane structures  
nacelles  
∞ perforation  
pressure vessel design  
rocket engine cases  
shell theory  
stress concentration

### perforating

RT burnthrough (failure)  
cutting  
drilling  
formations  
fracturing  
gas injection  
injection  
metal cutting  
metal working  
penetration

- ∞ perforation  
piercing  
water injection
- ∞ **perforation**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cavities  
holes (mechanics)  
perforated plates  
perforated shells  
perforating  
piercing
- ∞ **performance**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aircraft performance  
astronaut performance  
comfort  
complexity  
computer systems performance  
consistency  
efficiency  
effort  
environments  
evaluation  
examination  
fatigue (biology)  
figure of merit  
flight characteristics  
human factors engineering  
human performance  
long term effects  
mental performance  
modulation transfer function  
observation  
operator performance  
optical transfer function  
output  
performance tests  
pilot performance  
postflight analysis  
propulsion system performance  
quality  
ratings  
reliability  
spacecraft performance  
standards  
task complexity  
training evaluation
- performance prediction**  
GS predictions  
. **performance prediction**  
RT evaluation  
management  
prediction analysis techniques  
reliability  
reliability analysis  
reliability engineering  
trend analysis
- performance tests**  
SN (APPLY ONLY TO OPERATING EQUIPMENT)  
RT accelerated life tests  
acceptability  
certification  
checkout  
computer systems performance  
field tests  
hardware-in-the-loop simulation  
inspection  
∞ performance  
space vehicle checkout program  
specifications  
standards  
∞ tests
- perfusion*  
USE **diffusion**
- pericase**  
GS chalcogenides  
. oxides  
. . . metal oxides  
. . . . alkaline earth oxides  
. . . . . magnesium oxides  
. . . . . **pericase**
- magnesium compounds  
. magnesium oxides  
. . **pericase**
- peridotite**  
UF *kimberlite*  
GS rocks  
. igneous rocks  
. . **peridotite**  
RT chromites  
dunite  
olivine  
regolith  
soils
- perigee-apogee satellites*  
USE **PAS**
- perigees**  
DEF Those orbital points nearest the Earth when the Earth is the center of attraction.  
GS apsides  
. **perigees**  
RT apogees  
Earth orbits  
elliptical orbits  
orbits  
perilunes
- perihelions**  
DEF Those points in solar orbits which are nearest the sun.  
GS apsides  
. **perihelions**  
RT aphelions  
elliptical orbits  
orbital elements  
orbits  
solar orbits
- perilunes**  
GS apsides  
. **perilunes**  
RT lunar orbits  
lunar satellites  
perigees
- period doubling**  
DEF The bifurcation of a nonlinear system to two stable periodic cycles on its route to chaotic turbulence.  
GS branching (mathematics)  
. **period doubling**  
RT chaos  
periodic functions  
transition flow  
turbulence  
turbulent flow
- period equations*  
USE **periodic functions**
- periodic functions**  
UF *period equations*  
GS analysis (mathematics)  
. real variables  
. . **periodic functions**  
. . . trigonometric functions  
. . . . cosine series  
. . . . sine series  
. . . . tangents  
functions (mathematics)  
. transcendental functions  
. . **periodic functions**  
. . . trigonometric functions  
. . . . cosine series  
. . . . sine series  
. . . . tangents  
RT Floquet theorem  
Fourier analysis  
period doubling
- periodic orbits*  
USE **orbits**
- periodic processes*  
USE **cycles**
- periodic variations**  
UF *periodicity*  
GS variations
- . **periodic variations**  
. . alternations  
. . annual variations  
. . diurnal variations  
. . intraseasonal variations  
. . nocturnal variations  
. . secular variations  
. . . Madden-Julian Oscillation  
. . quasi-biennial oscillation  
RT autocorrelation  
cataclysmic variables  
climatology  
cycles  
dendrochronology  
el Nino  
extrapolation  
Fourier analysis  
long term effects  
oscillations  
oscillators  
polar wandering (geology)  
regularity  
∞ rhythm  
semiregular variable stars  
Southern Oscillation  
trends  
variability  
variable stars
- periodicals**  
UF *journals (documents)*  
GS documents  
. **periodicals**  
RT ∞ journals  
records
- periodicity*  
USE **periodic variations**
- periodicity (biology)*  
USE **rhythm (biology)**
- peripheral circulation**  
GS circulation  
. blood circulation  
. . **peripheral circulation**
- peripheral equipment (computers)**  
SN (EXCLUDES COMPUTER-CONTROLLED EQUIPMENT)  
DEF Equipment that works in conjunction with a computer but is not part of the computer itself. Card or paper-tape readers or punches, magnetic tape handlers, or line printers are among items of peripheral equipment.  
UF *auxiliary equipment (computers)*  
GS computer components  
. **peripheral equipment (computers)**  
. . printers (data processing)  
. . remote consoles  
data processing equipment  
. **peripheral equipment (computers)**  
. . printers (data processing)  
. . remote consoles  
RT analog to digital converters  
computer storage devices  
computer systems design  
data processing  
digital to analog converters  
∞ equipment  
magnetic disks  
magnetic tapes  
modems  
plotters
- peripheral jet flow**  
GS fluid flow  
. jet flow  
. . **peripheral jet flow**  
RT downwash  
ground effect (aerodynamics)  
ground effect machines  
lift augmentation
- peripheral nervous system**  
GS anatomy  
. nervous system  
. . **peripheral nervous system**  
RT neuromuscular transmission



## peripheral vision

∞ systems

### peripheral vision

GS vision  
. **peripheral vision**  
RT space perception  
visual acuity  
visual fields

### peripheries

USE **boundaries**

### periscopes

DEF Optical instruments which displace the line of sight parallel to itself to permit a view which may otherwise be obstructed.

GS optical equipment  
. **periscopes**  
RT binoculars  
eyepieces  
optical measuring instruments  
telescopes  
viewing

### peritoneum

GS anatomy  
. **peritoneum**  
membranes  
. **peritoneum**  
RT abdomen  
epithelium  
tissues (biology)  
viscera

### permafrost

DEF Any soil, subsoil or other surficial deposit, or even bedrock, occurring in arctic or subarctic regions at a variable depth beneath the Earth's surface in which a temperature below freezing has existed continuously for a long time. Used for frozen soils.

UF *frozen soils*  
GS soils  
. **permafrost**  
RT aufeis (ice)  
Earth cryosphere  
planetary cryospheres  
polar regions

### Permalloys (trademark)

GS alloys  
. **Permalloys (trademark)**  
magnetic materials  
. ferromagnetic materials  
. **Permalloys (trademark)**  
RT iron alloys  
magnets  
molybdenum alloys  
nickel alloys  
permanent magnets

### permanent magnets

GS magnets  
. **permanent magnets**  
RT ferrimagnets  
ferromagnetic materials  
magnetic materials  
Permalloys (trademark)

### permanganates

GS manganese compounds  
. **permanganates**  
RT manganese ions

### permeability

SN (EXCLUDES MAGNETIC PERMEABILITY)  
DEF Of a magnetic material, the ratio of the magnetic induction to the magnetic field intensity in the same region. The ability to permit penetrations or passage. In this sense the term is applied particularly to substances which permit penetration or passage of fluids.

GS **permeability**  
. dielectric permeability  
RT aquifers  
density (mass/volume)  
diffusion  
diffusivity  
drainage  
formations

infiltration  
interstices  
leaching  
leakage  
mechanical properties  
penetration  
percolation  
permeating  
∞ physical properties  
porosity  
∞ resistance  
seepage  
surface properties  
void ratio  
voids  
wettability

### permeating

RT ∞ absorption  
desorption  
dialysis  
diffusion  
dispersing  
impregnating  
osmosis  
penetration  
percolation  
permeability  
porosity  
reverse osmosis  
∞ saturation  
sorption  
transpiration

### permissivity

RT compatibility  
psychological factors

### permittivity

UF *dielectric constant*  
GS electrical properties  
. dielectric properties  
. **permittivity**  
RT dielectric loss  
electric fields  
field strength

### permutations

GS analysis (mathematics)  
. combinatorial analysis  
. **permutations**  
RT ∞ combination  
combinations (mathematics)  
partitions (mathematics)  
set theory

### perovskites

DEF Minerals with a close-packed lattice and the general formula ABX<sub>3</sub> where A and B are metals and X is a nonmetal, usually O.

GS calcium compounds  
. **perovskites**  
minerals  
. **perovskites**  
titanium compounds  
. titanates  
. **perovskites**

### peroxides

GS chalcogenides  
. oxides  
. anhydrides  
. **peroxides**  
. . . . inorganic peroxides  
. . . . hydrogen peroxide  
. . . . organic peroxides  
. . . . potassium peroxides  
. . . . sodium peroxides  
RT dioxides

### Perseid meteoroids

GS celestial bodies  
. meteoroid showers  
. **Perseid meteoroids**  
. meteoroids  
. **Perseid meteoroids**

### Pershing missile

GS missiles  
. ballistic missiles

. . **Pershing missile**  
. surface to surface missiles  
. **Pershing missile**  
RT multistage rocket vehicles  
solid propellant rocket engines

### Persian Gulf

GS gulfs  
. **Persian Gulf**  
RT inlets (topography)

### personal computers

GS data processing equipment  
. computers  
. . . digital computers  
. . . . microcomputers  
. . . . **personal computers**  
. . . . . IBM personal computers  
. . . . . Macintosh personal computers  
RT computer techniques  
VSAT (network)

### personality

RT depersonalization  
personnel selection

### personality tests

RT intelligence tests  
psychological tests  
psychometrics  
qualifications  
∞ tests

### personnel

GS **personnel**  
. air traffic controllers (personnel)  
. crews  
. . . flight crews  
. . . spacecrews  
. enemy personnel  
. engineers  
. flying personnel  
. . . astronauts  
. . . orbital workers  
. . . cosmonauts  
. . . flight crews  
. . . spacecrews  
. . . pilots (personnel)  
. . . aircraft pilots  
. . . . test pilots  
. . . ground crews  
. instructors  
. medical personnel  
. . . flight nurses  
. . . physicians  
. . . surgeons  
. . . flight surgeons  
. navigators  
. operators (personnel)  
. . . pilots (personnel)  
. . . aircraft pilots  
. . . . test pilots  
. military personnel  
. police  
. programmers  
. scientists  
RT ∞ complement  
consulting  
crew experiment stations  
crew observation stations  
crew workstations  
depersonalization  
deployment  
employee relations  
∞ estimators  
helmet mounted displays  
human resources  
incentives  
inhabitants  
manpower  
occupation  
organizing  
position (title)  
qualifications  
research management  
resources  
retirement  
retraining  
services  
unionization

wage surveys

**personnel development**

- RT ∞ development
- employee relations
- human resources
- management
- resources
- training analysis

**personnel management**

- GS management
  - . industrial management
  - . . **personnel management**
- RT employee relations
- human relations
- human resources
- leadership
- management planning

*personnel propulsion systems*

USE **self maneuvering units**

**personnel selection**

- GS selection
  - . **personnel selection**
  - . . pilot selection
- RT aptitude
- employment
- intelligence tests
- labor
- personality
- physical examinations
- physiological tests

**personnel subsystems**

- RT industries

**Perspex (trademark)**

- GS plastics
  - . **Perspex (trademark)**

**perspiration**

- UF *sweating*
- RT body fluids
- body temperature
- evaporation
- excretion
- feces
- heat acclimatization
- humidity
- Palmar sweat index
- skin (anatomy)
- sweat
- transpiration

**PERT**

- UF *program evaluation review technique*
- RT commerce
- contract management
- critical path method
- GERT
- management analysis
- management methods
- management planning
- ∞ paths
- program trend line analysis
- project management

**perturbation**

DEF Any departure introduced into an assumed steady state of a system, or a small departure from a nominal path such as a desired trajectory. Usually used as equivalent to small perturbation. Specifically, a disturbance in the regular motion of a celestial body, the result of a force additional to that which causes the regular motion, specifically a gravitational force.

- GS **perturbation**
  - . orbit perturbation
  - . . satellite perturbation
- RT ∞ disturbances
- four body problem
- geodesy
- gravitational instability
- long term effects
- many body problem
- nutaton
- orbital mechanics
- oscillations

- oscillators
- radiation pressure
- Schach effect
- three body problem
- two body problem
- variations

**perturbation theory**

- UF *disturbance theory*
- GS **perturbation theory**
  - . vinti theory
- RT Boussinesq approximation
- celestial mechanics
- disturbing functions
- Hansen lunar theory
- Hartree approximation
- Hill lunar theory
- Hill method
- many body problem
- operators (mathematics)
- orbit perturbation
- orbital elements
- quantum theory
- strange attractors
- Taylor instability
- ∞ theories
- von Zeipel method
- wave functions
- Wentzel-Kramer-Brillouin method
- Yang-Mills fields
- Yang-Mills theory

**Peru**

- GS nations
  - . **Peru**
- RT South America

**perveance**

DEF The quotient of the space-charge-limited cathode current by the three-halves power of the anode voltage in a diode. Note: Perveance is the constant G appearing in the Child-Langmuir-Schottky equation.

- GS ratios
  - . **perveance**
- RT Child-Langmuir law
- space charge
- thermionic diodes
- vacuum tubes
- work functions

**pesticides**

- GS poisons
  - . **pesticides**
  - . . insecticides
  - . . . Carbamates (tradename)
  - . . . . urethanes
  - . . . DDT
  - . . . dieldrin
  - . . . phenothiazines
- RT crop dusting
- environmental chemistry
- toxicology

**petals**

- RT plants (botany)

**petechia**

- GS hemorrhages
  - . **petechia**
- RT skin (anatomy)

**PETN**

- UF *pentaerythritol tetranitrate*
- GS esters
  - . organic nitrates
  - . . **PETN**
  - nitrogen compounds
  - . nitrates
  - . . organic nitrates
  - . . . **PETN**
- RT explosives

**Petrel sounding rocket**

- GS rocket vehicles
  - . sounding rockets
  - . . **Petrel sounding rocket**

RT ∞ rockets

**Petri nets**

DEF Abstract, formal models of the information flow in systems with discrete sequential or parallel events. The major use has been the modeling of hardware systems and software concepts of computers.

- GS models
  - . mathematical models
  - . . **Petri nets**
  - networks
    - . **Petri nets**
- RT consecutive events
- dynamic models
- graphs (charts)
- information theory
- ∞ nets
  - sequencing
  - trees (mathematics)

**petrogenesis**

*(added August 1997)*

DEF Branch of petrology dealing with the origin and formation of rocks, particularly igneous rocks.

- UF *petrogeny*
- GS geology
  - . petrology
  - . . **petrogenesis**
- RT geochronology
- igneous rocks
- magma
- meteorite parent bodies
- mineralogy
- ∞ origins
  - petrography
  - volcanology

*petrogeny*

*(added August 1997)*

USE **petrogenesis**

**petrography**

- GS geology
  - . petrology
  - . . **petrography**
- RT inliers (landforms)
- petrogenesis
- rocks
- sedimentary rocks
- siderophile elements

*petroleum*

USE **crude oil**

**petroleum products**

DEF Materials derived from petroleum, natural gas, and asphalt deposits. Includes gasolines, diesel and heating fuels, lubricants, waxes, greases, petroleum coke, petrochemicals, and sulfur.

- GS products
  - . **petroleum products**
  - . . asphalt
  - . . diesel fuels
  - . . gasoline
  - . . tars
- RT butanes
- crude oil
- greases
- kerogen
- lubricants
- lubricating oils
- methane
- natural gas
- oils
- plastics
- polynuclear organic compounds

**petrology**

DEF That branch of geology dealing with the origin, occurrence, structure, and history of rocks, especially igneous and metamorphic rocks.

- GS geology
  - . **petrology**
  - . . lithology
  - . . petrogenesis
  - . . petrography

## Pfaff equation

RT cones (volcanoes)  
formations  
geochemistry  
geological surveys  
geophysics  
impact melts  
inliers (landforms)  
Mars volcanoes  
mineralogy  
rocks  
stratigraphy  
volcanoes  
volcanology

### Pfaff equation

GS analysis (mathematics)  
. **Pfaff equation**  
RT differential equations  
∞ equations  
thermodynamics

### PFM (modulation)

USE **pulse frequency modulation**

### pH

RT acid base equilibrium  
acid rain  
acidity  
acidosis  
alkalinity  
alkalosis  
bases (chemical)  
buffers (chemistry)  
hydrogen ions

### pH factor

RT acid base equilibrium  
acidosis  
alkalosis  
hydrogen ions  
ion concentration  
soil sampling

### Phaethon (hypothetical planet)

(added June 1998)

USE **hypothetical planets**

### phantastrons

GS circuits  
. delay circuits  
. . **phantastrons**  
oscillators  
. relaxation oscillators  
. . **phantastrons**  
RT feedback amplifiers

### Phantom aircraft

USE **F-4 aircraft**

### pharmacology

GS medical science  
. **pharmacology**  
. . psychopharmacology  
RT anesthesiology  
antiradiation drugs  
bioavailability  
bioprocessing  
cyclic AMP  
drugs  
∞ medicine  
motion sickness drugs  
vasoconstrictor drugs  
veterinary medicine

### pharynx

GS anatomy  
. respiratory system  
. . **pharynx**

### phase angle

USE **phase shift**

### phase change materials

DEF Materials undergoing solid/liquid phase transformations and whose latent heat of fusion properties are used to store and deliver thermal energy, usually solar energy. Used for PCM (materials).

UF *PCM (materials)*

RT ceresin  
condensing

fusion (melting)  
heat of fusion  
heat storage  
heat transfer  
liquid-solid interfaces  
∞ materials  
melting  
organic materials  
phase transformations  
solar energy conversion  
solar heating  
sublimation  
Trombe walls  
waxes  
working fluids

### phase coherence

RT ∞ coherence  
coherence coefficient  
coherent light  
four-wave mixing  
wave fronts

### phase conjugation

DEF Technique for the removal of phase distortions during propagation of laser beams through the atmosphere.

GS conjugation  
. **phase conjugation**  
. . four-wave mixing

### phase contrast

GS contrast  
. **phase contrast**  
RT diffraction patterns  
electron microscopy  
microscopy  
optical measurement  
optical paths  
scanning electron microscopy  
transmission electron microscopy

### phase control

RT circuit protection  
∞ control  
phase locked systems  
transformers

### phase demodulators

GS demodulators  
. **phase demodulators**  
RT Bragg cells  
modems

### phase detectors

DEF Devices that continuously compare the phase of two signals and provide an output proportional to their difference in phase.

GS circuits  
. **phase detectors**  
. . synchrosopes  
RT ∞ detectors  
phase locked systems  
signal detection  
synchronism

### phase deviation

DEF The peak difference between the instantaneous phase of the modulated wave and the carrier frequency.

RT amplitudes  
modulated continuous radiation  
signal analysis

### phase diagrams

UF *constitutional diagrams*  
*equilibrium diagrams*  
*eutectic diagrams*  
GS diagrams  
. **phase diagrams**  
RT alloys  
binary systems (materials)  
cluster variation method  
critical temperature  
eutectics  
heat of fusion  
heat treatment  
intermetallics  
liquid phases  
liquids

liquidus  
melting points  
phase separation (materials)  
phase stability (materials)  
solid phases  
solid solutions  
solid suspensions  
solubility  
stoichiometry  
transition points  
transition temperature  
vapor phases

### phase error

GS errors  
. **phase error**  
RT anisoplanatism  
circuit protection  
error signals

### phase lock demodulators

GS demodulators  
. **phase lock demodulators**  
RT correlation detection  
parametrons

### phase locked systems

RT feedback frequency modulation  
optical coupling  
phase control  
phase detectors  
synchronized oscillators  
∞ systems  
tracking filters

### phase matching

DEF A way of maximizing the coupling between two systems used in second harmonic generation which happens mostly in crystals.

RT crystal optics  
crystals  
frequency multipliers  
harmonic generations  
laser outputs  
lasers

### phase modulation

DEF Angle modulation in which the angle of a sine wave carrier is caused to depart from the carrier angle by an amount proportional to the instantaneous value of the modulation wave. Combinations of phase and frequency modulation are commonly referred to as frequency modulation.

GS coding  
. signal encoding  
. . **phase modulation**  
. . . FM/PM (modulation)  
. . . phase shift keying  
. . . . binary phase shift keying  
. . . . quadrature phase shift keying  
modulation  
. **phase modulation**  
. . FM/PM (modulation)  
. . phase shift keying  
. . . binary phase shift keying  
. . . quadrature phase shift keying  
RT amplitude modulation  
Bragg cells  
deformable mirrors  
demodulation  
demodulators  
frequency modulation  
modems  
modulators  
parametric frequency converters  
pulse modulation  
push-pull amplifiers  
trellis coding

### phase response

USE **frequency response**  
**phase shift**

### phase rule

GS rules  
. **phase rule**  
RT chemical equilibrium  
degrees of freedom

∞ Gibbs equations

### phase separation (materials)

(added December 1988)

RT binary systems (materials)  
 liquid phases  
 miscibility gap  
 phase diagrams  
 phase stability (materials)  
 phase transformations  
 ∞ separation  
 solid phases  
 solubility

### phase shift

DEF The phase difference of two periodically recurring phenomena of the same frequency, expressed in angular measure. The angle between the lines connecting a celestial body and the sun and a celestial body and the Earth. Used for phase angle and phase response.

UF *phase angle*  
*phase response*

GS **phase shift**

. Sagnac effect  
 RT angles (geometry)  
 equalizers (circuits)  
 microwave switching

∞ phases  
 ∞ shift

### phase shift circuits

GS circuits  
 . **phase shift circuits**  
 . . . circulators (phase shift circuits)  
 RT delay circuits  
 duplex operation  
 gyrators

### phase shift keying

DEF The form of phase modulation in which the modulating function shifts the instantaneous phase of the modulated wave among predetermined discrete values.

GS coding  
 . signal encoding  
 . . phase modulation  
 . . . **phase shift keying**  
 . . . . binary phase shift keying  
 . . . . quadrature phase shift keying  
 keying  
 . **phase shift keying**  
 . . binary phase shift keying  
 . . quadrature phase shift keying  
 modulation  
 . phase modulation  
 . . **phase shift keying**  
 . . . binary phase shift keying  
 . . . quadrature phase shift keying  
 RT cochannel interference  
 information theory  
 quadrature amplitude modulation  
 Rayleigh fading  
 trellis coding

### phase stability (materials)

(added July 1991)

GS stability  
 . **phase stability (materials)**  
 RT crystallization  
 phase diagrams  
 phase separation (materials)  
 phase transformations  
 ∞ phases  
 stabilization

### phase switching interferometers

GS measuring instruments  
 . interferometers  
 . . **phase switching interferometers**  
 RT radio astronomy  
 radio telescopes

### phase transformations

GS **phase transformations**  
 . freezing  
 . . vibrational freezing  
 . . zone melting  
 . liquefaction

. . coal liquefaction  
 . martensitic transformation  
 . melting  
 . . arc melting  
 . . fusion (melting)  
 . . levitation melting  
 . . vacuum melting  
 . . zone melting  
 . vaporizing  
 . . boiling  
 . . . film boiling  
 . . . nucleate boiling  
 . . . . Leidenfrost phenomenon  
 . . evaporation  
 . . . evapotranspiration  
 . . . propellant evaporation  
 . . . transpiration  
 . . flashing (vaporizing)  
 . . prevaporization  
 . . sublimation

RT cluster variation method  
 cold hardening  
 condensing  
 critical temperature  
 crystallization  
 directional solidification (crystals)  
 electron-hole drops  
 ferroelasticity  
 heat of fusion  
 Ising model  
 Laves phases  
 martensite  
 melt spinning  
 metamorphism (geology)  
 mushy zones  
 neel temperature  
 order-disorder transformations  
 Ostwald ripening  
 phase change materials  
 phase separation (materials)  
 phase stability (materials)  
 ∞ phases  
 shape memory alloys  
 solidification  
 solids  
 syntectic alloys  
 ∞ transformations  
 ∞ transition  
 transition pressure  
 transition temperature

### phase velocity

DEF Of a traveling plane wave at a single frequency, the velocity of an equiphase surface along the wave normal.

GS rates (per time)  
 . **phase velocity**  
 velocity

RT **phase velocity**  
 electromagnetic radiation  
 group velocity  
 Landau damping  
 propagation velocity  
 quantum mechanics  
 traveling waves  
 wave fronts  
 wave propagation

### phased arrays

GS arrays  
 . **phased arrays**  
 RT antenna arrays  
 laser arrays  
 linear arrays  
 monopulse antennas  
 seismographs  
 steerable antennas

### ∞ phases

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT cycles  
 liquid phases  
 lunar phases  
 phase shift  
 phase stability (materials)  
 phase transformations  
 solid phases  
 terminator lines

vapor phases

### phase-space integral

GS analysis (mathematics)  
 . **phase-space integral**  
 RT classical mechanics  
 Euclidean geometry  
 hyperspaces  
 state vectors

*phenacetin*

USE **acetanilide**

### phenanthrene

GS organic compounds  
 . hydrocarbons  
 . . **phenanthrene**  
 RT anthracene  
 dyes  
 isomers

### phenobarbital

RT drugs  
 narcotics  
 sedatives

### phenol formaldehyde

RT formaldehyde  
 phenolic resins  
 resins

### phenolic epoxy resins

GS plastics  
 . synthetic resins  
 . . thermosetting resins  
 . . . epoxy resins  
 . . . . **phenolic epoxy resins**  
 . . . phenolic resins  
 . . . . **phenolic epoxy resins**  
 resins  
 . synthetic resins  
 . . thermosetting resins  
 . . . epoxy resins  
 . . . . **phenolic epoxy resins**  
 . . . phenolic resins  
 . . . . **phenolic epoxy resins**  
 RT adhesives  
 amines  
 crosslinking

### phenolic resins

GS plastics  
 . synthetic resins  
 . . thermosetting resins  
 . . . **phenolic resins**  
 . . . . micarta  
 . . . . phenolic epoxy resins  
 resins  
 . synthetic resins  
 . . thermosetting resins  
 . . . **phenolic resins**  
 . . . . micarta  
 . . . . phenolic epoxy resins  
 RT carbon-phenolic composites  
 phenol formaldehyde

### phenology

DEF A branch of science dealing with the relations between climate and periodic biological phenomena.

RT activity cycles (biology)  
 biometeorology  
 climatology  
 coastal ecology  
 ecology  
 migration  
 molting  
 phenomenonology  
 rhythm (biology)  
 zeitgebers

### phenols

GS hydroxyl compounds  
 . alcohols  
 . . **phenols**  
 . . . bisphenols  
 . . . cresols  
 . . . phloroglucinol  
 . . . thymol

## phenomenology

RT thiols

### phenomenology

RT case histories  
experimentation  
medical phenomena  
mesoscale phenomena  
phenology

### phenothiazines

GS organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . azines  
. . . . **phenothiazines**  
poisons  
. pesticides  
. . . insecticides  
. . . **phenothiazines**  
pyrazines  
. azines  
. . **phenothiazines**

### phenotype

(added August 2004)

DEF The outward appearance of the individual. It is the product of interactions between genes, and between the genotype and the environment.

RT cloning (biology)  
gene expression  
genes  
genetic engineering  
genetically modified plants

### phenylalanine

GS acids  
. amino acids  
. . alanine  
. . . **phenylalanine**  
. carboxylic acids  
. . alanine  
. . . **phenylalanine**  
organic compounds  
. amino acids  
. . alanine  
. . . **phenylalanine**  
. carboxylic acids  
. . alanine  
. . . **phenylalanine**

### phenyls

GS **phenyls**  
. polybrominated biphenyls  
. polychlorinated biphenyls  
. polyphenyls  
. . tetraphenyls  
. . triphenyls  
. terphenyls  
RT phosphene  
propargyl groups

### Philco 2000 computer

GS data processing equipment  
. computers  
. . digital computers  
. . . **Philco 2000 computer**

### Philippines

GS landforms  
. islands  
. . Pacific islands  
. . . **Philippines**  
nations  
. **Philippines**

### Philips ionization gages

GS measuring instruments  
. pressure gages  
. . vacuum gages  
. . . ionization gages  
. . . . **Philips ionization gages**  
vacuum apparatus  
. vacuum gages  
. . ionization gages  
. . . **Philips ionization gages**  
RT pressure measurement

### philosophy

GS philosophy

. . paradoxes  
RT knowledge  
literature  
 $\infty$  logic  
mathematical logic

### phloroglucinol

GS hydroxyl compounds  
. alcohols  
. . phenols  
. . . **phloroglucinol**  
RT chemical indicators  
resins

### phobias

GS **phobias**  
. fear  
. . fear of flying  
RT anxiety  
emotional factors

### Phobos

DEF A satellite of Mars orbiting at a mean distance of 9,400 kilometers.  
GS celestial bodies  
. natural satellites  
. . Mars satellites  
. . . **Phobos**  
RT Deimos  
Mars (planet)  
Nozomi Mars Orbiter  
Phobos spacecraft

### Phobos spacecraft

(added August 1998)

DEF Two Soviet spacecraft (Phobos 1 and 2, both launched in July 1988) designed to study the plasma environment in the Martian vicinity, the surface and atmosphere of Mars, and the surface composition of the Martian satellite Phobos. Other mission objectives included the study of the interplanetary environment and solar observations.

GS interplanetary spacecraft  
. Mars probes  
. . **Phobos spacecraft**  
Soviet spacecraft  
. **Phobos spacecraft**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . **Phobos spacecraft**  
RT Mars atmosphere  
Mars environment  
Phobos

### Phoebe

DEF A satellite of Saturn orbiting at a mean distance of 12,960,000 kilometers.  
GS celestial bodies  
. natural satellites  
. . Saturn satellites  
. . . **Phoebe**  
RT Saturn (planet)

### Phoebus nuclear reactor

GS nuclear reactors  
. **Phoebus nuclear reactor**  
RT KIWI reactors  
nuclear engine for rocket vehicles  
nuclear rocket engines

### Phoenix (AZ)

GS cities  
. **Phoenix (AZ)**  
RT Arizona

### Phoenix Mars Lander

(added December 2007)

DEF A robotic spacecraft launched under the Mars Scout Program to land in the planet's water-ice-rich northern polar region. Instruments aboard the lander were developed to search for environments suitable for microbial life on Mars and research the history of water there. The lander mission was headed by the Lunar and Planetary Laboratory at the University of Arizona and was the first scientist led mission to Mars.

GS interplanetary spacecraft  
. Mars probes

. . **Phoenix Mars Lander**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . **Phoenix Mars Lander**  
RT extraterrestrial life  
extraterrestrial water  
Mars missions  
Mars surface

### Phoenix quadrangle (AZ)

GS landforms  
. **Phoenix quadrangle (AZ)**  
RT Arizona  
geodetic surveys  
mapping

### Phoenix sounding rocket

GS rocket vehicles  
. multistage rocket vehicles  
. . **Phoenix sounding rocket**  
. sounding rockets  
. . **Phoenix sounding rocket**  
RT solid propellant rocket engines

### phonemes

GS speech  
. **phonemes**  
RT languages  
linguistics  
phonemics  
phonetics  
psycholinguistics  
speech recognition  
words (language)

### phonemics

GS linguistics  
. **phonemics**  
RT intelligibility  
languages  
phonemes  
phonetics  
psycholinguistics  
speech  
speech defects  
speech recognition  
words (language)

### phonetics

GS linguistics  
. **phonetics**  
speech  
. **phonetics**  
RT acoustics  
intelligibility  
languages  
phonemes  
phonemics  
speech defects  
speech recognition  
verbal communication  
words (language)

### phonoarteriography

RT arteries  
blood circulation  
phonocardiography

### phonocardiograms

USE **phonocardiography**

### phonocardiography

UF *phonocardiograms*  
*vibrocardiography*  
GS bioengineering  
. biometrics  
. . cardiology  
. . . **phonocardiography**  
. . . . echocardiography  
RT ballistocardiography  
electrocardiography  
heart  
heart diseases  
phonoarteriography  
vectorcardiography

### phonon beams

GS beams (radiation)  
. **phonon beams**

- elastic waves
- . phonons
- . . **phonon beams**
- electromagnetic radiation
- . thermal radiation
- . . **phonon beams**
- elementary excitations
- . phonons
- . . **phonon beams**
- RT corpuscular radiation
- particle beams
- photon beams
- Umklapp process
  
- phonons**
- GS elastic waves
- . **phonons**
- . . phonon beams
- elementary excitations
- . **phonons**
- . . phonon beams
- RT crystal structure
- lattice vibrations
- plasmons
- polarons
- sound waves
- Umklapp process
  
- phoria**
- GS diseases
- . eye diseases
- . . **phoria**
  
- phosgene**
- GS gases
- . **phosgene**
- halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **phosgene**
- . halides
- . . chlorides
- . . . **phosgene**
- poisons
- . **phosgene**
- RT ∞ chemical compounds
  
- phosphatases**
- (added August 2004)
- DEF A group of hydrolases which catalyze the hydrolysis of monophosphoric esters and the transfer of phosphate groups.
- GS biopolymers
- . proteins
- . . enzymes
- . . . **phosphatases**
- organic compounds
- . proteins
- . . enzymes
- . . . **phosphatases**
- RT catalytic activity
- enzymology
- esters
- hydrolysis
- phosphates
  
- phosphates**
- GS phosphorus compounds
- . **phosphates**
- . . adenines
- . . adenosine triphosphate
- . . ammonium phosphates
- . . calcium phosphates
- . . cyclic AMP
- . . diphosphates
- . . . adenosine diphosphate
- . . . adenosine monophosphate
- . . . indium phosphates
- . . . monazite sands
- . . . phosphene
- . . . polynucleotides
- . . . potassium phosphates
- . . . pyridine nucleotides
- . . . uridylic acid
- RT creep
- phosphatases
- phosphoric acid
  
- Skydrol (trademark)
  
- phosphazene**
- DEF A ring or chain polymer that contains alternating phosphorus and nitrogen atoms, with two substituents on each phosphorus atom.
- GS organic compounds
- . organic phosphorus compounds
- . . **phosphazene**
- phosphorus compounds
- . organic phosphorus compounds
- . . **phosphazene**
- RT nitrogen compounds
- phosphines
- phosphonitriles
- polymer chemistry
  
- phosphene**
- GS organic compounds
- . organic phosphorus compounds
- . . **phosphene**
- phosphorus compounds
- . organic phosphorus compounds
- . . **phosphene**
- . phosphates
- . . **phosphene**
- RT luminosity
- phenyls
- retina
- vision
  
- phosphides**
- GS phosphorus compounds
- . **phosphides**
- . . boron phosphides
- . . gallium phosphides
- . . indium phosphides
- . . manganese phosphides
- . . schreibersite
  
- phosphines**
- GS hydrogen compounds
- . hydrides
- . . **phosphines**
- phosphorus compounds
- . **phosphines**
- RT phosphazene
  
- phosphonitriles**
- GS nitrogen compounds
- . nitriles
- . . **phosphonitriles**
- organic compounds
- . nitriles
- . . **phosphonitriles**
- . organic phosphorus compounds
- . . **phosphonitriles**
- phosphorus compounds
- . organic phosphorus compounds
- . . **phosphonitriles**
- RT phosphazene
  
- phosphonium compounds**
- GS phosphorus compounds
- . **phosphonium compounds**
- RT ∞ chemical compounds
  
- phosphorescence**
- DEF Emission of light which continues after the exciting mechanism has ceased.
- GS electromagnetic properties
- . optical properties
- . . **phosphorescence**
- emission
- . light emission
- . . luminescence
- . . . fluorescence
- . . . . **phosphorescence**
- RT afterglows
- bioluminescence
- chemiluminescence
- phosphors
- plasma radiation
- scintillation
- trapping
  
- phosphoric acid**
- GS acids
- . **phosphoric acid**
- phosphorus compounds
  
- . **phosphoric acid**
- RT phosphates
  
- phosphoric acid fuel cells**
- DEF Long life fuel cells for the low to medium wattage range which use phosphoric acid as an electrolyte.
- GS electric generators
- . direct power generators
- . . fuel cells
- . . . **phosphoric acid fuel cells**
- electrochemical cells
- . fuel cells
- . . **phosphoric acid fuel cells**
- RT biochemical fuel cells
- electrolytic cells
- energy technology
- hydrogen oxygen fuel cells
- regenerative fuel cells
- total energy systems
  
- phosphors**
- DEF Phosphorescent substances such as zinc sulfide, which emit light when excited by radiation, as on the scope of a cathode ray tube.
- GS **phosphors**
- . radiophosphors
- RT fluorescence
- image intensifiers
- laser induced fluorescence
- mercury lamps
- phosphorescence
- photographic film
  
- phosphorus**
- GS chemical elements
- . **phosphorus**
- . . phosphorus isotopes
- . . . phosphorus 32
  
- phosphorus 32**
- GS chemical elements
- . nuclides
- . . isotopes
- . . . phosphorus isotopes
- . . . . **phosphorus 32**
- . . . . radioactive isotopes
- . . . . **phosphorus 32**
- . phosphorus
- . . phosphorus isotopes
- . . . **phosphorus 32**
  
- phosphorus compounds**
- GS **phosphorus compounds**
- . diethyl hydrogen phosphite (DEHP)
- . organic phosphorus compounds
- . . phosphazene
- . . phosphene
- . . phosphonitriles
- . . uridylic acid
- . phosphates
- . . adenines
- . . adenosine triphosphate
- . . ammonium phosphates
- . . calcium phosphates
- . . cyclic AMP
- . . diphosphates
- . . . adenosine diphosphate
- . . . adenosine monophosphate
- . . . indium phosphates
- . . . monazite sands
- . . . phosphene
- . . . polynucleotides
- . . . potassium phosphates
- . . . pyridine nucleotides
- . . . uridylic acid
- . phosphides
- . . boron phosphides
- . . gallium phosphides
- . . indium phosphides
- . . manganese phosphides
- . . schreibersite
- . phosphines
- . . phosphonium compounds
- . . phosphoric acid
- . . phosphorus oxides
- . . phosphorus polymers
- RT ∞ chemical compounds

## phosphorus isotopes

∞ Group 5A compounds

### phosphorus isotopes

- GS chemical elements
  - . nuclides
  - . . isotopes
  - . . . **phosphorus isotopes**
  - . . . . phosphorus 32
  - . phosphorus
  - . . **phosphorus isotopes**
  - . . . phosphorus 32

### phosphorus metabolism

- GS metabolism
  - . **phosphorus metabolism**

### phosphorus oxides

- GS chalcogenides
  - . oxides
  - . . **phosphorus oxides**
- phosphorus compounds
  - . **phosphorus oxides**

### phosphorus polymers

- GS phosphorus compounds
  - . **phosphorus polymers**
- RT ∞ polymers

### phosphorylation

- GS chemical reactions
  - . **phosphorylation**

### photics

- RT light (visible radiation)
- ∞ optics

### photo reconnaissance spacecraft

- GS military spacecraft
  - . reconnaissance spacecraft
  - . . **photo reconnaissance spacecraft**
- RT ∞ spacecraft

### photoabsorption

- GS energy absorption
  - . radiation absorption
  - . . electromagnetic absorption
  - . . . **photoabsorption**
- RT ∞ absorption
  - . photoexcitation

### photoacoustic microscopy

- GS microscopy
  - . **photoacoustic microscopy**
- RT acoustic microscopes
  - . acousto-optics
  - . ceramics
  - . nondestructive tests
  - . photoacoustic spectroscopy

### photoacoustic spectroscopy

DEF An optical technique for investigating solid and semisolid materials, in which the sample is placed in a closed chamber filled with a gas and illuminated with monochromatic radiation of any desired wavelength, and with intensity modulated at some acoustic frequency. Absorption of radiation results in a periodic heat flow from the sample, which generates sound detectable with a sensitive microphone.

- GS spectroscopy
  - . **photoacoustic spectroscopy**
- RT absorption spectra
  - . absorptivity
  - . acousto-optics
  - . laser applications
  - . laser spectroscopy
  - . photoacoustic microscopy
  - . photothermal deflection spectroscopy

### photocathodes

DEF Electrodes used for obtaining a photoelectric emission when irradiated. Used for photoelectric cathodes.

- UF *photoelectric cathodes*
- GS electrodes
  - . cathodes
  - . . tube cathodes
  - . . . **photocathodes**
- RT dark current
  - . electrode materials

image converters  
image intensifiers  
image orthicons  
light amplifiers  
microchannels  
orthicons  
photoelectric cells  
photoelectric emission  
photoelectric materials  
photomultiplier tubes

### photocells

USE **photoelectric cells**

### photochemical oxidants

DEF Any of the chemicals which enter into oxidation reactions in the presence of light or other radiant energy.

- GS oxidizers
  - . **photochemical oxidants**
- RT air pollution
  - . atmospheric chemistry
  - . nitrogen oxides
  - . ozone
  - . photooxidation

### photochemical reactions

DEF Chemical reactions which involve either the absorption or emission of radiation. Used for photochemistry and photoreduction.

- UF *photochemistry*
  - . *photoreduction*
- GS chemical reactions
  - . **photochemical reactions**
  - . . photochromism
  - . . photodecomposition
  - . . photolysis
  - . . photooxidation
  - . . photosynthesis
  - . . radiolysis
- RT association reactions
  - . atmospheric chemistry
  - . charge transfer
  - . cycloaddition
  - . oxetane polymers
  - . sodalite
  - . volatile organic compounds

### photochemistry

USE **photochemical reactions**

### photochromism

- GS chemical reactions
  - . photochemical reactions
  - . . **photochromism**
- RT color photography
  - . sodalite

### photoclinometry

USE **photogrammetry**

### photoconductive cells

DEF Photoelectric cells whose electrical resistance varies with the amount of illumination falling upon the sensitive area of the cell.

- GS photoelectric cells
  - . **photoconductive cells**
- RT ∞ cells
  - . photovoltaic cells

### photoconductivity

DEF The conductivity increase exhibited by some nonmetallic materials, resulting from the free carriers generated when photon energy is absorbed in electronic transitions. The rate at which free carriers are generated, the mobility of the carriers, and the length of time they persist in conducting states (their lifetime) are some of the factors that determine the amount of conductivity change. Used for photoresistivity.

- UF *photoresistivity*
- GS electrical properties
  - . electrical resistivity
  - . . **photoconductivity**
  - . electromagnetic properties
  - . optical properties
  - . . **photoconductivity**
  - . photoelectricity
  - . photoelectric effect
  - . . **photoconductivity**

transport properties

- . electrical resistivity
- . . **photoconductivity**

RT ∞ conductivity

- . mercury cadmium tellurides
- . photoconductors
- . square wells

### photoconductors

- UF *photoresistors*
- GS conductors
  - . **photoconductors**
  - . semiconductors (materials)
  - . **photoconductors**
- RT mercury cadmium tellurides
  - . photoconductivity
  - . photodiodes
  - . photoelectric cells
  - . photoelectric materials
  - . photometers
  - . phototransistors
  - . resistors
  - . tunnel junctions

### photocurrents

USE **electric current**  
**photoelectric emission**

### photodecomposition

- GS chemical reactions
  - . photochemical reactions
  - . . **photodecomposition**
- decomposition
  - . **photodecomposition**
  - . radiation chemistry
  - . **photodecomposition**
- RT electromagnetic absorption
  - . photodetachment
  - . photolysis

### photodetachment

- RT photodecomposition
  - . photoionization

### photodetectors

USE **photometers**

### photodiodes

DEF Diodes designed to produce photocurrent by absorbing light. Photodiodes are used for the conversion of optical power to electrical power.

- GS electronic equipment
  - . diodes
  - . . semiconductor diodes
  - . . . **photodiodes**
  - . solid state devices
  - . . semiconductor devices
  - . . . **photodiodes**
  - . optoelectronic devices
  - . **photodiodes**
- RT dark current
  - . focal plane devices
  - . ion implantation
  - . lasers
  - . mercury cadmium tellurides
  - . MSM (semiconductors)
  - . photoconductors
  - . photoelectric cells
  - . photoelectric materials
  - . phototransistors
  - . phototubes
  - . pushbroom sensor modes
  - . SIS (semiconductors)
  - . solar cells
  - . x ray detectors

### photodissociation

DEF The dissociation (splitting) of a molecule by the absorption of a photon. The resulting components may be ionized in the process (photoionization).

- GS decomposition
  - . **photodissociation**
  - . dissociation
  - . **photodissociation**
  - . radiation chemistry
  - . **photodissociation**
- RT electromagnetic absorption
  - . photoexcitation

photolysis

**photoelastic analysis**  
 UF *photoelastic stress measurement*  
 RT fringe multiplication  
 Moire effects  
 ∞ optics  
 photographic measurement  
 ∞ polarization  
 polarization (waves)  
 stress analysis  
 stress measurement  
 temperature inversions

**photoelastic materials**  
 RT ∞ materials  
 photoelasticity

*photoelastic stress measurement*  
 USE **photoelastic analysis**

**photoelasticity**  
 GS electromagnetic properties  
 . **photoelasticity**  
 . . photoviscoelasticity  
 mechanical properties  
 . elastic properties  
 . . **photoelasticity**  
 . . . photoviscoelasticity  
 RT birefringence  
 dichroism  
 photoelastic materials  
 polarized light  
 prisms  
 refraction  
 stress analysis

*photoelectric cathodes*  
 USE **photocathodes**

**photoelectric cells**  
 DEF Transducers which convert electromagnetic radiation in the infrared, visible, and ultraviolet regions into electrical quantities such as voltage, current, or resistance. Used for photocells.  
 UF *photocells*  
 GS **photoelectric cells**  
 . photoconductive cells  
 . photovoltaic cells  
 . . solar cells  
 . . . vertical junction solar cells  
 RT ∞ cells  
 dark current  
 direct power generators  
 ∞ electric cells  
 electrochemical cells  
 electrode materials  
 energy absorption films  
 photocathodes  
 photoconductors  
 photodiodes  
 photometers  
 photomultiplier tubes  
 phototransistors  
 phototubes  
 solar generators  
 transducers

**photoelectric effect**  
 DEF The emission of an electron from a surface as the surface absorbs a photon of electromagnetic radiation. Electrons so emitted are termed photoelectrons.  
 GS photoelectricity  
 . **photoelectric effect**  
 . . photoconductivity  
 . . photoelectric emission  
 . . photoionization  
 . . photovoltaic effect  
 RT ∞ effects  
 photoelectrons

**photoelectric emission**  
 DEF The emission of electrons from atoms or molecules. Used for photocurrents, photoemission, and photoemissivity.  
 UF *photocurrents*  
*photoemission*  
*photoemissivity*

GS emission  
 . particle emission  
 . . electron emission  
 . . . **photoelectric emission**  
 photoelectricity  
 . photoelectric effect  
 . . **photoelectric emission**  
 RT electrical properties  
 external surface currents  
 negative electron affinity  
 photocathodes  
 photoexcitation  
 photoionization  
 photopeak  
 photovoltages  
 photovoltaic effect  
 stimulated emission  
 work functions

**photoelectric generators**  
 GS electric generators  
 . direct power generators  
 . . **photoelectric generators**  
 . . . photovoltaic cells  
 . . . . solar cells  
 . . . . vertical junction solar cells  
 RT ∞ generators  
 photoelectrochemical devices  
 solar energy conversion  
 solar generators  
 thermoelectric generators

**photoelectric materials**  
 UF *photoemitters*  
 RT electrode materials  
 electron emission  
 ∞ materials  
 photocathodes  
 photoconductors  
 photodiodes  
 photoelectricity  
 photoelectrons  
 phototransistors  
 phototubes  
 photovoltaic cells

*photoelectric photometers*  
 USE **electrophotometers**

**photoelectricity**  
 UF *photoelectronics*  
*photosensors*  
 GS **photoelectricity**  
 . photoelectric effect  
 . . photoconductivity  
 . . photoelectric emission  
 . . photoionization  
 . . photovoltaic effect  
 RT Compton effect  
 electrical properties  
 electricity  
 optical properties  
 photoelectric materials  
 photoelectrons  
 photovoltages

**photoelectrochemical devices**  
 DEF Electrochemical devices powered by light or other incident radiation to produce electricity and/or chemical fuels (e.g., hydrogen).  
 RT ∞ devices  
 electrochemical cells  
 electrode materials  
 energy technology  
 photoelectric generators  
 photoelectrochemistry  
 photon beams  
 solar energy conversion

**photoelectrochemistry**  
 DEF The study of the interaction between impinging light energy and the electropotential of the chemical changes in the electrode, electrolytic solution, or a photosensitive membrane.  
 GS electrochemistry  
 . **photoelectrochemistry**  
 RT ∞ chemistry

photoelectrochemical devices

*photoelectromagnetic detectors*  
 USE **photoelectromagnetic effects**  
**radiation measuring instruments**

**photoelectromagnetic effects**  
 UF *photoelectromagnetic detectors*  
 RT ∞ effects  
 excitons  
 intermetallics

**photoelectron spectroscopy**  
 GS spectroscopy  
 . **photoelectron spectroscopy**  
 RT electron emission  
 spectroscopic analysis

*photoelectronics*  
 USE **electronics**  
**photoelectricity**

**photoelectrons**  
 DEF Electrons which have been ejected from their parent atoms by interaction between those atoms and high energy photons.  
 GS particles  
 . charged particles  
 . . energetic particles  
 . . . electrons  
 . . . . **photoelectrons**  
 . . . . corpuscular radiation  
 . . . . energetic particles  
 . . . . electrons  
 . . . . . **photoelectrons**  
 . . . . . elementary particles  
 . . . . . fermions  
 . . . . . leptons  
 . . . . . electrons  
 . . . . . **photoelectrons**  
 . . . . . nuclear particles  
 . . **photoelectrons**  
 RT electron emission  
 photoelectric effect  
 photoelectric materials  
 photoelectricity  
 photoionization  
 photomagnetic effects  
 photoneutrons  
 photonuclear reactions  
 photovoltaic effect

*photoemission*  
 USE **photoelectric emission**

*photoemissivity*  
 USE **emissivity**  
**photoelectric emission**

*photoemitters*  
 USE **photoelectric materials**

**photoengraving**  
 RT micromachining  
 photomechanical effect  
 printing

**photoexcitation**  
*(added December 1992)*  
 GS excitation  
 . **photoexcitation**  
 potential energy  
 . electric potential  
 . . quantum wells  
 . . . **photoexcitation**  
 RT fluorescence  
 molecular excitation  
 photoabsorption  
 photodissociation  
 photoelectric emission  
 photoionization  
 photoluminescence

**photogeology**  
 GS geology  
 . **photogeology**  
 RT aerial photography  
 Earth Resources Survey aircraft  
 geological surveys  
 geomorphology  
 ice mapping



## photogoniometers

natural gas exploration  
photogrammetry  
photomapping  
reconnaissance  
thematic mapping

### photogoniometers

GS measuring instruments  
. goniometers  
. . . **photogoniometers**  
. optical measuring instruments  
. . . **photogoniometers**  
optical equipment  
. optical measuring instruments  
. . . **photogoniometers**  
RT angles (geometry)  
diffractometers  
etalons  
interferometers  
monochromators  
spectrometers

### photogrammetry

DEF The art or science of obtaining reliable measurements by means of photography. Used for photoclinometry.

UF *photoclinometry*  
GS photographic measurement  
. **photogrammetry**  
RT aerial photography  
digital cameras  
mapping  
photogeology  
photoreconnaissance  
projectors  
relief maps  
stereophotography  
surveys  
terrain analysis

*photograph interpretation*

USE **photointerpretation**

### photographic developers

UF *developers (photography)*  
RT ∞ development  
photographs  
photography

### photographic emulsions

DEF The light-sensitive coatings on photographic film consisting usually of silver halide.

GS mixtures  
. dispersions  
. . . emulsions  
. . . . **photographic emulsions**  
. . . . nuclear emulsions  
. solutions  
. . . **photographic emulsions**  
. . . nuclear emulsions  
RT photography  
photosensitivity

### photographic equipment

GS **photographic equipment**  
. cameras  
. . Baker-Nunn camera  
. . ballistic cameras  
. . CCD cameras  
. . Delft camera  
. . diffraction limited cameras  
. . faint object camera  
. . high speed cameras  
. . . framing cameras  
. . digital cameras  
. . I2S cameras  
. . Lallemand cameras  
. . multispectral band cameras  
. . panoramic cameras  
. . pinhole cameras  
. . Schmidt cameras  
. . streak cameras  
. . television cameras  
. photographic processing equipment  
. photographic rectifiers  
RT ∞ equipment  
lenses  
optical equipment  
optical filters  
photography

photometers  
projectors

### photographic film

GS **photographic film**  
. microfilms  
RT ∞ films  
magazines (supply chambers)  
optical data storage materials  
optical filters  
phosphors  
photographs  
photography  
polymeric films  
Sabatier reaction

### photographic measurement

GS **photographic measurement**  
. photogrammetry  
RT dosimeters  
∞ measurement  
optical correction procedure  
optical measurement  
particle image velocimetry  
photoelastic analysis  
photography  
photointerpretation  
photometry  
photoreconnaissance  
spectrometers

### photographic plates

RT glass  
photographic processing  
photographs  
photography  
∞ plates

### photographic processing

RT darkrooms  
photographic plates  
photographs  
photography  
printing  
∞ processing

### photographic processing equipment

GS photographic equipment  
. **photographic processing equipment**  
RT darkrooms  
photography  
reproduction (copying)

### photographic recording

GS recording  
. **photographic recording**  
RT data recording  
high speed photography  
hologrammetry  
intermittency hypothesis  
particle image velocimetry  
photographs  
photography  
recording instruments

### photographic rectifiers

GS optical equipment  
. **photographic rectifiers**  
photographic equipment  
. **photographic rectifiers**  
RT ∞ condensers  
photography

### photographic tracking

GS tracking (position)  
. **photographic tracking**  
RT cinetheodolites  
optical tracking  
photography  
satellite tracking  
space detection and tracking system

### photographs

GS **photographs**  
. cloud photographs  
. lunar photographs  
. Mars photographs  
. microphotographs  
. motion pictures

. photomicrographs  
RT display devices  
images  
mosaics  
optical correction procedure  
photographic developers  
photographic film  
photographic plates  
photographic processing  
photographic recording  
photography  
pixels  
representations  
spatial filtering  
video tapes  
visual aids  
xerography

### photography

DEF A process for recording visual images by exposing a light-sensitive substance to radiation such as visible light, infrared radiation, or x-rays.

GS imagery  
. **photography**  
. . aerial photography  
. . all sky photography  
. . astronomical photography  
. . autoradiography  
. . black and white photography  
. . chronophotography  
. . cinematography  
. . cloud photography  
. . color photography  
. . electron photography  
. . electro-optical photography  
. . fractography  
. . frame photography  
. . high speed photography  
. . holography  
. . . acoustical holography  
. . . microwave holography  
. . . speckle holography  
. . . white light holography  
. . infrared imagery  
. . lunar photography  
. . metric photography  
. . microwave photography  
. . multispectral photography  
. . . infrared photography  
. . . . color infrared photography  
. . . radar photography  
. . orthophotography  
. . photomicrography  
. . rocket-borne photography  
. . shadowgraph photography  
. . Schlieren photography  
. . spaceborne photography  
. . . satellite-borne photography  
. . spectrophotography  
. . stereoscopy  
. . stereophotography  
. . streak photography  
. . ultraviolet photography  
. . ultraviolet photometry  
. . underwater photography  
. . urography

RT brightness distribution  
brightness temperature  
cameras  
CCD cameras  
cloud photographs  
darkrooms  
Earth observations (from space)  
Earth resources  
evaporography  
exposure  
graphic arts  
HS-801 aircraft  
ice mapping  
imaging techniques  
lunar photographs  
mapping  
Mars photographs  
microphotographs  
multispectral band cameras  
multispectral band scanners  
panoramic cameras  
photographic developers

photographic emulsions  
 photographic equipment  
 photographic film  
 photographic measurement  
 photographic plates  
 photographic processing  
 photographic processing equipment  
 photographic recording  
 photographic rectifiers  
 photographic tracking  
 photographs  
 photointerpretation  
 photolithography  
 photomapping  
 photomaps  
 photomasks  
 photomechanical effect  
 photoreconnaissance  
 pinhole cameras  
 pixels  
 projectors  
 radiography  
 rapid ballistics identification  
 reproduction (copying)  
 timber inventory  
 video tapes  
 wave front reconstruction  
 xerography

**photointerpretation**

UF *photograph interpretation*  
 RT aerial photography  
 ∞ analyzing  
 change detection  
 ground truth  
 ∞ interpretation  
 photographic measurement  
 photography  
 photomapping  
 photoreconnaissance  
 sea truth  
 spatial filtering

**photoionization**

DEF The ionization of an atom or molecule by the collision of a high energy photon with the particle.  
 GS emission  
 . **photoionization**  
 ionization  
 . **photoionization**  
 photoelectricity  
 . photoelectric effect  
 . . **photoionization**  
 RT atmospheric ionization  
 auroral ionization  
 auroral irradiation  
 electron emission  
 gas ionization  
 laser induced fluorescence  
 photodetachment  
 photoelectric emission  
 photoelectrons  
 photoexcitation

**photolithography**

DEF The process of making a printing plate by exposing a design photographically on a sensitized emulsion and removing unwanted portions chemically.  
 GS printing  
 . lithography  
 . . **photolithography**  
 RT lab-on-a-chip devices  
 microelectronics  
 micromodules  
 photography  
 photoresists

**photoluminescence**

DEF Luminescence produced by the absorption of radiant flux, distinguished from ordinary reflection by a time delay and usually, an upward shift in a wavelength.  
 GS emission  
 . light emission  
 . . luminescence  
 . . . **photoluminescence**  
 . . . . triboluminescence  
 . . . . x ray fluorescence

RT blue shift  
 fluorescence  
 laser induced fluorescence  
 photoexcitation  
 photoluminescent bands  
 photorefractivity  
 porous silicon

**photoluminescent bands**

GS spectra  
 . spectral bands  
 . . **photoluminescent bands**  
 RT absorption spectra  
 ∞ bands  
 emission spectra  
 photoluminescence  
 triboluminescence

**photolysis**

GS chemical reactions  
 . photochemical reactions  
 . . **photolysis**  
 decomposition  
 . **photolysis**  
 radiation chemistry  
 . **photolysis**  
 RT cracking (chemical engineering)  
 electrolysis  
 photodecomposition  
 photodissociation  
 radiolysis

**photomagnetic effects**

RT deuterons  
 ∞ effects  
 gamma rays  
 photoelectrons  
 spin decoupling

**photomapping**

GS mapping  
 . **photomapping**  
 RT aerial photography  
 Coastal Zone Color Scanner  
 color photography  
 DMSP satellites  
 Earth resources  
 geodesy  
 geology  
 gnomonic projection  
 hologrammetry  
 ice mapping  
 maps  
 ocean color scanner  
 photogeology  
 photography  
 photointerpretation  
 rocket-borne photography  
 satellite-borne photography  
 soil mapping  
 spaceborne photography  
 thematic mapping  
 thermal mapping  
 topography

**photomaps**

GS maps  
 . **photomaps**  
 RT aerial photography  
 photography  
 relief maps  
 satellite-borne photography  
 spaceborne photography  
 thematic mapping

**photomasks**

DEF In the production of integrated circuit devices, repeated arrays of microphotographs of the circuit patterns on glass substrates used to form successive patterns on single wafers often of submicrometer sizes.  
 RT arrays  
 circuit diagrams  
 integrated circuits  
 masking  
 microelectronics  
 micromachining  
 microphotographs  
 ∞ patterns  
 photography

photoresists  
 printed circuits  
 solid state devices  
 substrates  
 wafers

**photomechanical effect**

RT ∞ effects  
 lithography  
 micromachining  
 photoengraving  
 photography  
 printing

**photometers**

DEF Instruments for measuring the intensity of light or the relative intensity of a pair of lights. Used for microphotometers and photodetectors.  
 UF *microphotometers*  
*photodetectors*  
 GS measuring instruments  
 . optical measuring instruments  
 . . **photometers**  
 . . . electrophotometers  
 . . . . ultraviolet spectrometers  
 . . . . high dispersion spectrographs  
 . . . . Total Ozone Mapping Spectrometer  
 . . . quantum well infrared photodetectors  
 . . . ultraviolet spectrophotometers  
 . . . radiation measuring instruments  
 . . **photometers**  
 . . . electrophotometers  
 . . . ultraviolet spectrometers  
 . . . . high dispersion spectrographs  
 . . . . Total Ozone Mapping Spectrometer  
 . . . quantum well infrared photodetectors  
 . . . ultraviolet spectrophotometers  
 optical equipment  
 . optical measuring instruments  
 . . **photometers**  
 . . . electrophotometers  
 . . . ultraviolet spectrometers  
 . . . . high dispersion spectrographs  
 . . . . Total Ozone Mapping Spectrometer  
 . . . quantum well infrared photodetectors  
 . . . ultraviolet spectrophotometers  
 RT bolometers  
 densitometers  
 electrophotometry  
 ellipsometers  
 horizon scanners  
 infrared spectrophotometers  
 microdensitometers  
 nephelometers  
 optical measurement  
 photoconductors  
 photoelectric cells  
 photographic equipment  
 photometry  
 phototransistors  
 polarimeters  
 pyranometers  
 radiometers  
 reflectometers  
 spectrometers  
 spectrophotometers  
 telephotometry  
 transmissometers  
 ultraviolet detectors  
 x ray detectors

**photometry**

DEF The study of the measurement of the intensity of light.  
 GS optical measurement  
 . **photometry**  
 . . astronomical photometry  
 . . . stellar spectrophotometry  
 . . . electrophotometry  
 . . . infrared photometry  
 . . . spectrophotometry  
 . . . stellar spectrophotometry  
 . . telephotometry  
 . . ultraviolet photometry

## photomicrographs

. . visual photometry  
RT chemical analysis  
colorimetry  
illuminating  
∞ illumination  
light (visible radiation)  
luminance  
photographic measurement  
photometers  
polarimetry  
reflectance  
spectroscopy  
transmittance

**photomicrographs**  
GS photographs  
. **photomicrographs**  
RT photomicrography

**photomicrography**  
UF *micrography*  
GS imagery  
. photography  
. . **photomicrography**  
RT black and white photography  
electron microscopes  
metallography  
microscopes  
microscopy  
microstructure  
photomicrographs

**photomultiplier tubes**  
DEF Phototubes with one or more dynodes between its photocathode and output electrode. Used for electron multipliers and multiplier phototubes.

UF *electron multipliers*  
*multiplier phototubes*  
GS amplifiers  
. current amplifiers  
. . **photomultiplier tubes**  
. . . frequency modulation  
photomultipliers  
electron tubes  
. cold cathode tubes  
. . phototubes  
. . . **photomultiplier tubes**  
. . . . frequency modulation  
photomultipliers

RT cathodes  
channel multipliers  
dynodes  
electrodes  
microchannel plates  
microwave tubes  
multipactor discharges  
multipliers  
photocathodes  
photoelectric cells  
scintillating fibers  
scintillation counters  
secondary emission

**photon absorptiometry**  
GS density measurement  
. **photon absorptiometry**  
RT absorption spectra  
densitometers  
electromagnetic absorption  
energy absorption  
gamma ray absorptiometry  
gamma ray absorption  
multiphoton absorption  
radiation absorption

**photon beams**  
GS beams (radiation)  
. **photon beams**  
electromagnetic radiation  
. **photon beams**  
RT beam waveguides  
gamma ray beams  
incident radiation  
laser outputs  
light beams  
optical paths  
optical scanners  
phonon beams  
photoelectrochemical devices

photonic propulsion  
photons  
reflected waves  
refracted waves  
thermal blooming

**photon density**  
GS rates (per time)  
. flux density  
. . **photon density**  
RT squeezed states (quantum theory)

**photon-electron interaction**  
RT elastic scattering  
electron scattering  
elementary particle interactions  
∞ interactions  
Umklapp process

**photoneutrons**  
GS nuclear radiation  
. **photoneutrons**  
particles  
. elementary particles  
. . fermions  
. . . neutrons  
. . . . **photoneutrons**  
. neutral particles  
. . neutrons  
. . . **photoneutrons**  
RT baryons  
nuclear particles  
nuclear reactions  
photoelectrons  
photonuclear reactions  
vector dominance model

**photonic propulsion**  
GS propulsion  
. low thrust propulsion  
. . **photonic propulsion**  
. . . laser propulsion  
. spacecraft propulsion  
. . **photonic propulsion**  
. . . laser propulsion  
RT electromagnetic propulsion  
photon beams

*photonic switching*  
USE **optical switching**

**photonics**  
RT electro-optics  
fiber optics  
free-space optical interconnects  
lasers  
light emitting diodes  
optical data processing  
optical interconnects  
optical switching  
optical waveguides  
optoelectronic devices  
photons

**photons**  
DEF According to the quantum theory of radiation, the elementary quantities of radiant energy. They are regarded as discrete quantities having a momentum equal to  $h\nu/c$ , where  $h$  is the Planck constant,  $\nu$  is the frequency of the radiation, and  $c$  is the speed of light in a vacuum. Photons are never at rest, have no electric charges and no magnetic moments, but they have spin moments. The energy of a photon (the unit quantum of energy) is equal to  $h\nu$ .

GS particles  
. elementary particles  
. . bosons  
. . . **photons**  
. nuclear particles  
. . bosons  
. . . **photons**  
RT annihilation reactions  
cosmic rays  
electromagnetic radiation  
gamma rays  
light (visible radiation)  
nuclear radiation  
optical properties  
photon beams

photonics  
photonuclear reactions  
photoproduction  
Planck's constant  
quantum theory  
∞ radiation  
rotations

**photonuclear reactions**  
GS nuclear reactions  
. **photonuclear reactions**  
RT electromagnetic interactions  
light (visible radiation)  
particle interactions  
photoelectrons  
photoneutrons  
photons  
photoproduction

**photooxidation**  
GS chemical reactions  
. oxidation  
. . **photooxidation**  
. . photochemical reactions  
. . **photooxidation**  
RT association reactions  
photochemical oxidants

**photopeak**  
RT amplitude distribution analysis  
photoelectric emission  
pulse amplitude  
scintillation counters

**photoperiod**  
(added August 2004)  
DEF The time of daily exposure that an organism receives from daylight or artificial light. It is believed the photoperiodic responses may affect the control of energy balance and thermoregulation.

GS cycles  
. **photoperiod**  
exposure  
. **photoperiod**  
RT activity cycles (biology)  
circadian rhythms  
diurnal variations  
light (visible radiation)  
melatonin

**photophilic plants**  
GS plants (botany)  
. **photophilic plants**  
RT light (visible radiation)  
photosensitivity

**photophoresis**  
DEF Production of unidirectional motion in a collection of very fine particles, suspended in a gas or falling in a vacuum, by a powerful beam of light.

RT aerosols  
light (visible radiation)  
particle interactions  
particle motion  
radiation pressure

**photoplasticity**  
GS mechanical properties  
. plastic properties  
. . **photoplasticity**

**photopolymers**  
(added July 1995)  
DEF Polymers created by photochemical processes.  
RT diffractive optics  
display devices  
holography  
photoresists  
∞ polymers

**photoproduction**  
GS electromagnetic interactions  
. **photoproduction**  
particle production  
. **photoproduction**  
RT electromagnetic absorption  
pair production

photons  
 photonuclear reactions  
 radioactive decay  
 vector dominance model

**photoreceptors**

GS anatomy  
 . sense organs  
 . . **photoreceptors**  
 receptors (physiology)  
 . **photoreceptors**  
 RT eye (anatomy)  
 photosensitivity  
 retina  
 sensitometry  
 visual pigments  
 Young-Helmholtz theory

**photoreconnaissance**

GS reconnaissance  
 . **photoreconnaissance**  
 RT aerial reconnaissance  
 Airborne Integrated Reconnaissance System  
 black and white photography  
 DMSP satellites  
 Earth Resources Survey aircraft  
 ground truth  
 HS-801 aircraft  
 photogrammetry  
 photographic measurement  
 photography  
 photointerpretation  
 spectral reconnaissance

*photoreduction*

USE **photochemical reactions**

**photorefractivity**

(added May 1995)  
 GS electromagnetic properties  
 . optical properties  
 . . refractivity  
 . . . **photorefractivity**  
 reactivity  
 . **photorefractivity**  
 RT crystal optics  
 gratings (spectra)  
 optical waveguides  
 photoluminescence

*photoresistivity*

USE **photoconductivity**

*photoresistors*

USE **photoconductors**

**photoresists**

(added June 2000)  
 DEF Photosensitive substances that are either rendered soluble or insoluble to chemical etchants when exposed to light, and are used in transferring circuit patterns in the production of integrated circuits.  
 RT etching  
 integrated circuits  
 microelectronics  
 photolithography  
 photomasks  
 photopolymers  
 photosensitivity

**photosensitivity**

DEF The property of a material whereby its chemical makeup is altered by exposure to light.  
 GS sensitivity  
 . **photosensitivity**  
 . . light adaptation  
 . . phototropism  
 RT light (visible radiation)  
 photographic emulsions  
 photophilic plants  
 photoreceptors  
 photoresists  
 sensitometry  
 thresholds (perception)

visual pigments

*photosensors*

USE **photoelectricity**  
**radiation measuring instruments**

**photosphere**

DEF The intensely bright portion of the sun visible to the unaided eye.  
 GS **photosphere**  
 . solar granulation  
 RT chromosphere  
 faculae  
 solar atmosphere  
 solar physics  
 spicules  
 starspots  
 stellar activity  
 sun  
 sunspots

**photostresses**

GS stresses  
 . **photostresses**

**photosynthesis**

DEF A process operating in green plants in which carbohydrates are formed under the influence of light with chlorophyll serving as a catalyst.  
 GS chemical reactions  
 . photochemical reactions  
 . . **photosynthesis**  
 RT algae  
 carbohydrates  
 Chlorella  
 chlorophylls  
 chloroplasts  
 crop growth  
 photosynthetically active radiation  
 phytochrome  
 plant physiology  
 respiration

**photosynthetically active radiation**

(added January 2002)  
 DEF Incident natural or artificial radiation of wavelengths that can be used by plants for photosynthesis.  
 GS electromagnetic radiation  
 . **photosynthetically active radiation**  
 RT crop growth  
 insolation  
 irradiance  
 leaf area index  
 photosynthesis  
 ∞ radiation  
 solar radiation  
 vegetation growth

**photothermal conversion**

DEF Conversion into thermal energy from optical radiation by a photoabsorptive or photo-selective material.  
 GS energy conversion  
 . solar energy conversion  
 . . **photothermal conversion**  
 . . . thermophotovoltaic conversion  
 RT ∞ conversion  
 energy absorption films  
 energy conversion efficiency  
 energy technology  
 selectivity  
 solar collectors  
 solar dynamic power systems  
 solar energy absorbers  
 solar reflectors  
 solar thermal electric power plants  
 spectral sensitivity  
 thermal energy  
 thermodynamics

**photothermal deflection spectroscopy**

(added November 1998)  
 UF *PDS (spectroscopy)*  
 GS spectroscopy  
 . **photothermal deflection spectroscopy**  
 RT optical measurement

photoacoustic spectroscopy  
 thermal diffusivity  
 thermal lensing

*photothermotropism*

USE **anisotropy**  
**phototropism**  
**temperature effects**

**phototransistors**

GS electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . transistors  
 . . . . **phototransistors**  
 optoelectronic devices  
 . **phototransistors**  
 RT junction transistors  
 photoconductors  
 photodiodes  
 photoelectric cells  
 photoelectric materials  
 photometers  
 phototubes

**phototropism**

UF *photothermotropism*  
 GS sensitivity  
 . photosensitivity  
 . . **phototropism**  
 RT color  
 crop vigor  
 optical properties  
 plant physiology  
 plants (botany)

**phototubes**

GS electron tubes  
 . cold cathode tubes  
 . . **phototubes**  
 . . . photomultiplier tubes  
 . . . . frequency modulation photomultipliers  
 RT cathodes  
 dark current  
 electrodes  
 flying spot scanners  
 gas discharge tubes  
 microwave tubes  
 photodiodes  
 photoelectric cells  
 photoelectric materials  
 phototransistors

**photoviscoelasticity**

GS electromagnetic properties  
 . optical properties  
 . . **photoviscoelasticity**  
 photoelasticity  
 . . **photoviscoelasticity**  
 mechanical properties  
 . elastic properties  
 . . photoelasticity  
 . . . **photoviscoelasticity**  
 . . viscoelasticity  
 . . . **photoviscoelasticity**

**photovoltages**

GS potential energy  
 . electric potential  
 . . **photovoltages**  
 RT photoelectric emission  
 photoelectricity  
 photovoltaic effect  
 threshold voltage

**photovoltaic cells**

DEF Photoelectric detectors capable of directly generating an electric current in response to irradiation.  
 GS electric generators  
 . direct power generators  
 . . photoelectric generators  
 . . . **photovoltaic cells**  
 . . . . solar cells  
 . . . . . vertical junction solar cells  
 electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . **photovoltaic cells**

## photovoltaic conversion

. . . . solar cells  
. . . . vertical junction solar cells  
photoelectric cells  
. **photovoltaic cells**  
. . . solar cells  
. . . vertical junction solar cells  
RT amorphous silicon  
∞ cells  
electrochemical cells  
photoconductive cells  
photoelectric materials  
short circuit currents  
SIS (semiconductors)  
solar generators

### photovoltaic conversion

GS energy conversion  
. solar energy conversion  
. . **photovoltaic conversion**  
. . . thermophotovoltaic conversion  
RT ∞ conversion  
photovoltaic effect  
solar arrays  
solar cells

### photovoltaic effect

DEF The production of a voltage difference across a pn junction resulting from the absorption of photon energy. The voltage difference is caused by the internal drift of holes and electrons.  
GS electrical properties  
. **photovoltaic effect**  
photoelectricity  
. photoelectric effect  
. . **photovoltaic effect**  
RT ∞ effects  
photoelectric emission  
photoelectrons  
photovoltages  
photovoltaic conversion  
threshold voltage

### phreatophytes

GS plants (botany)  
. **phreatophytes**  
RT trees (plants)

### phthalates

GS esters  
. **phthalates**

### phthalimides

(added August 2004)  
DEF The imide of phthalic acids.  
GS nitrogen compounds  
. imides  
. . **phthalimides**  
RT amides

### phthalocyanin

GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **phthalocyanin**  
RT pigments

### phugoid oscillations

USE **oscillations**  
**pitch (inclination)**

### phylloquinone

UF *vitamin K*  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **phylloquinone**  
. lipids  
. . **phylloquinone**  
vitamins  
. **phylloquinone**  
RT osteocalcin

### physical chemistry

DEF The application of the laws, principles, and techniques of physics to the study of chemical properties, transformations, and reactions.  
GS **physical chemistry**  
. cryochemistry  
. quantum chemistry

RT aerothermochemistry  
atmospheric chemistry  
chemical analysis  
∞ chemistry  
computational chemistry  
molecular dynamics  
nuclear chemistry  
∞ physics  
thermochemistry  
thermodynamics

### physical constants testing reactor

USE **nuclear research and test reactors**  
**water cooled reactors**

### physical endurance

USE **physical fitness**

### physical examinations

RT flight fitness  
mobile quarantine facility  
percussion  
personnel selection

### physical exercise

UF *exercise*  
*gymnastics*  
GS **physical exercise**  
. hyperkinesia  
RT angina pectoris  
athletes  
atrophy  
exercise physiology  
fatigue (biology)  
hypokinesia  
physical fitness  
running  
swimming  
treadmills  
walking

### physical factors

GS physiological factors  
. **physical factors**  
RT ∞ physics  
work

### physical fitness

UF *physical endurance*  
fitness  
GS **physical fitness**  
RT athletes  
competition  
exercise physiology  
flight fitness  
physical exercise  
physiological tests  
posture  
sports medicine  
swimming  
treadmills  
work capacity

### physical optics

RT crystal optics  
fiber optics  
geometrical optics  
gradient index optics  
optical properties  
∞ optics  
quantum optics  
quantum theory  
∞ theories

### ∞ physical properties

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT acoustic properties  
adsorptivity  
Bragg angle  
buoyancy  
chemical properties  
color  
density (mass/volume)  
diffusivity  
durability  
eddy currents  
elastic properties  
electrical properties  
electromagnetic properties

fusibility  
∞ high resistance  
hygroscopicity  
hysteresis  
impedance  
internal friction  
isotropy  
magnetic dipoles  
magnetic properties  
mechanical properties  
optical properties  
permeability  
polymorphism  
propellant properties  
∞ properties  
surface properties  
thermal expansion  
thermodynamic properties  
thixotropy  
transmissivity  
transport properties  
virtual properties  
viscosity

### ∞ physical sciences

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT astronomy  
∞ chemistry  
geology  
life sciences  
∞ metallurgy  
meteorology  
mineralogy  
oceanography  
∞ physics  
∞ science

### physical work

UF *exertion*  
GS work  
. **physical work**  
RT effort  
horsepower  
tasks  
treadmills  
work capacity  
workloads (psychophysiology)

### physicians

GS personnel  
. medical personnel  
. . **physicians**  
RT stethoscopes

### ∞ physics

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT astrophysics  
atmospheric physics  
atomic physics  
biophysics  
branching (physics)  
charm (particle physics)  
cloud physics  
combustion  
combustion physics  
condensed matter physics  
degenerate matter  
electrophysics  
field theory (physics)  
flavor (particle physics)  
geophysics  
health physics  
Health Physics Research Reactor  
kinetics  
low temperature physics  
magnetomechanics (physics)  
matter (physics)  
∞ molecular physics  
neutron physics  
nuclear physics  
nuclei (nuclear physics)  
physical chemistry  
physical factors  
∞ physical sciences  
plasma physics  
plasmas (physics)  
polymer physics

psychophysics  
 quenching (atomic physics)  
 radio physics  
 reactor physics  
 reentry physics  
 rigid rotors (plasma physics)  
 ∞ science  
 selection rules (nuclear physics)  
 solar physics  
 ∞ solid state physics  
 strange attractors  
 theoretical physics

### Physics and Chemistry Experiment in Space

DEF A group of Space Shuttle payloads consisting of various space experiments. Used for PACE.

UF *PACE*

GS experimentation  
 . **Physics and Chemistry Experiment in Space**  
 payloads  
 . Space Shuttle payloads  
 . . **Physics and Chemistry Experiment in Space**  
 spaceborne experiments  
 . **Physics and Chemistry Experiment in Space**

RT ∞ chemistry  
 space flight

### physiochemistry

GS biochemistry  
 . **physiochemistry**  
 RT bioavailability  
 ∞ chemistry  
 exercise physiology  
 molecular biology  
 organic chemistry  
 physiology  
 psychotropic drugs  
 ∞ science

*physiography*

USE **geomorphology**

*physiologic availability*

(added August 2001)

USE **bioavailability**

### physiological acceleration

DEF The acceleration experienced by a human or an animal test subject in an accelerating vehicle.

GS rates (per time)  
 . **physiological acceleration**

RT ∞ acceleration  
 acceleration (physics)  
 acceleration stresses (physiology)  
 deceleration  
 gravitational physiology  
 impact acceleration

### physiological defenses

GS **physiological defenses**  
 . immunity  
 RT acquired immunodeficiency syndrome  
 antibodies  
 antigens  
 biocompatibility  
 ∞ defense  
 immune systems  
 in oculum  
 interferon

### physiological effects

GS **physiological effects**  
 . physiological responses  
 . . hemodynamic responses  
 . apoptosis  
 RT biological effects  
 bone demineralization  
 cholera  
 comfort  
 diving (underwater)  
 ∞ effects  
 electrolyte metabolism  
 environmental engineering  
 environments

exercise physiology  
 fluid shifts (biology)  
 geotopism  
 gonads  
 gravitational physiology  
 head down tilt  
 heat acclimatization  
 heat stroke  
 hematopoiesis  
 hematopoietic system  
 human reactions  
 noise pollution  
 radiation effects  
 reaction time  
 relative biological effectiveness (RBE)  
 shock (physiology)  
 space adaptation syndrome  
 sports medicine

### physiological factors

GS **physiological factors**  
 . physical factors  
 RT astronaut performance  
 chemical defense  
 chemical warfare  
 flight stress (biology)  
 noise pollution  
 sex factor

### physiological responses

GS physiological effects  
 . **physiological responses**  
 . . hemodynamic responses  
 responses  
 . **physiological responses**  
 . . hemodynamic responses  
 RT baroreflexes  
 desynchronization (biology)  
 evoked response (psychophysiology)  
 gravitational physiology  
 head up tilt  
 pathological effects  
 tilt-table test  
 zeitgebers

*physiological telemetry*

USE **biotelemetry**

### physiological tests

GS **physiological tests**  
 . body sway test  
 . carboxyhemoglobin test  
 . ear pressure test  
 . electronystagmography  
 . tilt-table test  
 . vestibular tests  
 . Weber test  
 RT cardiac output  
 cardiography  
 certification  
 environmental index  
 environmental tests  
 mobile quarantine facility  
 personnel selection  
 physical fitness  
 pilot selection  
 psychomotor performance  
 sensorimotor performance  
 stroke volume  
 Taylor manifest anxiety scale  
 ∞ tests  
 treadmills  
 urinalysis

### physiology

DEF The science that treats of the functions of living organisms or their parts, as distinguished from morphology or anatomy.

GS **physiology**  
 . electrophysiology  
 . exercise physiology  
 . gravitational physiology  
 . neuropsychology  
 . plant physiology  
 . psychophysiology  
 . respiratory physiology  
 . underwater physiology  
 RT aging (biology)  
 blood circulation  
 bone demineralization

catabolism  
 cytotogenesis  
 differentiation (biology)  
 digesting  
 heart function  
 hemodynamics  
 homeostasis  
 menstruation  
 metabolism  
 mitosis  
 narcosis  
 physiochemistry  
 regeneration (physiology)  
 regularity  
 respiration  
 ∞ science  
 shock (physiology)  
 stress (physiology)  
 thermoregulation  
 tolerances (physiology)

### phytochrome

(added August 2004)

DEF A blue-green biliprotein widely used in the plant kingdom.

GS biopolymers  
 . proteins  
 . . **phytochrome**  
 organic compounds  
 . proteins  
 . . **phytochrome**  
 pigments  
 . **phytochrome**  
 RT photosynthesis  
 plant physiology  
 plants (botany)  
 vegetation growth

### phytoplankton

DEF The aggregate of passively floating or drifting plant organisms in aquatic ecosystems.

GS plankton  
 . **phytoplankton**  
 plants (botany)  
 . aquatic plants  
 . . **phytoplankton**  
 RT algae  
 dissolved organic matter  
 marine biology  
 Sea-viewing Wide Field-of-view  
 Sensor  
 water pollution  
 zooplankton

### phytotrons

DEF Apparatus for the growth of plants under a variety of controlled environmental conditions. Used for germinators and growth chambers.

UF *germinators*  
*growth chambers*  
 RT germination  
 greenhouses  
 growth  
 plants (botany)

### Piaggio aircraft

GS **Piaggio aircraft**  
 . P-166 aircraft  
 . PD-808 aircraft  
 RT ∞ aircraft

*Piaggio P-166 aircraft*

USE **P-166 aircraft**

*Piaggio-Douglas PD-808 aircraft*

USE **PD-808 aircraft**

### Piasecki aircraft

GS **Piasecki aircraft**  
 . VZ-8 aircraft  
 RT ∞ aircraft

### pickling (metallurgy)

DEF Preferential removal of oxide or mill scale from the surface of a metal by immersion usually in an acidic or alkaline solution.

GS cleaning  
 . chemical cleaning  
 . . **pickling (metallurgy)**

## picosecond pulses

RT descaling  
metal films  
metal finishing  
scale (corrosion)

*pickoffs*  
USE **sensors**

*pickups*  
USE **sensors**

### picosecond pulses

GS pulses  
. **picosecond pulses**  
RT amplitudes  
electromagnetic missiles  
electromagnetic pulses  
laser outputs  
pulse rate  
pulsed radiation  
time signals

### picrates

GS nitrogen compounds  
. nitro compounds  
. . . **picrates**  
. . . ammonium picrates

### picture elements

USE **pixels**

### picture tubes

UF *kinescopes*  
GS electron tubes  
. vacuum tubes  
. . . cathode ray tubes  
. . . . **picture tubes**  
video equipment  
. **picture tubes**  
RT display devices  
flying spot scanners  
raster scanning  
television equipment

### PIDV (velocimetry)

USE **particle image velocimetry**

### piedmonts

UF *pediments*  
*pediplains*  
GS landforms  
. terraces (landforms)  
. . . plateaus  
. . . . **piedmonts**  
. . . . Central Piedmont (US)  
RT coastal plains  
mountains

### pi-electrons

GS particles  
. charged particles  
. . . energetic particles  
. . . . electrons  
. . . . . **pi-electrons**  
. corpuscular radiation  
. . . energetic particles  
. . . . electrons  
. . . . . **pi-electrons**  
. elementary particles  
. . . fermions  
. . . . leptons  
. . . . . electrons  
. . . . . . **pi-electrons**  
RT molecular electronics  
nuclear particles

### piercing

UF *puncturing*  
RT cutting  
drilling  
extruding  
forging  
metal working  
penetration  
perforating  
∞ perforation  
spark machining

vulnerability

*piers*  
USE **wharves**

*piezoactuators*  
(added January 2001)  
USE **piezoelectric actuators**

### piezoelectric actuators

(added January 2001)  
DEF Any actuator that uses the piezoelectric effect as a basis for its function.  
UF *piezoactuators*  
GS actuators  
. **piezoelectric actuators**  
electromechanical devices  
. **piezoelectric actuators**  
RT active control  
microelectromechanical systems  
piezoelectric motors  
piezoelectric transducers  
smart materials  
smart structures  
ultrasonic wave transducers  
vibration damping

### piezoelectric ceramics

DEF Ceramic material with piezoelectric properties similar to those of some natural crystals.  
GS ceramics  
. **piezoelectric ceramics**  
RT lead zirconate titanates  
smart materials

### piezoelectric crystals

GS crystals  
. crystal oscillators  
. . . **piezoelectric crystals**  
oscillators  
. crystal oscillators  
. . . **piezoelectric crystals**  
RT microsionics  
piezoresistive transducers  
quartz transducers  
single crystals

### piezoelectric gages

GS measuring instruments  
. pressure gages  
. . . **piezoelectric gages**  
transducers  
. piezoelectric transducers  
. . . **piezoelectric gages**  
. piezoresistive transducers  
. . . **piezoelectric gages**  
RT pressure sensors  
strain gages

### piezoelectric motors

(added January 2001)  
DEF Any motor that uses the piezoelectric effect to produce its mechanical output.  
UF *piezomotors*  
GS electromechanical devices  
. electric motors  
. . . **piezoelectric motors**  
motors  
. electric motors  
. . . **piezoelectric motors**  
RT microelectromechanical systems  
micromotors  
piezoelectric actuators  
piezoelectric transducers  
ultrasonic wave transducers

### piezoelectric transducers

DEF Transducers that depend for their operation on the interaction between electric charge and the deformation of certain materials having piezoelectric properties. Note: Some crystals and specially processed ceramics have piezoelectric properties.  
GS transducers  
. **piezoelectric transducers**  
. . . piezoelectric gages  
RT interdigital transducers  
piezoelectric actuators  
piezoelectric motors

praetersonic devices  
ultrasonic cleaning

### piezoelectricity

DEF The property exhibited by some asymmetrical crystalline materials which when subjected to strain in suitable directions develop polarization proportional to the strain.  
GS electrical properties  
. **piezoelectricity**  
mechanical properties  
. **piezoelectricity**  
RT crystal oscillators  
elastic properties  
electricity  
electrostriction  
piezoresistive transducers  
pyroelectricity

### piezometers

GS measuring instruments  
. pressure gages  
. . . **piezometers**  
RT seepage

### piezomotors

(added January 2001)  
USE **piezoelectric motors**

### piezoresistive transducers

GS transducers  
. **piezoresistive transducers**  
. . . piezoelectric gages  
RT piezoelectric crystals  
piezoelectricity

### pigeons

GS animals  
. vertebrates  
. . . birds  
. . . . **pigeons**

### piggyback systems

RT air launching  
multistage rocket vehicles  
payload mass ratio  
payloads  
Saenger space transportation system  
∞ systems

### pigments

GS **pigments**  
. carotene  
. carotenoids  
. chlorophylls  
. cytochromes  
. melanin  
. phytochrome  
. visual pigments  
RT additives  
albinism  
anatase  
chromophores  
dopa  
fillers  
inks  
myoglobin  
paints  
phthalocyanin  
plastids  
rutile  
skin (anatomy)

### pigs (swine)

USE **swine**

### Pike's Peak (CO)

GS landforms  
. peaks (landforms)  
. . . **Pike's Peak (CO)**  
RT Colorado  
mountains

### pile foundations

GS foundations  
. **pile foundations**

- RT ∞ piles
- ∞ **piles**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT nuclear reactors  
pile foundations
- pilocarpine**
- GS bases (chemical)  
. alkaloids  
. . . **pilocarpine**  
nitrogen compounds  
. alkaloids  
. . . **pilocarpine**  
organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . alkaloids  
. . . . **pilocarpine**
- pilot error**
- UF *flight technical error*  
GS errors  
. **pilot error**
- RT aircraft accidents  
collisions  
crash landing  
crashes  
human factors engineering  
human performance  
midair collisions  
pilot induced oscillation
- pilot induced oscillation**
- DEF Oscillations of a flying aircraft caused by transients and system changeovers, by pilot overreaction upon such transients, or by misleading pilot cues or excessive pilot gain in modern high-gain, high order aircraft control systems.
- RT aerodynamic stability  
aircraft control  
aircraft stability  
control stability  
high gain  
longitudinal control  
man machine systems  
nonstabilized oscillation  
pilot error  
pilot performance  
self induced vibration  
stable oscillations  
transient oscillations
- pilot landing aid television system*  
USE **PLAT system**
- pilot opinion ratings*  
(added August 1999)  
USE **pilot ratings**
- pilot performance**
- GS human performance  
. **pilot performance**  
. . . blackout prevention
- RT aircraft performance  
astronaut performance  
flight fatigue  
intravehicular activity  
man operated propulsion systems  
operator performance  
∞ performance  
pilot induced oscillation  
psychomotor performance  
sensorimotor performance  
situational awareness
- pilot plants**
- RT industrial plants  
models  
product development  
prototypes
- pilot ratings**  
(added August 1999)
- DEF Subjective assessment of the handling and stability characteristics of an aircraft or other flight vehicle.
- UF *pilot opinion ratings*
- GS flight characteristics  
. **pilot ratings**  
. . . Cooper-Harper ratings  
ratings  
. **pilot ratings**  
. . . Cooper-Harper ratings
- RT aircraft performance  
assessments  
controllability  
helicopter performance
- pilot selection**
- GS selection  
. personnel selection  
. . . **pilot selection**
- RT physiological tests  
psychological tests
- pilot support systems**  
(added October 1997)
- SN (LIMITED TO ADVANCED FLIGHT VEHICLE SYSTEMS FOR INTEGRATING, INTERPRETING, AND PRESENTING FLIGHT OR MISSION RELATED INFORMATION)  
cockpit assistant systems  
*Pilot's Associate*
- UF information systems  
GS information systems  
. **pilot support systems**  
support systems  
. **pilot support systems**
- RT artificial intelligence  
automatic pilots  
avionics  
cockpits  
decision support systems  
expert systems  
flight management systems  
human-computer interface  
knowledge based systems  
man machine systems  
situational awareness
- pilot training**
- GS education  
. flight training  
. . . **pilot training**
- RT astronaut training  
aviation psychology  
ejection injuries  
ejection training  
flight simulators  
space flight training  
training simulators
- piloted centrifuges*  
USE **human centrifuges**
- pilotless aircraft**
- SN (AIR VEHICLES USING REMOTE OR AUTONOMOUS CONTROL)  
UF *Darkstar unmanned aerial vehicle*  
*unmanned aerial vehicles*
- GS **pilotless aircraft**  
. drone aircraft  
. . . target drone aircraft  
. . . . Firebee 2 target drone aircraft  
. . . . Jindivik target aircraft  
. . . . X-45 aircraft
- RT ∞ aircraft  
balloons  
drone vehicles  
light aircraft  
∞ military aircraft  
oblique wings  
planetary aerial vehicles  
reconnaissance aircraft  
remotely piloted vehicles  
unmanned aircraft systems
- ∞ **pilots**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aircraft pilots  
automatic pilots  
pilots (personnel)  
test pilots
- pilots (personnel)**
- GS personnel  
. flying personnel
- . . . **pilots (personnel)**  
. . . . aircraft pilots  
. . . . . test pilots  
operators (personnel)  
. . . **pilots (personnel)**  
. . . . aircraft pilots  
. . . . . test pilots
- RT astronauts  
cosmonauts  
crews  
flight crews  
∞ pilots
- Pilot's Associate*  
(added October 1997)  
USE **pilot support systems**
- p-i-n diodes*  
USE **diodes**  
**p-i-n junctions**
- p-i-n junctions**
- UF *p-i-n diodes*  
GS semiconductor junctions  
. **p-i-n junctions**
- RT diodes  
∞ junctions  
solar cells
- pinch effect**
- DEF The result of an electromechanical force that constricts, and sometimes momentarily ruptures, a molten conductor carrying current at a high density. The self contradiction of a plasma column carrying large currents due to the interaction of this current with its own magnetic field.
- GS **pinch effect**  
. plasma pinch  
. . . screw pinch  
. . . theta pinch  
. . . zeta pinch  
. . . reverse field pinch
- RT cylindrical plasmas  
∞ effects  
magnetic fields  
magnetohydrodynamics  
plasma compression  
plasma control  
relativistic plasmas  
stellarators  
thermonuclear power generation  
thermonuclear reactions  
zeta thermonuclear reactor
- pineal gland**
- GS anatomy  
. glands (anatomy)  
. . . endocrine glands  
. . . . **pineal gland**  
. . . nervous system  
. . . central nervous system  
. . . . brain  
. . . . . diencephalon  
. . . . . **pineal gland**
- RT melatonin
- pinhole cameras**
- DEF Cameras which have no lenses, but consist essentially of a darkened box with a small hole in one side, so that an inverted image of outside objects is projected on the opposite side where it is recorded on photographic film.
- GS optical equipment  
. cameras  
. . . **pinhole cameras**  
photographic equipment  
. cameras  
. . . **pinhole cameras**
- RT apertures  
photography  
Pinhole Occulter Facility  
pinholes
- Pinhole Occulter Facility**
- GS observatories  
. astronomical observatories  
. . . solar observatories  
. . . . **Pinhole Occulter Facility**
- RT occultation



## pinholes

pinhole cameras  
pinholes  
spaceborne astronomy

### pinholes

RT casting  
castings  
defects  
interstices  
leakage  
pinhole cameras  
Pinhole Occluder Facility  
porosity

### pinnacles

USE **peaks (landforms)**

### pinning

SN (LIMITED TO ELECTRONICS)  
DEF Sites within a superconducting material that are produced by localizing inclusions, dislocations, voids, etc., which provide a means of resisting flux motion (flux jumps) due to Lorenz forces. SN (limited to electronics).  
GS **pinning**  
. flux pinning  
RT crystal defects  
crystal dislocations  
current density  
magnetic flux  
superconductors (materials)

### pins

GS fasteners  
. **pins**  
RT couplings  
holders  
latches  
rivets  
∞ spikes  
studs (structural members)

### pintles

RT pivots  
rudders  
shafts (machine elements)

### pion beams

GS beams (radiation)  
. particle beams  
. **pion beams**  
RT neutral beams  
neutron beams

### Pioneer 1 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 1 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 1 space probe**  
RT Thor Able rocket vehicle

### Pioneer 2 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 2 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 2 space probe**

### Pioneer 3 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 3 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 3 space probe**  
RT Juno 2 launch vehicle

### Pioneer 4 lunar probe

USE **Pioneer 4 space probe**

### Pioneer 4 space probe

UF *Pioneer 4 lunar probe*  
GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 4 space probe**

unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 4 space probe**  
RT Juno 2 launch vehicle

### Pioneer 5 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 5 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 5 space probe**  
RT Thor Able rocket vehicle

### Pioneer 6 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 6 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 6 space probe**  
RT Delta launch vehicle  
Juno 2 launch vehicle

### Pioneer 7 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 7 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 7 space probe**  
RT Delta launch vehicle  
Juno 2 launch vehicle

### Pioneer 8 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 8 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 8 space probe**  
RT Juno 2 launch vehicle  
∞ probes

### Pioneer 9 space probe

GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 9 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 9 space probe**  
RT ∞ probes

### Pioneer 10 space probe

UF *Pioneer F space probe*  
GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 10 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 10 space probe**  
RT ∞ probes

### Pioneer 11 space probe

UF *Pioneer G space probe*  
*Pioneer Saturn spacecraft*  
GS interplanetary spacecraft  
. Pioneer space probes  
. **Pioneer 11 space probe**  
unmanned spacecraft  
. space probes  
. Pioneer space probes  
. **Pioneer 11 space probe**

RT ∞ probes

### Pioneer 12 space probe

USE **Pioneer Venus spacecraft**

### Pioneer F space probe

USE **Pioneer 10 space probe**

### Pioneer G space probe

USE **Pioneer 11 space probe**

### Pioneer project

GS programs  
. NASA programs  
. NASA space programs  
. **Pioneer project**  
. projects  
. **Pioneer project**  
. space programs  
. NASA space programs  
. **Pioneer project**  
RT lunar probes  
Pioneer space probes  
space probes

### Pioneer Saturn spacecraft

USE **Pioneer 11 space probe**

### Pioneer space probes

GS interplanetary spacecraft  
. **Pioneer space probes**  
. Pioneer 1 space probe  
. Pioneer 2 space probe  
. Pioneer 3 space probe  
. Pioneer 4 space probe  
. Pioneer 5 space probe  
. Pioneer 6 space probe  
. Pioneer 7 space probe  
. Pioneer 8 space probe  
. Pioneer 9 space probe  
. Pioneer 10 space probe  
. Pioneer 11 space probe  
. Pioneer Venus 2 entry probes  
. Pioneer Venus 2 night probe  
. Pioneer Venus 2 sounder probe  
unmanned spacecraft  
. space probes  
. **Pioneer space probes**  
. Pioneer 1 space probe  
. Pioneer 2 space probe  
. Pioneer 3 space probe  
. Pioneer 4 space probe  
. Pioneer 5 space probe  
. Pioneer 6 space probe  
. Pioneer 7 space probe  
. Pioneer 8 space probe  
. Pioneer 9 space probe  
. Pioneer 10 space probe  
. Pioneer 11 space probe  
. Pioneer Venus 2 entry probes  
. Pioneer Venus 2 night probe  
. Pioneer Venus 2 sounder probe  
RT Juno 2 launch vehicle  
Pioneer project  
Pioneer Venus 1 spacecraft  
Pioneer Venus 2 spacecraft  
Pioneer Venus spacecraft  
solar probes

### Pioneer Venus 1 spacecraft

DEF This orbiter spacecraft is the first of two launched on a seven month journey to observe the planet Venus, its atmosphere and clouds. It was launched May 20, 1978 and is still operational. Used for Pioneer Venus Orbiter.

UF *Pioneer Venus Orbiter*

GS interplanetary spacecraft  
. Pioneer Venus spacecraft  
. **Pioneer Venus 1 spacecraft**  
unmanned spacecraft  
. Pioneer Venus spacecraft  
. **Pioneer Venus 1 spacecraft**

RT Pioneer space probes

∞ probes  
space probes

### Pioneer Venus 2 entry probes

DEF Collective term for the five Pioneer Venus atmospheric probes. They are Pioneer Venus 2 day probe, Pioneer Venus 2 night

probe, Pioneer Venus 2 North probe, Pioneer Venus 2 sounder probe, and Pioneer Venus 2 transporter bus.

GS interplanetary spacecraft  
 . Pioneer space probes  
 . . **Pioneer Venus 2 entry probes**  
 . . . Pioneer Venus 2 night probe  
 . . . Pioneer Venus 2 sounder probe  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 entry probes**  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 entry probes**  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . unmannned spacecraft  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 entry probes**  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . space probes  
 . . Pioneer space probes  
 . . . **Pioneer Venus 2 entry probes**  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . . **Pioneer Venus 2 entry probes**  
 . . . . . Pioneer Venus 2 night probe  
 . . . . . Pioneer Venus 2 sounder probe  
 . . . . . probe

RT ∞ probes

*Pioneer Venus 2 Multiprobe spacecraft*

USE **Pioneer Venus 2 spacecraft**

**Pioneer Venus 2 night probe**

GS interplanetary spacecraft  
 . Pioneer space probes  
 . . Pioneer Venus 2 entry probes  
 . . . **Pioneer Venus 2 night probe**  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 night probe**  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 night probe**  
 . unmannned spacecraft  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 night probe**  
 . space probes  
 . . Pioneer space probes  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 night probe**  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 night probe**

RT ∞ probes

**Pioneer Venus 2 sounder probe**

GS interplanetary spacecraft  
 . Pioneer space probes  
 . . Pioneer Venus 2 entry probes  
 . . . **Pioneer Venus 2 sounder probe**  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 sounder probe**  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 sounder probe**  
 . unmannned spacecraft  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 sounder probe**  
 . space probes

. . . Pioneer space probes  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 sounder probe**  
 . . . Venus probes  
 . . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . **Pioneer Venus 2 sounder probe**

**Pioneer Venus 2 spacecraft**

DEF This multiprobe spacecraft, launched on its Venus mission in August 1978, comprises a Transporter Bus, a sounder probe, and three identical probes (North, night, and day) which separately investigated and photographed the atmosphere, clouds and related phenomena. The multiprobe spacecraft traveled about 354 million kilometers. It entered Venus atmosphere on December 9, 1978 and all probes transmitted data. Used for Pioneer Venus 2 Multiprobe spacecraft.

UF *Pioneer Venus 2 Multiprobe spacecraft*

GS interplanetary spacecraft  
 . Pioneer Venus spacecraft  
 . . **Pioneer Venus 2 spacecraft**  
 . . . Pioneer Venus 2 entry probes  
 . . . Pioneer Venus 2 night probe  
 . . . Pioneer Venus 2 sounder probe  
 . . . Pioneer Venus 2 transporter bus  
 . Venus probes  
 . . **Pioneer Venus 2 spacecraft**  
 . . . Pioneer Venus 2 entry probes  
 . . . Pioneer Venus 2 night probe  
 . . . Pioneer Venus 2 sounder probe  
 . . . Pioneer Venus 2 transporter bus  
 . unmannned spacecraft  
 . Pioneer Venus spacecraft  
 . . **Pioneer Venus 2 spacecraft**  
 . . . Pioneer Venus 2 entry probes  
 . . . Pioneer Venus 2 night probe  
 . . . Pioneer Venus 2 sounder probe  
 . . . Pioneer Venus 2 transporter bus  
 . space probes  
 . . Venus probes  
 . . . **Pioneer Venus 2 spacecraft**  
 . . . . Pioneer Venus 2 entry probes  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . . . . probe

RT Pioneer space probes

∞ probes  
 ∞ spacecraft

**Pioneer Venus 2 transporter bus**

GS interplanetary spacecraft  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 transporter bus**  
 . Venus probes  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 transporter bus**  
 . unmannned spacecraft  
 . Pioneer Venus spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . **Pioneer Venus 2 transporter bus**  
 . space probes  
 . . Venus probes  
 . . . Pioneer Venus 2 spacecraft  
 . . . . **Pioneer Venus 2 transporter bus**

RT ∞ probes

*Pioneer Venus Orbiter*

USE **Pioneer Venus 1 spacecraft**

**Pioneer Venus spacecraft**

UF *Pioneer 12 space probe*  
 GS interplanetary spacecraft  
 . **Pioneer Venus spacecraft**  
 . . Pioneer Venus 1 spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe

. . . Pioneer Venus 2 transporter bus  
 . unmannned spacecraft  
 . **Pioneer Venus spacecraft**  
 . . Pioneer Venus 1 spacecraft  
 . . Pioneer Venus 2 spacecraft  
 . . . Pioneer Venus 2 entry probes  
 . . . . Pioneer Venus 2 night probe  
 . . . . Pioneer Venus 2 sounder probe  
 . . . Pioneer Venus 2 transporter bus

RT Pioneer space probes  
 ∞ probes  
 space probes

**pions**

GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . **pions**  
 . . . hadrons  
 . . . mesons  
 . . . . **pions**  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . **pions**  
 RT baryons  
 charged particles  
 kaons

**pipe flow**

UF *Kirchhoff-Helmholtz flow*  
 GS fluid flow  
 . gas flow  
 . . **pipe flow**  
 . internal flow  
 . . **pipe flow**  
 . parallel flow  
 . . **pipe flow**  
 RT cavity flow  
 channel flow  
 choked flow  
 critical flow  
 flow noise  
 laminar flow  
 liquid flow  
 mass flow  
 multiphase flow  
 open channel flow  
 orifice flow  
 pipes (tubes)  
 pressure gradients  
 single-phase flow  
 steady flow  
 steam flow  
 subcritical flow  
 supercritical flow  
 turbulent flow  
 uniform flow  
 unsteady flow  
 water flow  
 water hammer  
 water pressure

**pipe nozzles**

RT exhaust systems  
 inlet nozzles  
 intake systems  
 nozzle geometry  
 ∞ nozzles  
 openings  
 outlets  
 tanks (containers)

**pipelines**

GS **pipelines**  
 . sewers  
 RT crossings  
 ∞ lines  
 materials handling  
 pipes (tubes)  
 pumps  
 siphons  
 steam flow  
 ∞ storage  
 storage tanks  
 transportation  
 waste disposal

## pipelining (computers)

water hammer

### pipelining (computers)

DEF Processing techniques for improving the capability of computer systems by modeling, sequencing control, resource allocation, etc.

GS data processing

. **pipelining (computers)**

RT associative processing (computers)

data processing equipment

multiprocessing (computers)

multiprogramming

parallel programming

RISC processors

time sharing

vector processing (computers)

### Piper aircraft

GS light aircraft

. **Piper aircraft**

. . PA-34 Seneca aircraft

RT  $\infty$  aircraft

general aviation aircraft

### piperidine

GS bases (chemical)

. **piperidine**

organic compounds

. cyclic compounds

. . heterocyclic compounds

. . . **piperidine**

RT pyridines

### pipes (tubes)

UF *tubing*

GS **pipes (tubes)**

. gas pipes

. U bends

RT  $\infty$  casing

circular tubes

ducts

fluid flow

$\infty$  headers

hoses

$\infty$  hydraulics

internal flow

manifolds

pipe flow

pipelines

risers

siphons

syringes

$\infty$  tubes

### pipettes

RT burettes

glassware

laboratory equipment

### Pirani gages

GS measuring instruments

. pressure gages

. . vacuum gages

. . . **Pirani gages**

vacuum apparatus

. vacuum gages

. . **Pirani gages**

RT hot-wire flowmeters

ionization gages

Knudsen gages

Mcleod gages

pressure measurement

### piston engines

DEF Engines, especially internal combustion engines, in which a piston or pistons moving back and forth work upon a crankshaft or other device to create rotational movement. Used for reciprocating engines.

UF *reciprocating engines*

GS engines

. **piston engines**

. . diesel engines

. . free-piston engines

. . Stirling engines

RT

aircraft engines

automobile engines

external combustion engines

fuel injection

internal combustion engines

pistons

reciprocation

rotary engines

Wankel engines

### piston theory

RT compressing

fluid dynamics

pistons

$\infty$  theories

### pistons

GS **pistons**

. magnetic pistons

RT combustion chambers

engine parts

free-piston engines

internal combustion engines

piston engines

piston theory

plungers

reciprocation

*PIT (rocket engines)*

*(added April 2001)*

USE **pulsed inductive thrusters**

$\infty$  **pitch**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *tone*

RT frequencies

pitch (inclination)

pitch (material)

### pitch (inclination)

DEF Of a vehicle, an angular displacement about an axis parallel to the lateral axis of the vehicle. Used for damping in pitch, phugoid oscillations, and pitch angles.

UF *damping in pitch*

*phugoid oscillations*

*pitch angles*

GS attitude (inclination)

. **pitch (inclination)**

RT angles (geometry)

heaving

longitudinal control

longitudinal stability

$\infty$  motion

$\infty$  pitch

roll

rotation

slopes

stability augmentation

variable pitch propellers

yaw

### pitch (material)

DEF The residues from the destructive distillation of tars.

RT asphalt

oils

$\infty$  pitch

tars

*pitch angles*

USE **pitch (inclination)**

*pitch attitude control*

USE **longitudinal control**

### pitching moments

GS moments

. stability derivatives

. . **pitching moments**

RT aerodynamic coefficients

longitudinal stability

moments of inertia

rolling moments

torque

yawing moments

### pitot tubes

DEF Open ended tubes or tube arrangements which, when pointed upstream, may be used to measure the stagnation pressure of the fluid for subsonic flow; or the stagnation pressure behind the tube's normal shock wave for

supersonic flow. (Pronounced pee-toe. After Henri Pitot, 1695-1771, French scientist.) Used for Preston tubes.

UF *Preston tubes*

RT flow measurement

flowmeters

pressure measurement

protuberances

speed indicators

static pressure

$\infty$  tubes

velocity measurement

Venturi tubes

$\infty$  **pits**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT pits (excavations)

pitting

### pits (excavations)

RT boreholes

excavation

mines (excavations)

$\infty$  pits

sumps

### pitting

RT chemical attack

chipping

corrosion

corrosion resistance

corrosion tests

degradation

erosion

erosive burning

etching

hot corrosion

metal-water reactions

$\infty$  pits

scoring

### pituitary gland

UF *hypophysis*

GS anatomy

. glands (anatomy)

. . endocrine glands

. . . **pituitary gland**

RT brain

hypothalamus

vasopressins

### pituitary hormones

UF *growth hormone*

GS secretions

. endocrine secretions

. . hormones

. . . **pituitary hormones**

. . . . adrenocorticotropin (ACTH)

. . . . vasopressins

*PIV (velocimetry)*

USE **particle image velocimetry**

*pivoted wing aircraft*

USE **tilt wing aircraft**

### pivots

DEF The paths followed by a point in a diameter of a circle as the circle rolls along in a straight line. Used for trochoids.

UF *trochoids*

RT bearings

gimbals

hinges

intiles

shafts (machine elements)

supports

swivels

*PIX*

USE **plasma interaction experiment**

### pixels

DEF Shortened term for 'picture elements.' They are image resolution elements in vidicon-type detectors. Used for picture elements.

UF *picture elements*

RT aerial photography

electrophotometry

- imaging techniques
  - photographs
  - photography
  - remote sensing
  - satellite imagery
  - spectral mixture analysis
  - vidicons
- PL/1**
- GS languages
    - . programming languages
    - . . **PL/1**
  - RT Cobol
    - compilers
    - computer programming
    - FORTRAN
    - machine oriented languages
- plages (faculae)*
- USE **faculae**
- plagioclase**  
(added August 2004)
- DEF A family of feldspar minerals with formulas ranging from pure sodium aluminum silicate (albite) to pure calcium aluminum silicate (anorthite).
- GS aluminum compounds
    - . aluminum silicates
    - . . feldspars
    - . . . **plagioclase**
    - minerals
    - . feldspars
    - . . **plagioclase**
    - silicon compounds
    - . silicates
    - . . aluminum silicates
    - . . . feldspars
    - . . . . **plagioclase**
  - RT aluminum oxides
    - calcium silicates
    - sodium silicates
- plains**
- DEF Any flat areas, large or small, at a low elevation; specifically, extensive regions of comparatively smooth and level or gently undulating land, having few or no prominent surface irregularities. Plains sometime have a considerable slope, and usually at a low elevation with reference to surrounding areas. Plains may be either forested or bare of trees, and may be formed by deposition or by erosion.
- GS land
    - . **plains**
    - . . coastal plains
    - . . flood plains
    - . . Llanos Orientales (Colombia)
    - . . pampas
    - . . playas
    - . . tundra
    - landforms
    - . **plains**
    - . . coastal plains
    - . . flood plains
    - . . Llanos Orientales (Colombia)
    - . . pampas
    - . . playas
    - . . tundra
  - RT farmlands
    - flats (landforms)
    - geography
    - grasslands
    - Great Plains Corridor (North America)
    - plateaus
    - steppes
    - topography
    - wilderness
- plan position indicators**
- DEF Display devices on which target blips are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle. Used for PPI (position indicators).
- UF *PPI (position indicators)*
  - GS display devices
    - . position indicators
    - . . **plan position indicators**
- . radarscopes
  - . . **plan position indicators**
  - measuring instruments
  - . indicating instruments
  - . . position indicators
  - . . . **plan position indicators**
  - radar equipment
  - . radarscopes
  - . . **plan position indicators**
- planar structures**
- RT flat layers
  - flat plates
  - flat surfaces
  - flatness
  - ∞ structures
  - surface properties
- Plancks constant**
- GS constants
    - . **Plancks constant**
  - RT black body radiation
    - de Broglie wavelengths
    - electromagnetic radiation
    - nuclear magnetic resonance
    - photons
    - quantum theory
    - thermal radiation
    - Wentzel-Kramer-Brillouin method
- plane strain**
- DEF A deformation of a body in which the displacement of all points in the body are parallel to a given plane, and the displacement values are not dependent on the distance perpendicular to the plane.
- RT crack propagation
  - elastic deformation
  - fracture mechanics
  - plane stress
  - plastic deformation
  - stress intensity factors
  - stress-strain relationships
- plane stress**
- GS stresses
    - . **plane stress**
  - RT loads (forces)
  - plane strain
  - stress concentration
- plane waves**
- GS longitudinal waves
    - . **plane waves**
  - RT beams (radiation)
  - cylindrical waves
  - elastic waves
  - evanescent waves
  - normal shock waves
  - ∞ radiation
  - shock waves
  - solitary waves
  - sound waves
  - spatial filtering
  - spherical waves
  - transverse waves
  - traveling waves
  - ∞ waves
- planet detection**  
(added January 2003)
- DEF Detection of extrasolar planets using any of a number of direct and indirect observation techniques including astrometry, transit photometry, Doppler spectroscopy, and ground and space-based interferometry.
- UF *exoplanet detection*
  - extrasolar planet detection*
  - GS detection
    - . **planet detection**
  - RT astrometry
    - astronomical interferometry
    - astronomical photometry
    - extrasolar planets
    - Kepler mission
    - planetary systems
- planet ephemerides**
- GS ephemerides
    - . **planet ephemerides**
- RT geocentric coordinates
  - planets
- planet origins*
- USE **planetary evolution**
- planet X*  
(added June 1998)
- USE **hypothetical planets**
- planetariums**
- RT astronomical models
  - display devices
- planetary aerial vehicles**  
(added November 2006)
- DEF Aircraft capable of flight in planetary and satellite atmospheres, and configured to support surface and atmospheric exploration missions.
- UF *planetary aircraft*
  - RT ∞ aircraft
    - pilotless aircraft
    - space exploration
- planetary aircraft*  
(added November 2006)
- USE **planetary aerial vehicles**
- planetary atmospheres**
- SN (EXCLUDES EARTH ATMOSPHERE)
  - GS environments
    - . extraterrestrial environments
    - . . planetary environments
    - . . . **planetary atmospheres**
    - . . . . helium hydrogen atmospheres
    - . . . . Jupiter atmosphere
    - . . . . Mars atmosphere
    - . . . . Mercury atmosphere
    - . . . . Neptune atmosphere
    - . . . . planetary ionospheres
    - . . . . Pluto atmosphere
    - . . . . Saturn atmosphere
    - . . . . Uranus atmosphere
    - . . . . Venus atmosphere
    - . . . . . Venus clouds
  - RT ∞ absorption
  - ∞ atmospheres
    - atmospheric attenuation
    - atmospheric composition
    - atmospheric density
    - atmospheric energy sources
    - atmospheric temperature
    - Earth analogs
    - Earth atmosphere
    - ionopause
    - Juno mission
    - lunar atmosphere
    - nongray atmospheres
    - Nozomi Mars Orbiter
    - organic solids
    - planetary meteorology
    - planetary rings
    - primitive Earth atmosphere
    - radiative transfer
    - radio occultation
    - satellite atmospheres
    - Saturn rings
    - solar planetary interactions
    - terraforming
- planetary bases**
- GS space bases
    - . **planetary bases**
    - . . Mars bases
  - RT extraterrestrial resources
    - in situ resource utilization
    - space exploration
    - stations
- planetary boundary layer**
- DEF The layer of the atmosphere from the Earth's surface to the geostrophic wind level, including the surface boundary layer and the Ekman layer.
- GS boundary layers
    - . **planetary boundary layer**
  - RT atmospheric boundary layer

## planetary composition

core-mantle boundary

### planetary composition

GS composition (property)  
. **planetary composition**  
RT Earth planetary structure  
extraterrestrial water  
gas giant planets  
Juno mission  
Jupiter rings  
Saturn rings  
siderophile elements  
space exploration  
structural properties (geology)

### planetary cores

DEF The centers of planets.  
GS cores  
. **planetary cores**  
. . Earth core  
RT core-mantle boundary  
Juno mission  
lunar core  
planets  
stellar cores

### planetary craters

DEF Collective term for craters on any of the planetary surfaces.  
GS craters  
. **planetary craters**  
. . Mars craters  
RT Earth (planet)  
impact damage  
Mars (planet)  
Mars surface  
Mercury (planet)  
Mercury surface  
meteorite craters  
planetary geology  
planets  
Venus (planet)  
Venus surface

### planetary crusts

DEF The outermost layers of planets. The planetary crusts are on top of the mantle and are modified by various processes of weathering, sedimentation, metamorphosis, volcanism, and bombardment by meteorites.  
GS crusts  
. **planetary crusts**  
. . Earth crust  
RT lunar crust  
planetary geology  
planetary mantles

### planetary cryospheres

(added June 1996)  
RT ∞ cryospheres  
ice environments  
Mars (planet)  
permafrost  
planetary meteorology  
polar caps

### planetary entry

USE **atmospheric entry**

### planetary environments

SN (EXCLUDES EARTH)  
GS environments  
. extraterrestrial environments  
. . **planetary environments**  
. . . Mars environment  
. . . . Mars atmosphere  
. . . planetary atmospheres  
. . . . helium hydrogen atmospheres  
. . . . Jupiter atmosphere  
. . . . Mars atmosphere  
. . . . Mercury atmosphere  
. . . . Neptune atmosphere  
. . . . planetary ionospheres  
. . . . Pluto atmosphere  
. . . . Saturn atmosphere  
. . . . Uranus atmosphere  
. . . . Venus atmosphere  
. . . . Venus clouds  
. . . planetary magnetospheres  
. . . planetary magnetotails

RT aerospace environments  
bioastronautics  
∞ cryospheres  
exobiology  
life support systems  
long duration space flight  
lunar environment  
planets  
protoplanets  
terraforming  
terrestrial planets  
thermal environments

### planetary evolution

UF *planet origins*  
GS evolution (development)  
. **planetary evolution**  
RT cosmology  
Juno mission  
planetary geology  
protoplanetary disks  
protoplanets  
solar nebula  
solar system evolution  
stellar evolution

### planetary exploration

USE **space exploration**

### planetary explorer

USE **outer planets explorers**

### planetary geology

DEF Study or science of a planet, its history, and its life as recorded in the rocks. Includes the study of the surface features, the geometry of rock formations, weathering and erosion, and sedimentation.  
GS geology  
. **planetary geology**  
. . Mars volcanoes  
RT Earth analogs  
lunar geology  
Mars Express  
Mars Pathfinder  
MESSENGER (spacecraft)  
planetary craters  
planetary crusts  
planetary evolution  
planetary structure  
planetary surfaces  
planetology  
planets  
remote sensing  
solar system  
space exploration

### planetary gravitation

GS gravitation  
. **planetary gravitation**  
RT escape velocity  
lunar gravitation

### planetary ionospheres

SN (EXCLUDES EARTH IONOSPHERE)  
GS environments  
. extraterrestrial environments  
. . planetary environments  
. . . planetary atmospheres  
. . . . **planetary ionospheres**  
RT ∞ atmospheres  
∞ ionospheres  
Jupiter atmosphere  
magnetosphere-ionosphere coupling  
Mars atmosphere  
Neptune atmosphere  
Saturn atmosphere  
Uranus atmosphere  
Venus atmosphere

### planetary landing

SN (EXCLUDES LANDING ON THE PLANET EARTH)  
GS landing  
. spacecraft landing  
. . **planetary landing**  
. . . Mars landing  
RT crash landing  
glide landings  
hard landing  
horizontal spacecraft landing

interplanetary flight  
lunar landing  
orbital mechanics  
roving vehicles  
soft landing  
water landing

### planetary limb

DEF In astronomy, the circular outer edge of a planet.  
GS **planetary limb**  
. Earth limb  
RT ∞ limbs  
lunar limb  
solar limb

### planetary magnetic fields

GS magnetic fields  
. **planetary magnetic fields**  
RT geomagnetic tail  
geomagnetism  
Juno mission  
MESSENGER (spacecraft)  
planetary magnetospheres  
planetary magnetotails  
polar cusps  
solar planetary interactions

### planetary magnetospheres

SN (EXCLUDES EARTH MAGNETOSPHERE)  
GS environments  
. extraterrestrial environments  
. . planetary environments  
. . . **planetary magnetospheres**  
. . . . planetary magnetotails  
RT Earth magnetosphere  
∞ magnetospheres  
planetary magnetic fields  
solar planetary interactions

### planetary magnetotails

(added March 1990)  
SN (EXCLUDES EARTH'S MAGNETOTAIL; FOR EARTH USE 'GEOMAGNETIC TAIL')  
DEF The portion of the magnetosphere extending from a planet in the direction away from the sun for a variable distance of the order of 1,000 planet radii.  
GS environments  
. extraterrestrial environments  
. . planetary environments  
. . . planetary magnetospheres  
. . . . **planetary magnetotails**  
RT exosphere  
geomagnetic tail  
magnetopause  
∞ magnetotails  
planetary magnetic fields  
solar planetary interactions  
solar wind

### planetary mantles

GS **planetary mantles**  
. Earth mantle  
RT core-mantle boundary  
crusts  
lithosphere  
lunar mantle  
planetary crusts

### planetary mapping

GS mapping  
. **planetary mapping**  
RT astrography  
ground penetrating radar  
Heat Capacity Mapping Mission  
Mars Reconnaissance Orbiter  
thermal mapping

### planetary mass

GS mass  
. **planetary mass**  
RT protoplanets

### planetary meteorology

GS meteorology  
. **planetary meteorology**  
RT atmospheric circulation  
atmospheric physics  
Jupiter atmosphere  
Mars atmosphere

Mercury atmosphere  
planetary atmospheres  
planetary cryospheres  
planetology  
planets  
Venus atmosphere

*planetary motion*

USE **solar orbits**

**planetary nebulae**

GS celestial bodies  
. nebulae  
. . **planetary nebulae**  
RT Orion nebula

*planetary oceans*

(added June 2001)

USE **extraterrestrial oceans**

**planetary orbits**

GS orbits  
. **planetary orbits**  
RT Amor asteroid  
Apollo asteroids  
Charon  
circular orbits  
Earth orbits  
elliptical orbits  
equatorial orbits  
hypothetical planets  
interplanetary trajectories  
orbital resonances (celestial mechanics)  
parking orbits  
polar orbits  
retrograde orbits  
satellite orbits  
spacecraft orbits  
swingby technique  
transfer orbits  
twenty-four hour orbits  
Viking orbiter spacecraft

**planetary protection**

(added August 2001)

DEF Technological and legal measures taken to prevent biological cross-contamination between Earth and other planets as a result of solar system exploration missions. Also includes safeguards imposed on the handling, distribution, and analysis of material samples returned to Earth.

GS protection  
. **planetary protection**  
. . planetary quarantine  
RT contamination  
decontamination  
environment protection  
exobiology  
extraterrestrial life  
Mars sample return missions  
space law  
spacecraft sterilization

**planetary quakes**

RT earthquakes  
geodynamics  
moonquakes  
seismic waves  
shock waves

**planetary quarantine**

GS protection  
. planetary protection  
. . **planetary quarantine**  
RT spacecraft sterilization

**planetary radiation**

SN (EXCLUDES TERRESTRIAL RADIATION)  
GS electromagnetic radiation  
. **planetary radiation**  
extraterrestrial radiation  
. **planetary radiation**  
RT albedo  
decimeter waves  
infrared radiation  
light (visible radiation)  
∞ radiation  
radio waves

Saturn atmosphere  
terrestrial radiation  
thermal radiation  
VLF emission recorders

**planetary rings**

GS celestial bodies  
. **planetary rings**  
. . Jupiter rings  
. . Saturn rings  
. . Uranus rings  
RT dusty plasmas  
moonlets  
planetary atmospheres  
planets  
∞ rings

**planetary rotation**

GS gyration  
. rotation  
. . **planetary rotation**  
RT astrophysics  
planetology  
rotating bodies  
stellar rotation

*planetary satellites*

USE **natural satellites**

*planetary space flight*

USE **interplanetary flight**

*planetary spacecraft*

USE **interplanetary spacecraft**

**planetary structure**

RT asthenosphere  
chemical composition  
Earth planetary structure  
GRAIL mission  
Juno mission  
Jupiter rings  
lunar mantle  
planetary geology  
planetology  
Uranus rings

**planetary surfaces**

GS **planetary surfaces**  
. Mars surface  
. Mercury surface  
. Venus surface  
RT Earth surface  
extraterrestrial oceans  
Jupiter red spot  
Mars roving vehicles  
Marsokhod Mars roving vehicles  
planetary geology  
roving vehicles  
Saturn rings  
surface properties  
∞ surfaces  
topography

**planetary systems**

DEF Systems consisting of a star and the planets and other objects in orbit around it.

GS **planetary systems**  
. solar system  
RT extrasolar planets  
Kepler mission  
orbital resonances (celestial mechanics)  
planet detection  
solar system evolution  
∞ systems

**planetary temperature**

GS temperature  
. **planetary temperature**  
RT atmospheric temperature  
Saturn rings

**planetary waves**

DEF Waves on uniform currents in two-dimensional nondivergent fluid systems rotating with varying angular speeds about the local vertical (beta plane). These waves represent a special case of barotropic disturbance, conserving absolute vorticity. As applied to atmospheric

flow, the planetary waves takes into account the variability of the Coriolis parameter while assuming the motion to be two-dimensional. Used for long waves (meteorology) and Rossby waves.

UF *long waves (meteorology)*  
*Rossby waves*  
GS barotropism  
. **planetary waves**  
internal waves  
. **planetary waves**  
tropospheric waves  
. **planetary waves**  
RT atmospheric circulation  
barotropic flow  
Coriolis effect  
fluid flow  
gravity waves  
Kelvin waves  
Rossby regimes  
rotating fluids  
rotating liquids  
vortices  
∞ waves  
zonal flow (meteorology)

*Planet-B spacecraft*

(added August 1998)

USE **Nozomi Mars Orbiter**

*planetesimals*

USE **protoplanets**

**planetocentric coordinates**

GS coordinates  
. **planetocentric coordinates**  
. . geocentric coordinates  
RT astronomical coordinates  
celestial reference systems  
spherical coordinates

**planetology**

RT Jupiter rings  
planetary geology  
planetary meteorology  
planetary rotation  
planetary structure  
Saturn rings  
terrestrial planets  
trans-Neptunian objects

**planets**

DEF Celestial bodies of the solar system, revolving around the sun in nearly circular orbits, or similar bodies revolving around stars. The larger of such bodies are sometimes called principal planets to distinguish them from asteroids, planetoids, or minor planets, which are comparatively small. The larger planets are accompanied by satellites such as the moon. Inferior planets have orbits smaller than that of the Earth; superior planets have orbits larger than that of the Earth. The four planets nearest the sun are called inner planets; the others, outer planets. The four largest planets are called major planets. The four planets commonly used for celestial observations are called navigational planets. The word planet is of Greek origin, meaning, literally, wanderer, applied because the planets appear to move relative to the stars.

GS celestial bodies  
. **planets**  
. . extrasolar planets  
. . gas giant planets  
. . . Jupiter (planet)  
. . . Neptune (planet)  
. . . Saturn (planet)  
. . . Uranus (planet)  
. . terrestrial planets  
. . . Earth (planet)  
. . . Mars (planet)  
. . . Mercury (planet)  
. . . Venus (planet)  
. . hypothetical planets  
RT celestial mechanics  
Chiron  
ecliptic  
Jupiter red spot  
natural satellites  
planet ephemerides  
planetary cores

## planforms

planetary craters  
planetary environments  
planetary geology  
planetary meteorology  
planetary rings  
Pluto (planet)  
protoplanetary disks  
protoplanets  
Saturn rings  
solar system  
solar system evolution  
sun

### planforms

GS **planforms**  
. caret wings  
. rectangular planforms  
. . . rectangular panels  
. . . rectangular plates  
. . . rectangular wings  
. sweptback tail surfaces  
. trapezoidal tail surfaces  
. wing planforms  
. . . channel wings  
. . . infinite span wings  
. . . swept forward wings  
. . . . trapezoidal wings  
. . . sweptback wings  
. . . . arrow wings  
. . . . delta wings  
. . . . trapezoidal wings  
. . . . variable sweep wings  
RT ∞ bodies  
∞ cross sections  
geometry  
∞ profiles  
shapes  
∞ surface geometry

### planigraphy

USE **tomography**

### planing

SN (EXCLUDES MOTION INVOLVING DYNAMIC SUPPORTING FORCES)  
GS cutting  
. **planing**  
RT grinding (material removal)  
machining  
metal cutting  
milling (machining)  
slicing  
smoothing

### planispheres

GS maps  
. astronomical maps  
. . . **planispheres**  
RT astronomical coordinates  
celestial sphere  
constellations  
polar coordinates

### plankton

DEF The aggregate of passively floating or drifting plant and animal organisms which provide the major source of sustenance for animal life in the aquatic ecosystem. Used for plankton bloom.

UF *plankton bloom*  
GS **plankton**  
. phytoplankton  
. zooplankton  
RT algae  
animals  
plants (botany)  
red tide  
thermal pollution

### plankton bloom

USE **plankton**

### planning

GS **planning**  
. airport planning  
. management planning  
. . . production planning  
. . . project planning  
. . . mission planning  
. . . regional planning

. . . urban planning  
. task planning (robotics)  
. trajectory planning  
RT budgeting  
critical path method  
Delphi method (forecasting)  
∞ design  
forecasting  
∞ missions  
optimization  
pattern method (forecasting)  
probe method (forecasting)  
production engineering  
profile method (forecasting)  
progress  
sequencing  
slicing  
Starsite program  
training analysis  
urban development

### planotrons

UF *amplitrons (trademark)*  
GS amplifiers  
. microwave amplifiers  
. . . **planotrons**  
electron tubes  
. vacuum tubes  
. . . microwave tubes  
. . . . **planotrons**  
microwave equipment  
. microwave amplifiers  
. . . **planotrons**  
. . . microwave tubes  
. . . . **planotrons**  
RT camera tubes  
electric arcs  
magnetrons

### ∞ plans

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT drawings  
flight plans  
layouts  
mission planning  
payload integration plan  
urban development

### plant design

SN (EXCLUDES BIOLOGICAL PLANTS)  
DEF Encompasses all design consideration of physical plants, i.e., airports, industrial plants, test facilities, etc. Structural is just one aspect of this design. SN (excludes biological plants)  
RT architecture  
∞ design  
structural design

### plant diseases

UF *diseased vegetation*  
GS **plant diseases**  
. blight  
RT agriculture  
crop growth  
crop identification  
crop vigor  
diseases  
fungi  
plant physiology  
plant stress  
plants (botany)  
rust fungi

### plant growth regulators

(added August 2004)  
DEF A substance which affects the growth and other functions of a plant. These include the hormones auxins, gibberellins, and cytokinins, which are produced naturally in plants, as well as ethylene.  
GS **plant growth regulators**  
. abscisic acid  
. auxins  
RT ethylene  
indoleacetic acids  
plant physiology

plants (botany)

### plant physiology

(added August 2004)  
DEF Physiological functions characteristic of plants.  
GS physiology  
. **plant physiology**  
RT abscisic acid  
auxins  
germination  
gravitropism  
leaves  
photosynthesis  
phototropism  
phytochrome  
plant diseases  
plant growth regulators  
plant roots  
plant stress  
plants (botany)  
respiration  
seedlings (botany)  
transpiration  
vegetation growth

### plant roots

RT auxins  
bulbs  
plant physiology  
plants (botany)  
∞ roots  
seedlings (botany)  
vegetation growth

### plant stress

DEF Stimulus or a series of stimuli of such magnitude as to disrupt the growth and/or survival of plants.  
GS stress (biology)  
. **plant stress**  
RT aerial photography  
agriculture  
crop growth  
crop vigor  
Earth Resources Program  
plant diseases  
plant physiology  
remote sensing  
soil moisture  
spectral reflectance  
vegetation growth

### plantar tissues

GS tissues (biology)  
. **plantar tissues**

### planting

RT agriculture  
∞ crops  
cultivation  
farm crops  
farmlands  
fertilizers  
plants (botany)  
plowing  
plows  
seeds  
silviculture  
soils  
tractors  
vegetables

### plants (botany)

UF *flora*  
GS **plants (botany)**  
. alfalfa  
. algae  
. . . blue green algae  
. . . anabaena  
. . . Microcystis  
. . . Nostoc  
. . . Chlorella  
. . . Dunaliella  
. . . porphyra  
. . . scenedesmus  
. . . aquatic plants  
. . . phytoplankton  
. barley  
. brush (botany)

. . chaparral  
 . Bryophytes  
 . corn  
 . cotton  
 . fungi  
 . . Aspergillus  
 . . Coccomyces  
 . . gibberellins  
 . . neurospora  
 . . rhizopus  
 . . rust fungi  
 . . saccharomyces  
 . . yeast  
 . grasses  
 . . hay  
 . . reeds (plants)  
 . . sea grasses  
 . . sorghum  
 . guayule  
 . leguminous plants  
 . . soybeans  
 . lichens  
 . millet  
 . oats  
 . photophilic plants  
 . phreatophytes  
 . potatoes  
 . rice  
 . saprophytes  
 . spinach  
 . sugar beets  
 . sugar cane  
 . sunflowers  
 . thermophilic plants  
 . . blue green algae  
 . . . anabaena  
 . . . Microcystis  
 . . . Nostoc  
 . tobacco  
 . tradescantia  
 . tragacanth  
 . trees (plants)  
 . . citrus trees  
 . . conifers  
 . . deciduous trees  
 . genetically modified plants  
 . seedlings (botany)  
 RT abscisic acid  
 agriculture  
 angiosperms  
 animals  
 auxins  
 biochemical oxygen demand  
 biogeochemistry  
 biomass  
 blight  
 botany  
 canopies (vegetation)  
 carbon cycle  
 chlorophylls  
 cortexes (botany)  
 crop growth  
 crop vigor  
 defoliants  
 defoliation  
 Earth resources  
 environments  
 farm crops  
 foliage  
 food chain  
 forests  
 frost damage  
 geobotany  
 geotropism  
 gravitropism  
 greenhouses  
 halophiles  
 herbicides  
 heterotrophs  
 hydroponics  
 infestation  
 lacunas  
 leaves  
 microorganisms  
 microspores  
 mitra  
 orchards  
 organisms  
 petals

phototropism  
 phytochrome  
 phytotrons  
 plankton  
 plant diseases  
 plant growth regulators  
 plant physiology  
 plant roots  
 planting  
 plastids  
 plowing  
 pollen  
 rain forests  
 seeds  
 spores  
 stems  
 utricles  
 vegetation  
 viability  
 vineyards  
 wood

plants (industries)  
 USE **industrial plants**

**plasma acceleration**  
 UF *magnetohydrodynamic acceleration*  
 GS rates (per time)  
 . acceleration (physics)  
 . . **plasma acceleration**  
 RT ∞ acceleration  
 magnetic nozzles  
 particle acceleration  
 plasmas (physics)  
 wave propagation  
 wave-particle interactions

**plasma accelerators**  
 GS **plasma accelerators**  
 . alpha plasma devices  
 . coaxial plasma accelerators  
 . Cyclops plasma accelerator  
 RT ∞ accelerators  
 electromagnetic acceleration  
 ion injection  
 magnetic annular arc  
 magnetohydrodynamic generators  
 magnetoplasma dynamic thrusters  
 plasmas (physics)

**plasma antennas**  
 DEF An air plasma made by ionizing the atmosphere which acts as the conducting element of an RF antenna.  
 GS antennas  
 . **plasma antennas**  
 RT antenna design  
 antenna radiation patterns  
 plasma cylinders  
 satellite communication  
 spacecraft communication

**plasma arc cutting**  
 DEF Use of plasma torches for cutting hard materials at extremely high temperatures.  
 RT metal cutting  
 metal working  
 plasma arc welding  
 plasma torches  
 plasmas (physics)

*plasma arc spraying*  
 USE **arc spraying**

**plasma arc welding**  
 GS welding  
 . fusion welding  
 . . electric welding  
 . . . arc welding  
 . . . . **plasma arc welding**  
 RT plasma arc cutting  
 plasma torches  
 plasmas (physics)

*plasma arcs*  
 USE **plasma jets**

**plasma bubbles**  
 DEF Pockets of very low electron density in the equatorial F region of the ionosphere in

which the plasma density is lower than the ambient density.  
 RT F region  
 plasma density

**plasma chemistry**  
 RT ∞ chemistry  
 nuclear chemistry  
 plasmas (physics)

*plasma chromatography*  
 USE **ion mobility spectroscopy**

**plasma clouds**  
 DEF Specifically, a mass of ionized gas flowing out of the sun.  
 GS particles  
 . charged particles  
 . . **plasma clouds**  
 . . . magnetic clouds  
 RT chemical clouds  
 ∞ clouds  
 cosmic plasma  
 dusty plasmas  
 Earth magnetosphere  
 geomagnetic hollow  
 hydrogen clouds  
 interplanetary medium  
 ion sheaths  
 plasmopause  
 plasmas (physics)

**plasma composition**  
 GS composition (property)  
 . **plasma composition**  
 RT atom concentration  
 dusty plasmas  
 gas composition  
 ion motion  
 ionospheric composition  
 nonequilibrium plasmas  
 nonuniform plasmas  
 plasmas (physics)  
 Thomas-Fermi model  
 uranium plasmas

**plasma compression**  
 DEF Decrease in volume and consequent increase in density of a plasma usually by the application of an intense magnetic field.  
 GS compressing  
 . **plasma compression**  
 RT controlled fusion  
 dense plasmas  
 inertial fusion (reactor)  
 magnetic effects  
 magnetic field configurations  
 pinch effect  
 plasma focus  
 plasma pressure  
 plasmas (physics)  
 strongly coupled plasmas  
 theta pinch  
 tokamak devices  
 zeta pinch

**plasma conductivity**  
 GS electrical properties  
 . electrical resistivity  
 . . **plasma conductivity**  
 transport properties  
 . electrical resistivity  
 . . **plasma conductivity**  
 RT collisional plasmas  
 ∞ conductivity  
 ionospheric conductivity  
 magnetohydrodynamic stability  
 plasmas (physics)  
 strongly coupled plasmas

*plasma confinement*  
 USE **plasma control**

**plasma control**  
 UF *plasma confinement*  
 RT ballooning modes  
 beta factor  
 bumpy toruses  
 confinement  
 ∞ control



## plasma cooling

crossed field guns  
crossed fields  
divertors (fusion reactors)  
electron-ion recombination  
elliptical plasmas  
helical inducers  
helical windings  
heliotrons  
limiters (fusion reactors)  
magnetic annular arc  
magnetic compression  
magnetic field configurations  
magnetic mirrors  
magnetically trapped particles  
mirror fusion  
pinch effect  
plasmas (physics)  
reverse field pinch  
rigid rotors (plasma physics)  
screw pinch  
spheromaks  
stellarators  
tandem mirrors  
thermal barriers (plasma control)  
tokamak devices  
toroidal plasmas  
transformers  
TRAP program  
trapped magnetic fields  
zeta pinch

### plasma cooling

DEF Temperature control of plasmas in controlled fusion operations.  
GS cooling  
. **plasma cooling**  
RT controlled fusion  
magnetohydrodynamic stability  
plasmas (physics)  
temperature control

### plasma core reactors

DEF Nuclear reactors utilizing fissionable plasmas (such as uranium fluoride) for the fuel.  
GS nuclear reactors  
. **plasma core reactors**  
RT critical mass  
nuclear power plants  
nuclear research  
plasmas (physics)  
radioactive wastes  
reactor cores  
 $\infty$  reactors  
reflectors  
waste disposal

### plasma currents

DEF Electric currents induced in plasmas by injection of fast ion beams or some other means.  
GS electric current  
. **plasma currents**  
RT beam currents  
controlled fusion  
eddy currents  
electric discharges  
electrical resistivity  
field aligned currents  
high current  
ionospheric currents  
line current  
low currents  
magnetohydrodynamics  
plasma-particle interactions  
plasmas (physics)  
ring currents  
spheromaks  
toroidal plasmas

### plasma cylinders

GS **plasma cylinders**  
. cylindrical plasmas  
RT  $\infty$  cylinders  
cylindrical bodies  
cylindrical shells  
plasma antennas  
plasmaguides

plasmas (physics)

### plasma decay

GS decay  
. **plasma decay**  
RT afterglows  
electromagnetic wave transmission  
helium afterglow  
magnetohydrodynamic stability  
plasmas (physics)

### plasma density

GS density (number/volume)  
. particle density (concentration)  
. . **plasma density**  
RT atmospheric density  
atom concentration  
cavitons  
collisional plasmas  
electron density (concentration)  
electron-hole drops  
ion density (concentration)  
magnetoplasmadynamics  
magnetospheric electron density  
magnetospheric ion density  
magnetospheric proton density  
plasma bubbles  
plasma drift  
plasma pressure  
plasmas (physics)  
proton density (concentration)  
space density  
space plasmas  
strongly coupled plasmas

### plasma diagnostics

RT Fabry-Perot interferometers  
laser-induced breakdown spectroscopy  
microwave interferometers  
OPEN Project  
plasmas (physics)  
resonance probes  
space plasmas

### plasma diffusion

UF *plasma dispersion*  
GS diffusion  
. **plasma diffusion**  
RT ambipolar diffusion  
colloidal generators  
diffusion waves  
electron diffusion  
gaseous self-diffusion  
ion motion  
ionic diffusion  
plasmas (physics)

### plasma diodes

GS electronic equipment  
. diodes  
. . **plasma diodes**  
RT cesium diodes  
plasmas (physics)

### plasma discharges

USE **plasma jets**

### plasma dispersion

USE **plasma diffusion**

### plasma display devices

DEF Digital matrix flat panel devices in which small gas discharge plasma cells are used as light emitting sources.  
GS display devices  
. **plasma display devices**  
RT  $\infty$  devices  
gas ionization  
glow discharges  
light sources  
plasmas (physics)

### plasma drift

DEF Movement in the ionosphere of ion and plasma concentration by electric field variations in the upper atmosphere.  
RT magnetohydrodynamic stability  
plasma density  
plasma waves

plasmas (physics)

### plasma dynamics

UF *snowplow effect*  
RT  $\infty$  dynamics  
hydrodynamic equations  
Langmuir turbulence  
magnetohydrodynamics  
meshfree methods  
plasmas (physics)

### plasma electrodes

GS electrodes  
. **plasma electrodes**  
RT hot-wire flowmeters  
plasmaguides  
plasmatrons  
zeta pinch

### plasma engines

DEF Reaction engines using magnetically accelerated plasma as a propellant. Plasma engines are types of electrical engines.  
UF *electromagnetic rocket engines*  
GS engines  
. rocket engines  
. . electric rocket engines  
. . . **plasma engines**  
. . . . magnetoplasmadynamic thrusters  
. . . . pulsed inductive thrusters  
. . . . pulsed plasma thrusters  
. . . . two stage plasma engines  
. . . . VASIMR (propulsion system)  
RT arc jet engines  
coaxial plasma accelerators  
electrothermal engines  
Hall thrusters  
high temperature propellants  
ion engines  
magnetic nozzles  
mercury ion engines  
plasma power sources  
plasmas (physics)  
pulsed jet engines  
resistojet engines  
RIT engines

### plasma equilibrium

DEF Condition of plasma in which the constituent particles or fluid elements are unaccelerated or collectively at rest in steady flow.  
RT ballooning modes  
beta factor  
confinement  
electron-hole drops  
 $\infty$  equilibrium  
equilibrium flow  
magnetic mirrors  
magnetohydrodynamic stability  
plasmas (physics)  
strongly coupled plasmas

### plasma etching

DEF Removal of material by use of a focused plasma beam.  
GS etching  
. **plasma etching**  
RT plasmas (physics)  
sputtering

### plasma flow

USE **magnetohydrodynamic flow**

### plasma flux measurement

RT interferometry  
magnetohydrodynamic flow  
microwave plasma probes  
plasmas (physics)  
rotating plasmas  
speckle interferometry

### plasma focus

DEF A highly compressed plasma.  
GS foci  
. **plasma focus**  
particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)

- . . . . dense plasmas
- . . . . . **plasma focus**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . dense plasmas
- . . . . . **plasma focus**
- RT nuclear fusion
- plasma compression
- strongly coupled plasmas
- zeta pinch
  
- plasma frequencies**
- GS frequencies
- . **plasma frequencies**
- RT electron density (concentration)
- electrostatic probes
- free electrons
- plasmas (physics)
- plasmions
  
- plasma generation*
- USE **plasma generators**
  
- plasma generators**
- SN (EXCLUDES MAGNETOHYDRODYNAMIC OR THERMONUCLEAR GENERATORS OF ELECTRIC POWER)
- DEF Machines, such as electric arc chambers, that will generate very high heat fluxes to convert neutral gases into plasmas. Devices which use the interaction of plasmas and electrical field to generate currents. Used for plasma generation.
- UF *plasma generation*
- GS **plasma generators**
- . plasma guns
- . plasmatrons
- . . duoplasmatrons
- . Scylla
- . tokamak devices
- . . Joint European Torus
- RT arc chambers
- arc generators
- closed cycles
- colloidal generators
- electric arcs
- exploding wires
- ∞ generators
- Hall generators
- high temperature research
- ion injection
- ion sources
- magnetohydrodynamic generators
- Penning discharge
- plasmas (physics)
- pulse generators
- thermal plasmas
- thermonuclear power generation
- wind tunnel drives
  
- plasma guns**
- GS plasma generators
- . **plasma guns**
- RT coaxial plasma accelerators
- crossed field guns
- electron guns
- ∞ guns
- magnetic lenses
- plasmas (physics)
- plasmatrons
  
- plasma heating**
- GS heating
- . **plasma heating**
- . . electron cyclotron heating
- RT arc heating
- beam injection
- beta factor
- bumpy toruses
- electron cyclotron resonance
- energy transfer
- gas heating
- induction heating
- ionospheric heating
- kinetic heating
- Langmuir turbulence
- magnetic pumping
- magnetohydrodynamic shear heating
- plasma temperature
  
- plasmas (physics)
- radio frequency heating
- relativistic electron beams
- shock heating
- VASIMR (propulsion system)
  
- plasma instability*
- USE **magnetohydrodynamic stability**
  
- plasma interaction experiment**
- DEF A NASA Lewis experiment, the first of which was launched piggyback with Landsat 3 in 1978 to study the charged particle space plasma environment and its effect on spacecraft surfaces operating at high voltages. The experiment lasted several hours as planned. The second was launched piggyback with Iras in 1983. Used for PIX.
- UF *PIX*
- GS payloads
- . Space Shuttle payloads
- . . **plasma interaction experiment**
- spaceborne experiments
- . **plasma interaction experiment**
- RT ∞ interactions
- Landsat 3
- plasmas (physics)
- space density
- SPHINX
  
- plasma interactions**
- GS **plasma interactions**
- . plasma-electromagnetic interaction
- . . laser plasma interactions
- . . plasma-particle interactions
- RT ∞ interactions
- plasmas (physics)
- solar planetary interactions
- space plasmas
- wave interaction
- wave-particle interactions
- Weibel instability
  
- plasma jet synthesis**
- RT chemical reactions
- plasmas (physics)
- ∞ synthesis
  
- plasma jet wind tunnels**
- UF *hydrodynamic tunnels*
- GS test facilities
- . wind tunnels
- . . hypersonic wind tunnels
- . . . **plasma jet wind tunnels**
- . . hypervelocity wind tunnels
- . . . **plasma jet wind tunnels**
- RT plasmas (physics)
  
- plasma jets**
- UF *plasma arcs*
- plasma discharges*
- GS particles
- . charged particles
- . . **plasma jets**
- . . . radio jets (astronomy)
- RT ∞ arcs
- crossed field guns
- drop transfer
- electron beams
- electron bombardment
- fluid jets
- ion injection
- ∞ jets
- low density wind tunnels
- magnetic lenses
- plasma torches
- plasmas (physics)
- plasmatrons
- pulse diffraction
- relativistic electron beams
- relativistic plasmas
- toroidal discharge
- vapor jets
  
- plasma layers**
- GS particles
- . charged particles
- . . **plasma layers**
- . . . plasma sheaths
- RT atmospheric stratification
  
- ∞ layers
- plasmas (physics)
- space plasmas
- ∞ transition layers
  
- plasma lifetime**
- GS life (durability)
- . **plasma lifetime**
- RT magnetohydrodynamic stability
- plasmas (physics)
  
- plasma loss**
- RT limiters (fusion reactors)
- losses
- magnetohydrodynamic stability
- plasmas (physics)
  
- plasma oscillations**
- UF *ion oscillation*
- plasma perturbation*
- GS oscillations
- . **plasma oscillations**
- electron oscillations
- ion acoustic waves
- Langmuir turbulence
- nonuniform plasmas
- plasmopause
- plasmas (physics)
- plasmions
  
- plasma perturbation*
- USE **plasma oscillations**
  
- plasma physics**
- DEF The study of the nature and properties of highly ionized gases (comprised of ions and free electrons).
- UF *plasma theory*
- GS rigid rotors (plasma physics)
- . **plasma physics**
- RT alpha plasma devices
- BBGKY hierarchy
- beta factor
- boundary layer plasmas
- cavitons
- controlled fusion
- electron runaway (plasma physics)
- grand unified theory
- Hall accelerators
- instantons
- Larmor radius
- Liouville equations
- magnetic field configurations
- magnetohydrodynamics
- magnetohydrostatics
- negative ions
- neutral sheets
- OPEN Project
- ∞ physics
- plasmopause
- plasmas (physics)
- radiation trapping
- ∞ science
- semiconductor plasmas
- space plasmas
- theoretical physics
- thermodynamics
- tokamak devices
- unified field theory
- uranium plasmas
  
- plasma pinch**
- GS pinch effect
- . **plasma pinch**
- . . screw pinch
- . . theta pinch
- . . zeta pinch
- RT magnetohydrodynamic stability
- plasmas (physics)
- Q devices
  
- plasma potentials**
- GS potential energy
- . **plasma potentials**
- RT Debye-Huckel theory
- magnetohydrodynamic stability
- nonequilibrium plasmas
- plasmas (physics)

## plasma power sources

∞ potential

### plasma power sources

- RT electric propulsion
- ∞ energy sources
  - plasma engines
  - plasmas (physics)
- ∞ power supplies
  - thermionic converters

### plasma pressure

- GS pressure
  - . **plasma pressure**
- RT plasma compression
- plasma density
- plasmas (physics)

### plasma probes

- GS measuring instruments
  - . **plasma probes**
  - . . . electrostatic probes
- RT ion sheaths
- plasmaguides
- plasmas (physics)
- radio frequency impedance probes

### plasma propulsion

- GS propulsion
  - . electric propulsion
  - . . . **plasma propulsion**
  - . . low thrust propulsion
  - . . . **plasma propulsion**
  - . spacecraft propulsion
  - . . . **plasma propulsion**
- RT duoplasmatrons
- electromagnetic propulsion
- electrostatic propulsion
- fusion propulsion
- gaseous fission reactors
- ion propulsion
- magnetic annular arc
- magnetic nozzles
- magnetic sails
- magnetohydrodynamics
- magnetoplasmadynamic thrusters
- magnetoplasmadynamics
- nuclear electric propulsion
- plasmas (physics)
- plasmatrons
- pulsed inductive thrusters
- pulsed plasma thrusters
- VASIMR (propulsion system)

### plasma pumping

- DEF Application of radiation of appropriate frequencies to plasma, to increase the population of atoms or molecules in the higher energy states.
- RT gas injection
- molecular pumps
- plasmas (physics)
- ∞ pumping

### plasma radiation

- RT electron radiation
- fluorescence
- glow discharges
- ion cyclotron radiation
- laser induced fluorescence
- luminescence
- nonequilibrium plasmas
- optical resonance
- phosphorescence
- plasmas (physics)
- polarized radiation
- ∞ radiation
- relativistic plasmas

### *plasma renin activity*

- USE **immunoassay**

### plasma resonance

- GS resonance
  - . **plasma resonance**
- RT cavitons
- cyclotron resonance
- electromagnetic interactions
- electron cyclotron resonance
- plasmas (physics)
- resonance lines

resonance probes

### *plasma rings*

- USE **toroidal plasmas**

### plasma sheaths

DEF The boundary layers of charged particles between plasmas and their surrounding walls, electrodes, or other plasmas. Envelopes of ionized gases that surround bodies moving through an atmosphere at hypersonic velocities.

- GS particles
  - . charged particles
  - . . plasma layers
  - . . . **plasma sheaths**
  - sheaths
  - . **plasma sheaths**
- RT blackout (propagation)
- boundary layer plasmas
- ion sheaths
- magnetohydrodynamic shear heating
- magnetosheath
- metallic plasmas
- missiles
- nonequilibrium plasmas
- plasmas (physics)
- reentry communication
- reentry effects
- reentry physics
- system generated electromagnetic pulses
- uncontrolled reentry (spacecraft)

### plasma slabs

- GS particles
  - . charged particles
  - . . **plasma slabs**
- RT magnetohydrodynamic stability
- plasmas (physics)

### *plasma sound waves*

- USE **magnetohydrodynamic waves**
- plasma waves**

### plasma spectra

- GS spectra
  - . **plasma spectra**
- RT emission spectra
- energy spectra
- optical resonance
- plasmas (physics)
- radiation spectra

### plasma spraying

- GS spraying
  - . **plasma spraying**
- RT coating
- coatings
- flame spraying
- HVOF thermal spraying
- metal matrix composites
- plasmas (physics)
- sprayed coatings

### *plasma stability*

- USE **magnetohydrodynamic stability**

### plasma temperature

- GS temperature
  - . **plasma temperature**
- RT ion temperature
- magnetohydrodynamic stability
- plasma heating
- plasmas (physics)
- thermal plasmas

### *plasma theory*

- USE **plasma physics**

### plasma torches

DEF Burners which attain 50,000 degrees C temperatures by the use of plasma gas injected into an electric arc. Plasma torches are used for welding, spraying molten metal, and cutting hard rock or hard metals.

- GS torches
  - . **plasma torches**
- RT plasma arc cutting
- plasma arc welding
- plasma jets

plasmas (physics)

### plasma turbulence

- GS turbulence
  - . magnetohydrodynamic turbulence
  - . . **plasma turbulence**
  - . . . Langmuir turbulence
- RT magnetohydrodynamic flow
- magnetohydrodynamic simulation
- magnetohydrodynamic stability
- plasmas (physics)

### plasma waves

- UF *plasma sound waves*
- GS elastic waves
  - . magnetohydrodynamic waves
  - . . **plasma waves**
  - . . . electrostatic waves
- RT collisional plasmas
- diffusion waves
- electroacoustic waves
- electron plasma
- ion acoustic waves
- ion cyclotron radiation
- ionic waves
- Landau damping
- Langmuir turbulence
- magnetoacoustic waves
- magnetoelastic waves
- nonuniform plasmas
- plasma drift
- plasmas (physics)
- Polar/GGS spacecraft
- shock waves
- space plasmas
- wave packets
- wave-particle interactions

### plasmadynamic lasers

DEF Stimulated emission devices in which the lasing gas flow has been replaced with a lasing plasma flow of atoms or ions.

- GS stimulated emission devices
  - . lasers
  - . . **plasmadynamic lasers**
- RT coherent light
- gasdynamic lasers
- laser applications
- plasmas (physics)

### plasma-electromagnetic interaction

- GS electromagnetic interactions
  - . **plasma-electromagnetic interaction**
  - . . laser plasma interactions
  - plasma interactions
  - . **plasma-electromagnetic interaction**
  - . . laser plasma interactions
- RT electromagnetic coupling
- ∞ interactions
- plasmas (physics)
- space plasmas
- wave-particle interactions

### plasmaguides

- GS waveguides
  - . **plasmaguides**
- RT beam waveguides
- Earth-ionosphere waveguide
- electromagnetic wave transmission
- microwave plasma probes
- plasma cylinders
- plasma electrodes
- plasma probes
- plasmas (physics)
- wave propagation

### plasma-particle interactions

- GS particle interactions
  - . **plasma-particle interactions**
  - plasma interactions
  - . **plasma-particle interactions**
- RT beam injection
- beam plasma amplifiers
- charge exchange
- dusty plasmas
- electron phonon interactions
- electron plasma
- ∞ interactions

particle theory  
 plasma currents  
 plasmas (physics)  
 relativistic electron beams  
 relativistic plasmas  
 SPHINX  
 wave-particle interactions

**plasmopause**

SN (LIMITED TO EARTH'S ATMOSPHERE)  
 RT cosmic plasma  
 Earth magnetosphere  
 ionopause  
 plasma clouds  
 plasma oscillations  
 plasma physics  
 plasmas (physics)  
 solar wind

**plasmas (physics)**

SN (LIMITED TO COMPLETELY IONIZED MATTER; FOR PARTIALLY IONIZED GASES SEE IONIZED GASES)  
 DEF Electrically conductive gases comprised of neutral particles, ionized particles, and free electrons but which, taken as a whole, are electrically neutral. Plasmas are further characterized by relatively large intermolecular distances, large amounts of energy stored in the internal energy levels of the particles, and the presence of plasma sheaths at all boundaries of the plasma. Plasmas are sometimes referred to as a fourth state of matter. Used for electrostatic plasma, ionized plasma, magnetoionic plasma, magnetoplasmas, and plasmoids.

UF *electrostatic plasma*  
*ionized plasmas*  
*magnetoionic plasma*  
*magnetoplasmas*  
*plasmoids*

GS particles  
 . charged particles  
 . . energetic particles  
 . . . **plasmas (physics)**  
 . . . . argon plasma  
 . . . . beta particles  
 . . . . boundary layer plasmas  
 . . . . cold plasmas  
 . . . . collisional plasmas  
 . . . . . strongly coupled plasmas  
 . . . . . collisionless plasmas  
 . . . . . cosmic plasma  
 . . . . . cylindrical plasmas  
 . . . . . dense plasmas  
 . . . . . plasma focus  
 . . . . . strongly coupled plasmas  
 . . . . . electron plasma  
 . . . . . electron-positron plasmas  
 . . . . . elliptical plasmas  
 . . . . . helium plasma  
 . . . . . high temperature plasmas  
 . . . . . hydrogen plasma  
 . . . . . deuterium plasma  
 . . . . . laser plasmas  
 . . . . . metallic plasmas  
 . . . . . cesium plasma  
 . . . . . uranium plasmas  
 . . . . . microplasmas  
 . . . . . nitrogen plasma  
 . . . . . nonequilibrium plasmas  
 . . . . . nonuniform plasmas  
 . . . . . oxygen plasma  
 . . . . . rarefied plasmas  
 . . . . . relativistic plasmas  
 . . . . . rotating plasmas  
 . . . . . semiconductor plasmas  
 . . . . . space plasmas  
 . . . . . solar wind  
 . . . . . stellar winds  
 . . . . . dusty plasmas  
 . . . . . spherical plasmas  
 . . . . . thermal plasmas  
 . . . . . toroidal plasmas  
 . corpuscular radiation  
 . . energetic particles  
 . . . **plasmas (physics)**  
 . . . . argon plasma  
 . . . . beta particles  
 . . . . boundary layer plasmas  
 . . . . cold plasmas

. . . . collisional plasmas  
 . . . . . strongly coupled plasmas  
 . . . . . collisionless plasmas  
 . . . . . cosmic plasma  
 . . . . . cylindrical plasmas  
 . . . . . dense plasmas  
 . . . . . plasma focus  
 . . . . . strongly coupled plasmas  
 . . . . . electron plasma  
 . . . . . electron-positron plasmas  
 . . . . . elliptical plasmas  
 . . . . . helium plasma  
 . . . . . high temperature plasmas  
 . . . . . hydrogen plasma  
 . . . . . deuterium plasma  
 . . . . . laser plasmas  
 . . . . . metallic plasmas  
 . . . . . cesium plasma  
 . . . . . uranium plasmas  
 . . . . . microplasmas  
 . . . . . nitrogen plasma  
 . . . . . nonequilibrium plasmas  
 . . . . . nonuniform plasmas  
 . . . . . oxygen plasma  
 . . . . . rarefied plasmas  
 . . . . . relativistic plasmas  
 . . . . . rotating plasmas  
 . . . . . semiconductor plasmas  
 . . . . . space plasmas  
 . . . . . solar wind  
 . . . . . stellar winds  
 . . . . . dusty plasmas  
 . . . . . toroidal plasmas  
 . . . . . spherical plasmas  
 . . . . . thermal plasmas  
 . . . . . toroidal plasmas  
 RT alpha plasma devices  
 beam plasma amplifiers  
 blackout (propagation)  
 chemical elements  
 combustion physics  
 core flow  
 Cyclops plasma accelerator  
 Debye length  
 deuteron irradiation  
 deuterons  
 duoplasmatrons  
 electric arcs  
 electron energy  
 gases  
 high temperature fluids  
 ionized gases  
 ions  
 Kelvin-Helmholtz instability  
 Landau factor  
 laser fusion  
 laser plasma interactions  
 light ions  
 Liouville equations  
 low density research  
 magnetic compression  
 magnetohydrodynamic flow  
 magnetohydrodynamic stability  
 magnetohydrodynamics  
 magnetoionics  
 microwave plasma probes  
 neutral gases  
 ∞ Onsager phenomenological coefficient  
 physics  
 plasma acceleration  
 plasma accelerators  
 plasma arc cutting  
 plasma arc welding  
 plasma chemistry  
 plasma clouds  
 plasma composition  
 plasma compression  
 plasma conductivity  
 plasma control  
 plasma cooling  
 plasma core reactors  
 plasma currents  
 plasma cylinders  
 plasma decay  
 plasma density  
 plasma diagnostics  
 plasma diffusion  
 plasma diodes  
 plasma display devices  
 plasma drift

plasma dynamics  
 plasma engines  
 plasma equilibrium  
 plasma etching  
 plasma flux measurement  
 plasma frequencies  
 plasma generators  
 plasma guns  
 plasma heating  
 plasma interaction experiment  
 plasma interactions  
 plasma jet synthesis  
 plasma jet wind tunnels  
 plasma jets  
 plasma layers  
 plasma lifetime  
 plasma loss  
 plasma oscillations  
 plasma physics  
 plasma pinch  
 plasma potentials  
 plasma power sources  
 plasma pressure  
 plasma probes  
 plasma propulsion  
 plasma pumping  
 plasma radiation  
 plasma resonance  
 plasma sheaths  
 plasma slabs  
 plasma spectra  
 plasma spraying  
 plasma temperature  
 plasma torches  
 plasma turbulence  
 plasma waves  
 plasmadynamic lasers  
 plasma-electromagnetic interaction  
 plasmaguides  
 plasma-particle interactions  
 plasmopause  
 plasmasphere  
 plasmatrons  
 radiation belts  
 rarefied gas dynamics  
 Scylla  
 solar physics  
 space charge  
 SPHINX  
 stellar magnetic fields  
 tearing modes (plasmas)  
 thermal dissociation  
 thermodynamics  
 thermonuclear reactions  
 two stage plasma engines

*plasmas-in-space payload*  
 USE **AMPS (satellite payload)**

**plasmasphere**

DEF Envelope of highly ionized gases surrounding the Earth or another planet.  
 RT atmospheric ionization  
 chemosphere  
 Earth atmosphere  
 Earth magnetosphere  
 IMAGE satellite  
 OPEN Project  
 plasmas (physics)  
 upper atmosphere

**plasmatrons**

GS ion sources  
 . **plasmatrons**  
 . . duoplasmatrons  
 plasma generators  
 . **plasmatrons**  
 . . duoplasmatrons  
 RT plasma electrodes  
 plasma guns  
 plasma jets  
 plasma propulsion  
 plasmas (physics)

**plasmids**

(added February 2002)  
 DEF Self-replicating circular molecules of DNA that are found in a variety of bacterial, archaeal, fungal, algal and plant species.  
 RT cloning (biology)

## plasmolysis

- deoxyribonucleic acid
- gene therapy
- genetic engineering
- plasmoids*
- USE **plasmas (physics)**
- plasmolysis**
- RT cells (biology)
- cytology
- dehydration
- plasmons**
- SN (EXCLUDES ORGANIC CYTOPLASMIC CONDITIONS)
- GS electromagnetic radiation
- . **plasmons**
- elementary excitations
- . **plasmons**
- polaritons
- . **plasmons**
- RT electron gas
- excitons
- magnetohydrodynamic stability
- magnons
- phonons
- plasma frequencies
- plasma oscillations
- polarons
- surface plasmon resonance
- plasters**
- GS **plasters**
- . gypsum
- . paraplaster
- RT casts
- grout
- molding materials
- mortars (material)
- pastes
- plastic aircraft structures**
- GS aircraft structures
- . **plastic aircraft structures**
- RT aircraft construction materials
- aircraft survivability
- boron-epoxy composites
- glass fiber reinforced plastics
- plastics
- plastic anisotropy**
- GS anisotropy
- . **plastic anisotropy**
- . . elastic anisotropy
- RT viscoplasticity
- plastic bodies**
- RT beams (supports)
- ∞ bodies
- cylindrical bodies
- elastic bodies
- elastic plates
- elastoplasticity
- plastic properties
- plastic shells
- rigid structures
- plastic coatings**
- GS coatings
- . **plastic coatings**
- RT antiradar coatings
- encapsulating
- polymeric films
- protective coatings
- sprayed coatings
- plastic deformation**
- UF *Luder bands*
- plastic yielding*
- strain softening*
- GS deformation
- . **plastic deformation**
- RT ∞ bands
- bending
- Bordoni peaks
- creep properties
- creep tests
- ductile-brittle transition
- elastic deformation
- elongation
- friction stir welding
- J integral
- kink bands
- plane strain
- Saint Venant principle
- shear creep
- RT
- ∞ slip
- strain distribution
- stress propagation
- stress relaxation
- stress-strain relationships
- stretching
- structural strain
- superplastic forming
- superplasticity
- temperature inversions
- tensile creep
- tensile deformation
- thermomechanical treatment
- warpage
- work softening
- yield strength
- plastic fibers**
- (added June 1995)
- GS fibers
- . **plastic fibers**
- RT fiber optics
- glass fibers
- optical fibers
- plastic properties
- plastics
- waveguides
- plastic films*
- USE **polymeric films**
- plastic flow**
- GS fluid flow
- . **plastic flow**
- . . Tresca flow
- RT creep properties
- ∞ flow
- internal friction
- rheology
- shear flow
- steady state creep
- stress relaxation
- superplasticity
- viscoelasticity
- viscoplasticity
- plastic memory**
- RT shape memory alloys
- stress relaxation
- plastic plates**
- SN (STRUCTURAL PLATES EXHIBITING PLASTIC PROPERTIES)
- GS structural members
- . plates (structural members)
- . . **plastic plates**
- RT elastic plates
- elastoplasticity
- reinforced plates
- plastic propellants**
- GS propellants
- . solid propellants
- . . **plastic propellants**
- RT chemical fuels
- composite propellants
- explosives
- gelled propellants
- HTPB propellants
- monopropellants
- plasticizers
- polybutadiene tetranitramine
- pyrotechnics
- plastic properties**
- DEF The tendency of a loaded body to assume a deformed state other than its original state when the load is removed. Used for plasticity.
- UF *plasticity*
- GS mechanical properties
- . **plastic properties**
- . . elastoplasticity
- . . photoplasticity
- . . superplasticity
- . . thermoplasticity
- . . viscoplasticity
- . . yield point
- RT cohesion
- cold flow tests
- ductility
- elastic properties
- fatigue (materials)
- flexibility
- hardness
- influence coefficient
- method of characteristics
- plastic bodies
- plastic fibers
- ∞ properties
- rheology
- semisolids
- stress relaxation
- stress tensors
- structural stability
- plastic shells**
- GS shells (structural forms)
- . **plastic shells**
- RT cylindrical shells
- elastic shells
- elastoplasticity
- plastic bodies
- reinforced shells
- shell stability
- plastic tapes**
- RT adhesives
- magnetic tapes
- ∞ tapes
- plastic yielding*
- USE **plastic deformation**
- plasticity*
- USE **plastic properties**
- plasticizers**
- UF *casting solvents*
- elasticizers*
- GS additives
- . **plasticizers**
- RT case bonded propellants
- coatings
- Domino propellants
- esters
- plastic propellants
- propellant additives
- Skydrol (trademark)
- solid propellants
- solid rocket binders
- surfactants
- triacetin
- plastics**
- DEF Materials that contain as an essential ingredient one or more organic polymeric substances of large molecular weight, are solid in their finished state, and at some stage in their manufacture or processing into finished articles can be shaped by flow.
- GS **plastics**
- . Delrin (trademark)
- . Perspex (trademark)
- . polybutadiene
- . polyethylenes
- . . polyethylene terephthalate
- . polyisobutylene
- . polypropylene
- . polystyrene
- . . styrofoam (trademark)
- . polytetrafluoroethylene
- . . teflon (trademark)
- . polyvinyl alcohol
- . polyvinyl chloride
- . polyvinyl fluoride
- . reinforced plastics
- . . carbon fiber reinforced plastics
- . . carbon-phenolic composites
- . . glass fiber reinforced plastics
- . . micarta
- . synthetic resins
- . . addition resins
- . . . acrylic resins
- . . . vinyl copolymers

- . . polyester resins
- . . polyether resins
- . . . PEEK
- . . . polymethyl methacrylate
- . . thermoplastic resins
- . . . PEEK
- . . . quinoxalines
- . . . thermoplastic films
- . . thermosetting resins
- . . . epoxy resins
- . . . . phenolic epoxy resins
- . . . furan resins
- . . . . polyamide resins
- . . . . . Kevlar (trademark)
- . . . . . Nylon (trademark)
- . . . phenolic resins
- . . . . micarta
- . . . . phenolic epoxy resins

- RT acrylonitriles
- aramid fibers
- boron reinforced materials
- ∞ construction materials
- elastomers
- fluoropolymers
- furans
- injection molding
- ion exchange resins
- Kapton (trademark)
- ∞ materials science
- molding materials
- organic materials
- petroleum products
- plastic aircraft structures
- plastic fibers
- ∞ polymers
- sheet molding compounds
- tetrahydrofuran
- thioplastics

**plastids**

(added August 2004)

DEF Self-replicating cytoplasmic organelles of plant and algal cells that contain pigments and may synthesize and accumulate various substances. Plastids are used in phylogenetic studies.

- GS organelles
- . **plastids**
- RT algae
- cells (biology)
- cytology
- cytoplasm
- pigments
- plants (botany)

**plastisols**

DEF A suspension of a finely divided polymer in a plasticizer.

- GS mixtures
- . dispersions
- . . **plastisols**
- . . . smoke
- RT colloids
- composite propellants
- double base propellants
- resins

**PLAT system**

- UF *pilot landing aid television system*
- GS communication equipment
- . **PLAT system**
- telecommunication
- . **PLAT system**
- television systems
- . **PLAT system**
- RT landing aids
- ∞ systems

*plate (metal)*

USE **metal plates**

**plate theory**

- RT flat plates
- Mindlin plates
- structural analysis
- ∞ theories
- Treffitz method

**plateaus**

DEF Broadly, and comparatively flat areas

of great extent and elevation; specifically, extensive land regions considerably elevated (more than 150-300 meters in altitude) above the adjacent country or above sea level. They are commonly limited on at least one side by an abrupt descent, have a flat or nearly smooth surface but are often dissected by deep valleys and surmounted by high hills or high mountains, and have a large part of their total surface at or near the summit level. Plateaus are usually higher and have more noticeable relief than plains (they often represent elevated plains), and are usually higher and more extensive than mesas. They may be tectonic, residual, or volcanic in origin.

- GS landforms
- . terraces (landforms)
- . . **plateaus**
- . . . Allegheny Plateau (US)
- . . . Colorado Plateau (US)
- . . . Great Basin (US)
- . . . mesas
- . . . . buttes
- . . . piedmonts
- . . . . Central Piedmont (US)
- RT apexes
- erosion
- highlands
- ∞ peaks
- plains
- stratigraphy

**platelets**

- RT blood cell count
- blood coagulation
- blood groups
- histology
- thromboplastin

**platens**

- RT ∞ plates
- presses
- ∞ pressing
- punches
- rams (presses)
- rollers
- tools

∞ **plates**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT corrugating
- disks (shapes)
- flat plates
- metal coatings
- metal plates
- microchannel plates
- panels
- parallel plates
- photographic plates
- platens
- plates (structural members)
- plating
- rectangular plates
- scatter plates (optics)
- thick plates
- thin plates
- trays

**plates (structural members)**

- GS structural members
- . **plates (structural members)**
- . . anisotropic plates
- . . annular plates
- . . cantilever plates
- . . circular plates
- . . corrugated plates
- . . elastic plates
- . . end plates
- . . flat plates
- . . girder webs
- . . metal plates
- . . . boiler plate
- . . Mindlin plates
- . . orthotropic plates
- . . perforated plates
- . . plastic plates
- . . porous plates
- . . rectangular plates

- . . reinforced plates
- . . thick plates
- . . thin plates

- RT clamped structures
- girders
- metal sheets
- orthotropism
- ∞ plates
- Reissner theory
- slabs

**plates (tectonics)**

DEF Rigid divisions of the outer surface of the Earth (lithosphere) which moves over a weaker layer (asthenosphere). The plates are about 100 km thick, and the continents, which are 40 km thick, rest on the plates and moves with them.

- RT Earth crust
- Earth mantle
- Earth planetary structure
- earthquakes
- geological faults
- geophysics
- lithosphere
- neotectonics
- sea floor spreading
- structural properties (geology)
- subduction (geology)
- tectonics

∞ **platforms**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Automatic Universal Orbiting Stations
- data collection platforms
- flight mechanics
- floors
- flying platforms
- guidance (motion)
- inertial platforms
- landforms
- launching pads
- offshore platforms
- slabs
- solettas
- space platforms
- space stations
- stabilized platforms
- supports
- synchronous platforms

**plating**

- GS **plating**
- . electroplating
- . flame plating
- . ion plating
- . nickel plate
- RT anodic stripping
- cathodic coatings
- cladding
- deposition
- deposits
- electrodeposition
- electroless deposition
- finishes
- laminates
- metal coatings
- metal finishing
- metallizing
- ∞ plates
- protective coatings
- substrates
- thin films

**platinum**

- GS chemical elements
- . **platinum**
- . . platinum isotopes
- metals
- . transition metals
- . . **platinum**
- . . . platinum isotopes
- RT platinum black

**platinum alloys**

- GS alloys
- . **platinum alloys**
- RT iridium alloys

## platinum black

rhodium alloys

### platinum black

- GS particles
  - . metal particles
  - . . metal powder
  - . . . **platinum black**
  - . powder (particles)
  - . . metal powder
  - . . . **platinum black**
- RT catalysts
  - platinum

### platinum compounds

- GS **platinum compounds**
  - . platinum oxides
- RT ∞ chemical compounds
- ∞ Group 8 compounds
- ∞ metal compounds

### platinum isotopes

- GS chemical elements
  - . nuclides
  - . . isotopes
  - . . . **platinum isotopes**
  - . platinum
  - . . **platinum isotopes**
  - metals
  - . transition metals
  - . . platinum
  - . . . **platinum isotopes**

### platinum oxides

- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **platinum oxides**
  - platinum compounds
  - . **platinum oxides**

### playas

- GS land
  - . plains
  - . . **playas**
  - landforms
  - . plains
  - . . **playas**
- RT deserts
  - lakes

### playbacks

- RT magnetic tapes
  - ∞ recorders
  - recording
  - records
  - ∞ tapes
  - video disks

### PLC effect

- (added August 1997)
- USE **Portevin-le Chatelier effect**

### Pleiades cluster

- GS celestial bodies
  - . star clusters
  - . . open clusters
  - . . . **Pleiades cluster**
- RT ∞ clusters
  - Taurus constellation

### Pleistocene epoch

- (added May 2001)
- DEF Geologic epoch of the Quaternary period extending from about two million years ago to about 10,000 years ago and covering the last ice age.
- GS Cenozoic Era
  - . Quaternary period
  - . . **Pleistocene epoch**
- RT geochronology
  - Holocene epoch

### plenum chambers

- RT air intakes
  - ∞ chambers
  - ducts
  - exhaust systems
  - fuel systems
  - intake systems
  - manifolds

∞ water intakes

### plethysmography

- GS bioengineering
  - . biometrics
  - . . **plethysmography**
  - . . . electroplethysmography

### pleurae

- GS anatomy
  - . **pleurae**
  - membranes
  - . **pleurae**
- RT lungs
  - respiratory system

### pleurotin

- GS drugs
  - . antibiotics
  - . . **pleurotin**
- RT staphylococcus

### plexiglass (trademark)

- USE **polymethyl methacrylate**

### plies

- USE **layers**

### ∞ plots

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT charts
  - display devices
  - plotters
  - plotting
  - sites

### plotters

- UF *plotting instruments*
- GS recording instruments
  - . **plotters**
  - . . x-y plotters
- RT computer graphics
  - digital to analog converters
  - display devices
  - navigation aids
  - peripheral equipment (computers)
- ∞ plots
  - plotting
  - position indicators
  - printers
  - remote consoles

### plotting

- RT analog to digital converters
  - display devices
  - navigation
- ∞ plots
  - plotters
  - printing
  - recording

### plotting instruments

- USE **plotters**

### plowed fields

- USE **farmlands**

### plowing

- GS cultivation
  - . **plowing**
- RT agriculture
  - farm crops
  - farmlands
  - grasslands
  - planting
  - plants (botany)
  - plows
  - sod
  - tractors

### plows

- RT agriculture
  - mixers
  - planting

plowing

### PLSS

- USE **portable life support systems**

### plug nozzles

- GS exhaust nozzles
  - . **plug nozzles**
- RT aerospike engines
  - annular nozzles
  - conical nozzles
  - nozzle geometry
- ∞ nozzles
  - rocket nozzles
  - spike nozzles

### plugging

- UF *clogging*
- RT agglomeration
  - blocking
  - caulking
  - closing
  - closures
  - constrictions
  - fouling
  - plugs
  - sealing
  - seals (stoppers)

### plugs

- SN (EXCLUDES SPARKPLUGS OR ELECTRICAL CONNECTORS)
- GS seals (stoppers)
  - . **plugs**
- RT blocking
  - closures
  - labyrinth seals
  - outlets
  - plugging
  - stopping

### Plum Brook Reactor

- GS nuclear reactors
  - . liquid cooled reactors
  - . . water cooled reactors
  - . . . **Plum Brook Reactor**
  - . nuclear research and test reactors
  - . . **Plum Brook Reactor**

### plumage

- RT birds

### plumbane

- USE **lead compounds**
- metal hydrides**

### plumes

- GS **plumes**
  - . rocket exhaust
- RT chimneys
  - condensates
  - pollution transport
  - shock waves

### plungers

- RT mixers
  - pistons
  - rams (presses)
  - rams (pumps)

### Pluto (planet)

- GS celestial bodies
  - . dwarf planets
  - . . **Pluto (planet)**
  - . trans-Neptunian objects
  - . . **Pluto (planet)**
- RT Charon
  - Hydra
  - New Horizons mission
  - Nix
  - planets
  - Pluto atmosphere

### Pluto atmosphere

- GS environments
  - . extraterrestrial environments
  - . . planetary environments
  - . . . planetary atmospheres
  - . . . **Pluto atmosphere**

- RT Pluto (planet)
  - Pluto reactors**
    - GS nuclear reactors
      - . **Pluto reactors**
    - RT nuclear ramjet engines
      - . nuclear rocket engines
      - . supersonic low altitude missile
  - Pluto satellites**
    - (added July 1995)
    - GS celestial bodies
      - . natural satellites
      - . **Pluto satellites**
      - . . . Charon
      - . . . Hydra
      - . . . Nix
  - plutonium**
    - GS chemical elements
      - . actinide series
      - . transuranium elements
      - . . . **plutonium**
      - . . . . plutonium isotopes
      - . . . . . plutonium 238
      - . . . . . plutonium 239
      - . . . . . plutonium 240
      - . . . . . plutonium 241
      - . . . . . plutonium 244
      - . nuclides
      - . isotopes
      - . . . radioactive isotopes
      - . . . . transuranium elements
      - . . . . . **plutonium**
      - . . . . . . plutonium isotopes
      - . . . . . . . plutonium 238
      - . . . . . . . plutonium 239
      - . . . . . . . plutonium 240
      - . . . . . . . plutonium 241
      - . . . . . . . plutonium 244
      - metals
      - . actinide series
      - . transuranium elements
      - . . . **plutonium**
      - . . . . plutonium isotopes
      - . . . . . plutonium 238
      - . . . . . plutonium 239
      - . . . . . plutonium 240
      - . . . . . plutonium 241
      - . . . . . plutonium 244
    - RT fissionable materials
      - . nuclear fuels
  - plutonium 238**
    - GS chemical elements
      - . actinide series
      - . transuranium elements
      - . . . plutonium
      - . . . . plutonium isotopes
      - . . . . . **plutonium 238**
      - . nuclides
      - . isotopes
      - . . . radioactive isotopes
      - . . . . transuranium elements
      - . . . . . plutonium
      - . . . . . . plutonium isotopes
      - . . . . . . . **plutonium 238**
      - metals
      - . actinide series
      - . transuranium elements
      - . . . plutonium
      - . . . . plutonium isotopes
      - . . . . . **plutonium 238**
  - plutonium 239**
    - GS chemical elements
      - . actinide series
      - . transuranium elements
      - . . . plutonium
      - . . . . plutonium isotopes
      - . . . . . **plutonium 239**
      - . nuclides
      - . isotopes
      - . . . radioactive isotopes
      - . . . . transuranium elements
      - . . . . . plutonium
      - . . . . . . plutonium isotopes
      - . . . . . . . **plutonium 239**
      - metals
      - . actinide series
      - . transuranium elements
      - . . . plutonium
      - . . . . plutonium isotopes
      - . . . . . **plutonium 239**
  - . . . transuranium elements
  - . . . . plutonium
  - . . . . . plutonium isotopes
  - . . . . . . **plutonium 239**
  - . nuclides
  - . isotopes
  - . . . radioactive isotopes
  - . . . . transuranium elements
  - . . . . . plutonium
  - . . . . . . plutonium isotopes
  - . . . . . . . **plutonium 239**
  - metals
  - . actinide series
  - . transuranium elements
  - . . . plutonium
  - . . . . plutonium isotopes
  - . . . . . **plutonium 239**
- . . . transuranium elements
- . . . . plutonium
- . . . . . plutonium isotopes
- . . . . . . **plutonium 240**
- . nuclides
- . isotopes
- . . . radioactive isotopes
- . . . . transuranium elements
- . . . . . plutonium
- . . . . . . plutonium isotopes
- . . . . . . . **plutonium 240**
- metals
- . actinide series
- . transuranium elements
- . . . plutonium
- . . . . plutonium isotopes
- . . . . . **plutonium 240**
- plutonium 241**
  - GS chemical elements
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium 241**
    - . nuclides
    - . isotopes
    - . . . radioactive isotopes
    - . . . . transuranium elements
    - . . . . . plutonium
    - . . . . . . plutonium isotopes
    - . . . . . . . **plutonium 241**
    - metals
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium 241**
- plutonium 244**
  - GS chemical elements
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium 244**
    - . nuclides
    - . isotopes
    - . . . radioactive isotopes
    - . . . . transuranium elements
    - . . . . . plutonium
    - . . . . . . plutonium isotopes
    - . . . . . . . **plutonium 244**
    - metals
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium 244**
- plutonium alloys**
  - GS alloys
    - . **plutonium alloys**
  - RT nuclear fuel elements
    - . nuclear fuels
- plutonium carbides*
- USE **plutonium compounds**
- plutonium compounds**
  - UF *plutonium carbides*
  - GS actinide series compounds
    - . **plutonium compounds**
    - . . . plutonium fluorides
    - . . . plutonium oxides
  - RT ceramic nuclear fuels
    - $\infty$  chemical compounds
    - $\infty$  metal compounds
    - . nuclear fuels
- plutonium fluorides**
  - GS actinide series compounds
    - . plutonium compounds
    - . . . **plutonium fluorides**
    - halogen compounds
    - . fluorine compounds
    - . . . fluorides
    - . . . . metal fluorides
    - . . . . . **plutonium fluorides**
    - . halides
    - . . . fluorides
    - . . . . metal fluorides
    - . . . . . **plutonium fluorides**
    - . metal halides
    - . . . metal fluorides
    - . . . . **plutonium fluorides**
- plutonium isotopes**
  - GS chemical elements
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium isotopes**
    - . . . . . . plutonium 238
    - . . . . . . . plutonium 239
    - . . . . . . . plutonium 240
    - . . . . . . . plutonium 241
    - . . . . . . . plutonium 244
    - . nuclides
    - . isotopes
    - . . . radioactive isotopes
    - . . . . transuranium elements
    - . . . . . plutonium
    - . . . . . . plutonium isotopes
    - . . . . . . . **plutonium isotopes**
    - . . . . . . . . plutonium 238
    - . . . . . . . . plutonium 239
    - . . . . . . . . plutonium 240
    - . . . . . . . . plutonium 241
    - . . . . . . . . plutonium 244
    - metals
    - . actinide series
    - . transuranium elements
    - . . . plutonium
    - . . . . plutonium isotopes
    - . . . . . **plutonium isotopes**
    - . . . . . . plutonium 238
    - . . . . . . . plutonium 239
    - . . . . . . . plutonium 240
    - . . . . . . . plutonium 241
    - . . . . . . . plutonium 244
- plutonium oxides**
  - GS actinide series compounds
    - . plutonium compounds
    - . . . **plutonium oxides**
    - chalcogenides
    - . oxides
    - . . . metal oxides
    - . . . . **plutonium oxides**
  - RT ceramic nuclear fuels
    - . mixed oxides
- plutonium recycle test reactor**
  - UF *PRTR (reactor)*
  - GS nuclear electric power generation
    - . nuclear power reactors
    - . . . **plutonium recycle test reactor**
    - nuclear reactors
    - . liquid cooled reactors
    - . . . water cooled reactors
    - . . . . heavy water reactors
    - . . . . . **plutonium recycle test reactor**
    - . nuclear power reactors
    - . . . **plutonium recycle test reactor**
    - . nuclear research and test reactors
    - . . . **plutonium recycle test reactor**
    - . water moderated reactors
    - . . . **plutonium recycle test reactor**
- pluviographs*
- USE **rain gages**
- recording instruments**
- ply orientation**
  - DEF The arrangement of bonded layers comprising laminated materials to obtain optimal strength or other characteristics.
  - RT alignment
    - . composite materials
    - . interlayers
    - . laminates
    - $\infty$  layers
    - . multilayer insulation



## plywood

∞ orientation  
plywood  
positioning  
sandwich structures  
stacking sequence (composite materials)  
substrates

### plywood

GS composite materials  
. **plywood**  
composite structures  
. laminates  
. . **plywood**  
wood  
. **plywood**  
RT ply orientation  
trees (plants)  
wooden structures

*PML (electromagnetism)*  
(added July 1998)

USE **perfectly matched layers**

### p-n junctions

UF *n-p junctions*  
GS semiconductor junctions  
. **p-n junctions**  
RT ∞ junctions  
SIS (semiconductors)

### pneumatic circuits

GS circuits  
. **pneumatic circuits**  
pneumatic equipment  
. **pneumatic circuits**  
RT fluidics  
valves

### pneumatic control

UF *pneumatic reset*  
RT automatic control  
automatic control valves  
compressed gas  
∞ control  
control equipment  
control valves  
controllers  
electronic control  
engine control  
fluid power  
fluidics  
hydraulic control  
remote control

### pneumatic equipment

GS **pneumatic equipment**  
. gas valves  
. pneumatic circuits  
. pneumatic probes  
RT air bag restraint devices  
compressed air  
cushions  
∞ equipment  
fluid amplifiers  
fluid power  
fluid switching elements  
fluidics  
gas generators  
Golay detector cells  
inflatable structures  
servocontrol  
servomechanisms  
shock absorbers  
∞ systems  
valves

### pneumatic probes

GS measuring instruments  
. temperature measuring instruments  
. . **pneumatic probes**  
pneumatic equipment  
. **pneumatic probes**  
RT flow measurement  
high temperature gases  
mass flow rate  
nozzle flow

pressure measurement

*pneumatic reset*

USE **pneumatic control**

### pneumatics

DEF The branch of physics dealing with the mechanical properties of gases with particular emphasis on gas statics in closed systems.

GS mechanics (physics)  
. fluid mechanics  
. . **pneumatics**  
RT flow theory  
fluid power  
fluidics  
gases  
∞ hydraulics

*pneumographs*

USE **pneumography**

### pneumography

UF *pneumographs*  
RT biotelemetry  
lungs  
∞ measurement  
radiography

### pneumonia

GS diseases  
. respiratory diseases  
. . **pneumonia**  
RT acquired immunodeficiency syndrome  
bacterial diseases  
congestion  
viral diseases

### pneumothorax

RT diseases  
lungs  
medical science

*pnictides*

USE **Group 5A compounds**

### p-n-p junctions

GS semiconductor junctions  
. **p-n-p junctions**  
RT ∞ junctions

### p-n-p-n junctions

GS semiconductor junctions  
. **p-n-p-n junctions**  
RT ∞ junctions  
latch-up  
thyristors

*Pockels effect*

USE **birefringence**

### pocket mice

GS animals  
. vertebrates  
. . mammals  
. . . rodents  
. . . . mice  
. . . . . **pocket mice**  
RT rats

### Pods (external stores)

GS external stores  
. **Pods (external stores)**  
RT cowlings  
external store separation  
fuel tanks  
nacelles  
wing-fuselage stores

### POGO

UF *Polar Orbit Geophysical Observatory*  
GS artificial satellites  
. geophysical satellites  
. . OGO  
. . . **POGO**  
. . . . OGO-4  
. . . . OGO-6  
. . . . OGO-C  
observatories  
. geophysical observatories  
. . OGO  
. . . **POGO**

. . . . OGO-4  
. . . . OGO-6  
. . . . OGO-C  
RT Agena B rocket vehicle  
EGO

### POGO effects

GS vibration  
. **POGO effects**  
vibration effects  
. **POGO effects**  
RT ∞ effects  
longitudinal stability

### Pohlhausen method

UF *Pohlhausen solution*  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **Pohlhausen method**  
RT laminar boundary layer  
∞ methodology  
velocity distribution  
viscous flow

*Pohlhausen solution*

USE **Pohlhausen method**

### poikilothermia

UF *cold blooded animals*  
GS animals  
. **poikilothermia**  
RT amphibia  
body temperature  
fishes  
invertebrates  
reptiles

### Poincare problem

RT ∞ problems

### Poincare spheres

GS symmetrical bodies  
. bodies of revolution  
. . spheres  
. . . **Poincare spheres**  
RT geometry

### point defects

GS defects  
. crystal defects  
. . **point defects**  
. . . vacancies (crystal defects)  
. . . . Frenkel defects  
. . . . antisite defects  
RT crystal dislocations  
impurities  
surface defects

### point impact

GS impact  
. **point impact**  
RT electron impact  
hypervelocity impact  
ion impact  
proton impact

*point matching method (mathematics)*

USE **boundary value problems**

### point sources

GS radiation sources  
. **point sources**  
RT diffuse radiation  
∞ energy sources  
Huygens principle  
light sources  
spherical waves

### point spread functions

DEF Mathematical functions involved in image processing.  
GS functions (mathematics)  
. **point spread functions**  
RT image processing

### point to point communication

GS communicating  
. **point to point communication**  
. . NASCOM network  
RT radio communication

- telecommunication  
Westar satellites  
wideband communication
- pointers*  
USE **dials**
- pointing control systems**  
GS **pointing control systems**  
. annular suspension and pointing system  
RT ∞ control  
entry guidance (STS)  
flight control  
guidance (motion)  
space flight  
spacecraft control  
∞ systems
- ∞ **points**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
RT nonpoint sources  
points (mathematics)  
position (location)
- points (mathematics)**  
GS geometry  
. Euclidean geometry  
. . . **points (mathematics)**  
. . . fixed points (mathematics)  
. . . inflection points  
RT foci  
loci  
naked singularities  
∞ points  
reciprocal theorems  
singularity (mathematics)
- Poiseuille flow*  
USE **laminar flow**
- ∞ **poisoning**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
RT benzene poisoning  
beryllium poisoning  
carbon monoxide poisoning  
carbon tetrachloride poisoning  
curare  
hydrocarbon poisoning  
intoxication  
lead poisoning  
narcosis  
poisoning (reaction inhibition)  
toxic diseases  
toxic hazards
- poisoning (reaction inhibition)**  
RT control rods  
neutron absorbers  
nuclear reactions  
∞ poisoning  
radioactive wastes
- poisoning (toxicology)*  
USE **toxic diseases**
- poisons**  
GS **poisons**  
. curare  
. endotoxins  
. pesticides  
. . . insecticides  
. . . Carbamates (tradenam)  
. . . . urethanes  
. . . DDT  
. . . dieldrin  
. . . phenothiazines  
. phosgene  
. strychnine  
RT environment effects  
environment pollution  
environmental surveys  
hazardous materials  
nonpoint sources  
pollution
- toxicity
- Poisson density functions**  
UF *poisson process*  
GS functions (mathematics)  
. **Poisson density functions**  
statistical analysis  
. **Poisson density functions**  
RT continuity (mathematics)  
discrete functions  
exponential functions  
sorting algorithms
- Poisson equation**  
GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **Poisson equation**  
RT classical mechanics  
electrostatics  
∞ equations  
isentrope  
Laplace equation  
vortex in cell technique
- poisson process*  
USE **Poisson density functions**  
**stochastic processes**
- Poisson ratio**  
GS mechanical properties  
. **Poisson ratio**  
ratios  
. **Poisson ratio**  
RT Airy function  
compressive strength  
elastic properties  
fiber strength  
modulus of elasticity  
nu factor  
stress-strain diagrams  
tensile strength
- Polaire satellite*  
USE **D-2 satellites**
- Poland**  
GS nations  
. **Poland**  
RT Central Europe  
Europe
- polar auroras*  
USE **auroras**
- polar cap absorption**  
GS energy absorption  
. radiation absorption  
. . electromagnetic absorption  
. . . **polar cap absorption**  
. thermal absorption  
. . **polar cap absorption**  
RT ∞ absorption
- polar caps**  
RT Antarctic regions  
Arctic regions  
∞ caps  
Earth (planet)  
Earth cryosphere  
ice  
Mars (planet)  
planetary cryospheres
- polar coordinates**  
DEF In a plane, a system of curvilinear coordinates in which a point is located by its distance  $r$  from the origin (or pole) and by the angle  $\theta$  which a line (radius vector) joining the given point and the origin makes a fixed reference line, called the polar axis. In three dimensions, short for space polar coordinates.  
GS coordinates  
. **polar coordinates**  
RT astronomical coordinates  
planispheres  
Smith chart
- spherical coordinates
- polar cusps**  
RT aeronomy  
∞ cusps  
Earth magnetosphere  
geomagnetic latitude  
geomagnetic tail  
geomagnetism  
geophysics  
interplanetary space  
lines of force  
magnetic field configurations  
magnetic fields  
magnetopause  
planetary magnetic fields  
polar regions  
Polar/GGS spacecraft  
space plasmas
- polar gases**  
GS gases  
. molecular gases  
. . **polar gases**  
RT carbon dioxide lasers  
gas composition  
gas discharges  
gas dynamics  
gas lasers  
gas masers  
polarization (charge separation)
- polar ionosphere beacon*  
USE **Beacon satellites**
- polar meteorology**  
GS meteorology  
. **polar meteorology**  
RT aerology  
climatology  
hydrology  
ice reporting
- polar navigation**  
GS navigation  
. **polar navigation**  
RT air navigation  
celestial navigation  
dead reckoning  
digital navigation  
inertial navigation  
loran
- Polar Orbit Geophysical Observatory*  
USE **POGO**
- polar orbits**  
GS orbits  
. **polar orbits**  
RT circular orbits  
Earth orbits  
elliptical orbits  
equatorial orbits  
low Earth orbits  
lunar orbits  
lunar satellites  
NPOESS  
planetary orbits  
space station polar platforms  
TIROS satellites  
twenty-four hour orbits
- Polar Plasma Laboratory*  
(added January 2001)  
USE **Polar/GGS spacecraft**
- polar platforms (space stations)*  
USE **space station polar platforms**
- polar radio blackout**  
GS electromagnetic interference  
. radio frequency interference  
. . blackout (propagation)  
. . . **polar radio blackout**  
RT auroral zones  
ionospheric propagation
- polar regions**  
UF *high latitudes*  
GS regions  
. **polar regions**

## polar substorms

- . . Antarctic regions
- . . . McMurdo sound
- . . . Ross ice shelf
- . . Arctic regions
- . . . subarctic regions
- RT auroral zones
- climatology
- geography
- permafrost
- polar cusps
- polynyas
- temperate regions
- timberline

### polar substorms

- GS magnetic disturbances
- . magnetic storms
- . . **polar substorms**
- storms
- . magnetic storms
- . . **polar substorms**

### polar wandering (geology)

DEF Migration during geologic time of the Earth's poles of rotation and magnetic poles. Also known as polar migration. Used for Chandler motion.

- UF *Chandler motion*
- RT Chandler wobble
- Earth axis
- ∞ Earth motion
- Earth orientation
- geodesy
- nutiation
- periodic variations
- precession

### Polar/GGS spacecraft

(added January 2001)

DEF One of two NASA spacecraft in the Global Geospace Science (GGS) initiative and part of the International Solar Terrestrial Physics (ISTP) program. Polar (Polar Plasma Laboratory) measures solar wind entry, ionospheric output, and the depositions of energy into the neutral atmosphere at high latitudes. Imaging instruments make possible the measurement of visible, ultraviolet, and X-ray spectra of the polar caps. The spacecraft was launched in February 1996.

- UF *Polar Plasma Laboratory*
- GS artificial satellites
- . geophysical satellites
- . . **Polar/GGS spacecraft**
- . scientific satellites
- . . **Polar/GGS spacecraft**
- RT auroras
- Earth ionosphere
- Earth magnetosphere
- geomagnetism
- plasma waves
- polar cusps
- solar terrestrial interactions
- solar wind
- space plasmas
- space weather
- Wind/GGS spacecraft

### polarimeters

DEF Instruments for determining the degree of polarization of electromagnetic radiation, specifically the polarization of light. Used for spectropolarimeters.

- UF *spectropolarimeters*
- GS measuring instruments
- . optical measuring instruments
- . . **polarimeters**
- optical equipment
- . optical measuring instruments
- . . **polarimeters**
- RT astronomical polarimetry
- chemical analysis
- ellipsometers
- optical measurement
- photometers
- polarimetry
- polariscopes
- polarizers
- polarography

Solar Maximum Mission

### polarimetry

- GS optical measurement
- . **polarimetry**
- . . astronomical polarimetry
- RT optical activity
- optical measuring instruments
- photometry
- polarimeters
- polarization (waves)

### Polaris A1 missile

- GS missiles
- . ballistic missiles
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A1 missile**
- . surface to surface missiles
- . . fleet ballistic missiles
- . . . **Polaris A1 missile**
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A1 missile**

### Polaris A2 missile

- GS missiles
- . ballistic missiles
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A2 missile**
- . surface to surface missiles
- . . fleet ballistic missiles
- . . . **Polaris A2 missile**
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A2 missile**

### Polaris A3 missile

- GS missiles
- . ballistic missiles
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A3 missile**
- . surface to surface missiles
- . . fleet ballistic missiles
- . . . **Polaris A3 missile**
- . . intermediate range ballistic missiles
- . . . polaris missiles
- . . . . **Polaris A3 missile**

### polaris missiles

- GS missiles
- . ballistic missiles
- . . intermediate range ballistic missiles
- . . . **polaris missiles**
- . . . . Polaris A1 missile
- . . . . Polaris A2 missile
- . . . . Polaris A3 missile
- . surface to surface missiles
- . . intermediate range ballistic missiles
- . . . **polaris missiles**
- . . . . Polaris A1 missile
- . . . . Polaris A2 missile
- . . . . Polaris A3 missile
- RT multistage rocket vehicles
- solid propellant rocket engines
- XM-33 engine

### Polaris submarines

USE **guided missile submarines**

### polariscopes

DEF Instruments for detecting polarized radiation and investigating its properties.

- GS measuring instruments
- . **polariscopes**
- . . Senarmont polariscopes
- optical equipment
- . **polariscopes**
- . . Senarmont polariscopes
- RT optical measuring instruments
- polarimeters
- polarization (waves)
- polarizers

### polaritons

GS **polaritons**

. plasmons

### polarity

DEF The sign of the electric discharge associated with a given object, as an electrode or an ion.

- RT ∞ dipoles
- electric charge
- electric fields
- magnetic fields
- magnetic poles
- polarization (charge separation)
- polarization (spin alignment)
- quadrupoles

### ∞ polarization

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)

DEF The state of electromagnetic radiation when transverse vibrations take place in some regular manner, e.g., all in one plane, in a circle, in an ellipse, or in some other definite curve. With respect to particles in an electric field, the displacement of the charge centers within a particle in response to the electric force acting thereon. The response of the molecules of a paramagnetic medium (such as iron) when subjected to a magnetic field.

- RT antiferroelectricity
- bipolarity
- linear polarization
- magnetization
- optical polarization
- Overhauser effect
- photoelastic analysis
- polarization (charge separation)
- polarization (spin alignment)
- polarization (waves)
- polarized radiation

### polarization (charge separation)

UF *charge separation*

GS **polarization (charge separation)**

- . dielectric polarization
- . electrolytic polarization

- RT charge distribution
- charge transfer
- deactivation
- depolarization
- electrets
- electric charge
- electric moments
- electrode film barriers
- electromigration
- Hall effect
- ionospheric drift
- magnetization
- overvoltage
- polar gases
- polarity
- ∞ polarization
- pyroelectricity
- ∞ separation
- Tafel law

### polarization (spin alignment)

- RT alignment
- anisotropy
- deactivation
- magnetic properties
- magnetization
- ∞ orientation
- polarity
- ∞ polarization
- rotation
- spin tests

### polarization (waves)

- UF *polarization charts*
- GS **polarization (waves)**
- . circular polarization
- . cross polarization
- . elliptical polarization
- . linear polarization
- RT anisotropic media
- anisotropy
- beamforming
- birefringence
- BL Lacertae objects

collimation  
 electromagnetic properties  
 Faraday effect  
 Kerr electrooptical effect  
 Kerr magneto-optical effect  
 magneto-optics  
 monochromatization  
 optical coupling  
 optical properties  
 ∞ orientation  
 photoelastic analysis  
 polarimetry  
 polariscopes  
 ∞ polarization  
 polarization modulation  
 polarized electromagnetic radiation  
 polarizers  
 polarons  
 refractivity  
 rotation

**polarization characteristics**  
 GS magnetic properties  
 . **polarization characteristics**  
 RT Brewster angle  
 ∞ characteristics  
 polarized radiation  
 zwitterions

*polarization charts*  
 USE **graphs (charts)**  
**polarization (waves)**

**polarization modulation**  
*(added March 1995)*  
 GS modulation  
 . **polarization modulation**  
 RT light modulation  
 optical communication  
 optical polarization  
 polarization (waves)  
 polarized electromagnetic radiation

**polarized elastic waves**  
 GS elastic waves  
 . **polarized elastic waves**  
 polarized radiation  
 . **polarized elastic waves**  
 RT S waves  
 seismic waves  
 sound waves

**polarized electromagnetic radiation**  
 GS electromagnetic radiation  
 . **polarized electromagnetic radiation**  
 . . polarized light  
 . . synchrotron radiation  
 polarized radiation  
 . **polarized electromagnetic radiation**  
 . . polarized light  
 . . synchrotron radiation  
 RT cross polarization  
 extraterrestrial radiation  
 Faraday effect  
 infrared radiation  
 Kerr cells  
 light (visible radiation)  
 linear polarization  
 Lyman alpha radiation  
 Lyman beta radiation  
 magneto-optics  
 monochromatic radiation  
 polarization (waves)  
 polarization modulation  
 polarizers  
 ∞ radiation  
 radiative transfer  
 radio waves  
 stellar radiation  
 ultraviolet radiation

**polarized light**  
 GS electromagnetic radiation  
 . light (visible radiation)  
 . . **polarized light**  
 . polarized electromagnetic radiation  
 . . **polarized light**  
 polarized radiation

. polarized electromagnetic radiation  
 . . **polarized light**  
 RT ellipsometry  
 gegenschein  
 Kerr magneto-optical effect  
 monochromatic radiation  
 optical activity  
 optical depolarization  
 optical polarization  
 photoelasticity  
 zodiacal light

**polarized radiation**  
 GS **polarized radiation**  
 . polarized elastic waves  
 . polarized electromagnetic radiation  
 . . polarized light  
 . . synchrotron radiation  
 RT caustics (optics)  
 elastic waves  
 electromagnetic radiation  
 extraterrestrial radiation  
 linear polarization  
 plasma radiation  
 ∞ polarization  
 polarization characteristics  
 ∞ radiation  
 ∞ rays

**polarizers**  
 DEF Devices for polarizing radiant energy.  
 RT Kerr cells  
 light (visible radiation)  
 optical polarization  
 polarimeters  
 polariscopes  
 polarization (waves)  
 polarized electromagnetic radiation

*polarographs*  
 USE **polarography**

**polarography**  
 UF *polarographs*  
 GS electrical measurement  
 . **polarography**  
 RT chemical analysis  
 optical polarization  
 polarimeters  
 quantitative analysis

**polarons**  
 GS elementary excitations  
 . **polarons**  
 particles  
 . charged particles  
 . . energetic particles  
 . . . electrons  
 . . . . **polarons**  
 . corpuscular radiation  
 . . energetic particles  
 . . . electrons  
 . . . . **polarons**  
 . elementary particles  
 . . fermions  
 . . . leptons  
 . . . . electrons  
 . . . . . **polarons**  
 RT conduction bands  
 cross polarization  
 electron phonon interactions  
 ionic crystals  
 phonons  
 plasmons  
 polarization (waves)

∞ **poles**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT ∞ dipoles  
 magnetic dipoles  
 magnetic poles  
 monopoles  
 poles (supports)  
 Regge poles

**poles (supports)**  
 RT electric power transmission

∞ poles

**police**  
 GS personnel  
 . **police**  
 RT communities  
 crime  
 military personnel  
 regulations  
 security  
 social factors  
 violence

**policies**  
 GS **policies**  
 . energy policy  
 . foreign policy  
 . . international relations  
 . . . international cooperation  
 . . . . outer space treaty  
 . patent policy  
 . procurement policy  
 RT copyrights  
 governments  
 licensing  
 prohibition  
 regulations  
 rules

**poliomyelitis**  
 GS diseases  
 . infectious diseases  
 . . viral diseases  
 . . . **poliomyelitis**

*Polish TS-11 aircraft*  
 USE **TS-11 aircraft**

*polished metals*  
 USE **metal polishing**

**polishing**  
 GS **polishing**  
 . metal polishing  
 . . electropolishing  
 . vibratory polishing  
 RT abrasion  
 cleaning  
 finishes  
 grinding (material removal)  
 metallography  
 smoothing  
 surface finishing  
 ultrasonic cleaning

**politics**  
 RT air law  
 communities  
 culture (social sciences)  
 governments  
 international cooperation  
 international law  
 law (jurisprudence)  
 nations  
 regimes  
 sociology  
 sovereignty  
 United Nations  
 voting  
 warfare

**pollen**  
 GS particles  
 . **pollen**  
 RT aerobiology  
 air pollution  
 dust  
 plants (botany)

*pollutants*  
 USE **contaminants**

**pollution**  
 GS **pollution**  
 . environment pollution  
 . . air pollution  
 . . . global air pollution  
 . . . indoor air pollution  
 . . soil pollution  
 . . water pollution

## **pollution control**

- . . . oil pollution
- . . . noise pollution
- . . . thermal pollution
- RT clean fuels
- contaminants
- contamination
- debris
- decontamination
- dissipation
- elimination
- endangered species
- energy policy
- environment effects
- environment protection
- environmental quality
- environmental surveys
- human wastes
- metabolic wastes
- Microcystis
- microorganisms
- nonpoint sources
- oil slicks
- poisons
- prevention
- public health
- purity
- quality
- radioactive wastes
- smoke abatement
- solid wastes
- toxicology
- waste disposal
- wastes
- water
- water reclamation
- water treatment

**pollution control**

- GS environmental control
- . **pollution control**
- RT air quality
- biochemical oxygen demand
- ∞ control
- dewatering
- environmental cleanup
- environmental surveys
- flue gases
- fly ash
- particulates

**pollution monitoring**

- RT air pollution
- air quality
- ambience
- environment pollution
- global air pollution
- ground stations
- in situ measurement
- monitors
- particulates
- soil pollution
- warning systems
- water pollution
- water sampling

**pollution transport**

- DEF Dispersing or diffusion of atmospheric or water pollutants. Used for atmospheric loading.
- UF *atmospheric loading*
- GS environmental transport
- . **pollution transport**
- RT aerosols
- air pollution
- atmospheric circulation
- atmospheric diffusion
- combustion products
- dispersing
- environment pollution
- exhaust emission
- exhaust gases
- gas transport
- gaseous diffusion
- global air pollution
- plumes
- thermal pollution
- trace contaminants
- transport properties
- transport theory
- water circulation

water pollution

**poloidal flux**

- DEF Plasma confinement concept with multipole magnetic fields.
- RT magnetic field configurations
- tokamak devices
- toroidal plasmas

**polonium**

- GS chemical elements
- . metalloids
- . . **polonium**
- . . . polonium isotopes
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- RT metals

**polonium 208**

- GS chemical elements
- . metalloids
- . . polonium
- . . . polonium isotopes
- . . . . **polonium 208**
- . . . . nuclides
- . . . . isotopes
- . . . . polonium isotopes
- . . . . **polonium 208**
- . . . . radioactive isotopes
- . . . . **polonium 208**
- RT metals

**polonium 209**

- GS chemical elements
- . metalloids
- . . polonium
- . . . polonium isotopes
- . . . . **polonium 209**
- . . . . nuclides
- . . . . isotopes
- . . . . polonium isotopes
- . . . . **polonium 209**
- . . . . radioactive isotopes
- . . . . **polonium 209**
- RT metals

**polonium 210**

- GS chemical elements
- . metalloids
- . . polonium
- . . . polonium isotopes
- . . . . **polonium 210**
- . . . . nuclides
- . . . . isotopes
- . . . . polonium isotopes
- . . . . **polonium 210**
- . . . . radioactive isotopes
- . . . . **polonium 210**
- RT metals

**polonium compounds**

- RT ∞ chemical compounds
- ∞ Group 6A compounds

**polonium isotopes**

- GS chemical elements
- . metalloids
- . . polonium
- . . . **polonium isotopes**
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- . . . . nuclides
- . . . . isotopes
- . . . . **polonium isotopes**
- . . . . polonium 208
- . . . . polonium 209
- . . . . polonium 210
- RT metals

**polyacetylene**

- DEF An aliphatic organic polymer that has high semiconductor properties which can be enhanced by doping.
- RT conducting polymers

semiconductors (materials)

*polyacrylates*

USE **acrylic resins**

**polyacrylonitrile**

- (added January 1990)
- UF *PAN (polyacrylonitrile)*
- GS nitrogen compounds
- . nitriles
- . . acrylonitriles
- . . . **polyacrylonitrile**
- . . . nitrogen polymers
- . . . **polyacrylonitrile**
- organic compounds
- . nitriles
- . . acrylonitriles
- . . . **polyacrylonitrile**
- RT acrylic resins
- carbon fibers
- ∞ polymers
- synthetic fibers

**polyamide resins**

- UF *nylon resins*
- GS plastics
- . synthetic resins
- . . thermosetting resins
- . . . furan resins
- . . . . **polyamide resins**
- . . . . . Kevlar (trademark)
- . . . . . Nylon (trademark)
- resins
- . synthetic resins
- . . thermosetting resins
- . . . furan resins
- . . . . **polyamide resins**
- . . . . . Kevlar (trademark)
- . . . . . Nylon (trademark)
- RT aramid fiber composites
- aramid fibers

**polyatomic gases**

- GS gases
- . molecular gases
- . . **polyatomic gases**
- . . . diatomic gases

**polyatomic molecules**

- GS molecules
- . **polyatomic molecules**
- . . diatomic molecules
- . . . triatomic molecules
- RT atoms
- buckminsterfullerene
- chemical bonds
- ∞ chemical compounds
- fullerenes
- ions
- molecular structure
- molecular weight
- positive ions

**polybenzimidazole**

- GS nitrogen compounds
- . nitrogen polymers
- . . **polybenzimidazole**
- RT synthetic fibers

*polyblends*

USE **polymer blends**

**polybrominated biphenyls**

- DEF A group of 209 chemicals whose toxicity varies and includes principally one fire retardant called firemaster. Used for PBB.
- UF *PBB*
- GS phenyls
- . **polybrominated biphenyls**
- toxins and antitoxins
- . **polybrominated biphenyls**
- RT bromine compounds
- flame retardants
- polychlorinated biphenyls

**polybutadiene**

- GS organic compounds
- . hydrocarbons
- . . aliphatic hydrocarbons
- . . . dienes

- ... **polybutadiene**
  - plastics
- RT **polybutadiene**
  - addition resins
  - block copolymers
  - butadiene
  - HTPB propellants
  - synthetic rubbers
- polybutadiene tetranitramine**
  - GS nitrogen compounds
    - . nitro compounds
    - . . . **polybutadiene tetranitramine**
    - . nitrogen polymers
    - . . . **polybutadiene tetranitramine**
  - RT plastic propellants
- polycarbonates**
  - GS carbon compounds
    - . carbonates
    - . . . **polycarbonates**
    - . . . Lexan (trademark)
    - esters
      - . **polycarbonates**
      - . . Lexan (trademark)
  - RT polycarbosilanes
    - ∞ polymers
- polycarbosilanes**
  - (added July 1991)
  - GS silicon polymers
    - . polysilanes
    - . . . **polycarbosilanes**
  - RT ceramic fibers
    - organometallic polymers
    - polycarbonates
    - silanes
    - silicon carbides
- polychlorinated biphenyls**
  - UF *PCB*
  - GS phenyls
    - . **polychlorinated biphenyls**
  - RT polybrominated biphenyls
- polycrystals**
  - GS crystals
    - . **polycrystals**
  - RT bicrystals
    - crystal structure
    - single crystals
- polycyclic aromatic hydrocarbons**
  - (added November 1994)
  - UF *PAH*
  - GS organic compounds
    - . cyclic compounds
    - . . cyclic hydrocarbons
    - . . . **polycyclic aromatic hydrocarbons**
    - . hydrocarbons
      - . . cyclic hydrocarbons
      - . . . **polycyclic aromatic hydrocarbons**
  - RT ∞ aromatic compounds
    - combustion products
    - cosmic dust
    - diffuse interstellar bands
    - graphene
    - interstellar matter
- polycythemia**
  - RT hemoglobin
    - hemolysis
    - hemorrhages
    - spleen
- polyester resins**
  - GS plastics
    - . synthetic resins
    - . . **polyester resins**
    - resins
      - . synthetic resins
      - . . **polyester resins**
  - RT Dacron (trademark)
    - thermosetting resins
- polyesters**
  - DEF Polymers in which the repeated structural unit in the chain is of the ester type.
- GS esters
  - . **polyesters**
- RT ∞ polymers
  - synthetic fibers
- polyether resins**
  - GS plastics
    - . synthetic resins
    - . . **polyether resins**
    - . . . PEEK
    - . . . polymethyl methacrylate resins
    - . synthetic resins
      - . . **polyether resins**
      - . . . PEEK
      - . . . polymethyl methacrylate
  - RT vulcanized elastomers
- polyetheretherketones*
  - USE **PEEK**
- polyethylene terephthalate**
  - GS esters
    - . **polyethylene terephthalate**
    - plastics
      - . polyethylenes
      - . . **polyethylene terephthalate**
    - terephthalate
      - . **polyethylene terephthalate**
  - RT addition resins
    - Mylar (trademark)
    - ∞ polymers
- polyethylenes**
  - GS plastics
    - . **polyethylenes**
    - . . polyethylene terephthalate
  - RT addition resins
    - ethylene
    - synthetic resins
    - thermoplastic resins
- polygonization**
  - RT crystal defects
    - crystal growth
    - recrystallization
- polygons**
  - GS geometry
    - . Euclidean geometry
    - . . **polygons**
    - . . . hexagons
    - . . . tetragons
      - . . . . parallelograms
      - . . . . rhomboids
      - . . . . rectangles
      - . . . . squares (mathematics)
      - . . . . trapezoids
      - . . . triangles
  - RT polytopes
- polyhedrons**
  - GS geometry
    - . Euclidean geometry
    - . . **polyhedrons**
    - . . . cubes (mathematics)
    - . . . icosahedrons
    - . . . octahedrons
    - . . . parallelepipeds
    - . . . pyramids
    - . . . rhombohedrons
    - . . . tetrahedrons
  - RT buckminsterfullerene
    - fullerenes
    - polytopes
- polyimide resins**
  - GS resins
    - . **polyimide resins**
  - RT bismaleimide
    - polyimides
    - resin matrix composites
- polyimides**
  - GS nitrogen compounds
    - . amides
    - . . **polyimides**
    - . . . bismaleimide
    - . . . Kapton (trademark)
- RT polyimide resins
- polyisobutylene**
  - GS plastics
    - . **polyisobutylene**
  - RT addition resins
    - synthetic rubbers
- polyisoprenes**
  - RT ∞ polymers
    - rubber
    - synthetic rubbers
- polymer alloys*
  - USE **polymer blends**
- polymer blends**
  - (added November 1992)
  - UF *polyblends*
    - polymer alloys*
  - GS mixtures
    - . **polymer blends**
  - RT copolymers
    - polymer physics
    - ∞ polymers
    - thermoplastic resins
- polymer chemistry**
  - RT biopolymer denaturation
    - ∞ chemistry
    - glass transition temperature
    - oligomers
    - phosphazene
    - polymer physics
    - ∞ polymers
    - polywater
- polymer matrix composites**
  - DEF Materials consisting of reinforcing fibers, filaments, and/or whiskers embedded in polymeric bonding matrices for increased mechanical and physical properties.
    - GS composite materials
      - . **polymer matrix composites**
      - . . epoxy matrix composites
        - . . . boron-epoxy composites
        - . . . graphite-epoxy composites
        - . . . graphite-polyimide composites
      - . . reinforced plastics
        - . . . carbon fiber reinforced plastics
        - . . . carbon-phenolic composites
        - . . . glass fiber reinforced plastics
        - . . . micarta
    - RT aramid fiber composites
      - bismaleimide
      - boron fibers
      - ∞ construction materials
        - fiber composites
        - hybrid composites
        - laminates
      - ∞ materials
      - ∞ matrices
        - matrix materials
        - nanocomposites
        - PEEK
      - ∞ polymers
        - pultrusion
        - resin film infusion
        - resin matrix composites
        - resin transfer molding
        - sheet molding compounds
- polymer physics**
  - RT glass transition temperature
    - ∞ physics
    - polymer blends
    - polymer chemistry
    - ∞ polymers
    - polywater
    - ∞ science
- polymerase chain reaction**
  - (added August 2004)
  - DEF In vitro methods for producing large amounts of specific DNA or RNA fragments of defined length and sequence from small amounts of short oligonucleotide flanking sequences (primers). The essential steps include thermal denaturation of the double-stranded target molecule, annealing of the primers to their

## polymeric films

complementary sequences, and extension of the annealed primers by enzymatic synthesis with DNA polymerase.

- GS in vitro methods and tests
  - . **polymerase chain reaction**
- RT biochemistry
  - deoxyribonucleic acid
  - genetic engineering
  - oligonucleotides

### polymeric films

- UF *plastic films*
- GS **polymeric films**
  - . Kapton (trademark)
  - . Mylar (trademark)
- RT casting
  - conducting polymers
  - fibers
- ∞ films
  - Langmuir-Blodgett films
  - Nylon (trademark)
  - photographic film
  - plastic coatings
  - polypyrroles
- ∞ sheets

### polymerization

DEF A chemical reaction in which the molecules of monomers are linked together to form polymers.

- GS synthesis (chemistry)
  - . **polymerization**
  - . . copolymerization
  - . . dimerization
- RT chemical reactions
  - coupled modes
  - cycloaddition
  - depolymerization
  - electrochemical synthesis
  - oligomers
  - quinoxalines
  - refining
- ∞ setting
  - Ziegler catalyst
  - zwitterions

### ∞ polymers

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT biopolymers
  - block copolymers
  - cellophane
  - conducting polymers
  - coordination polymers
  - copolymerization
  - copolymers
  - dendrimers
  - elastomers
  - electroactive polymers
  - ferroelectric materials
  - fluoropolymers
  - formica
  - glycidyl azide polymer
  - high polymers
  - Kapton (trademark)
  - KEL-F
  - Lexan (trademark)
  - lignin
  - macromolecules
  - methyl polysiloxanes
  - micarta
  - monomers
  - Mylar (trademark)
  - nitrogen polymers
  - Nylon (trademark)
  - oligomers
  - oligonucleotides
  - organic materials
  - organometallic polymers
  - oxetane polymers
  - phosphorus polymers
  - photopolymers
  - plastics
  - polyacrylonitrile
  - polycarbonates
  - polyesters
  - polyethylene terephthalate
  - polyisoprenes
  - polymer blends

polymer chemistry  
polymer matrix composites  
polymer physics  
polyquinoxalines  
polysilanes  
polysiloxanes  
polytetrafluoroethylene  
polyurethane foam  
polyvinyl fluoride  
prepolymers  
Pyrrones (trademark)  
silicon polymers  
silicones  
siloxanes  
solithanes  
styrofoam (trademark)  
synthetic resins  
teflon (trademark)  
vinyl copolymers  
vinyl polymers

### polymethyl methacrylate

- UF *lucite (trademark)*
  - . *plexiglass (trademark)*
- GS plastics
  - . synthetic resins
  - . . polyether resins
  - . . . **polymethyl methacrylate**
  - resins
    - . synthetic resins
    - . . polyether resins
    - . . . **polymethyl methacrylate**
  - vinyl polymers
    - . **polymethyl methacrylate**

### polymorphism

- GS morphology
  - . **polymorphism**
- RT allotropy
  - crystal lattices
  - crystal structure
- ∞ physical properties

### polynomials

- GS algebra
  - . **polynomials**
  - . . binomials
  - . . dyadics
  - . . Hermitian polynomial
- RT coefficients
  - cubic equations
  - eigenvalues
  - eigenvectors
- ∞ equations
  - linear equations
  - nonlinear equations
  - quadratic equations
  - roots of equations
  - shape functions

### polynuclear organic compounds

DEF Hydrocarbon molecules with two or more nuclei and with or without oxygen, nitrogen, or other elements.

- GS organic compounds
  - . **polynuclear organic compounds**
- RT air pollution
  - ∞ chemical compounds
  - petroleum products
  - purification

### polynucleotides

DEF Linear sequences of esters of nucleotides and phosphoric acid.

- GS organic compounds
  - . nucleotides
  - . . **polynucleotides**
  - phosphorus compounds
    - . phosphates
    - . . **polynucleotides**
- RT biopolymers
  - proteins
  - ribonucleic acids

### polynyas

(added July 2001)  
DEF Large areas of open water surrounded by sea ice.

- UF *ice clearings*
- GS clearings (openings)

. **polynyas**  
RT air sea ice interactions

- Antarctic regions
- Arctic Ocean
- ocean surface
- polar regions
- sea ice
- surface water

### polyorganosiloxanes

USE **polysiloxanes**

### Polyot satellites

GS artificial satellites

- . **Polyot satellites**

### polypeptides

DEF In organic chemistry, chains of amino acids linked by peptide bonds but with lower molecular weights than proteins; obtained by synthesis or by partial hydrolysis of proteins.

- GS organic compounds
  - . peptides
  - . . **polypeptides**
  - . . . angiotensins
  - . . . glutathione
  - . . . hypertensin
- RT amino acids
  - biopolymers
  - proteins

### polyphenyl ether

GS ethers

- . **polyphenyl ether**

### polyphenyls

GS phenyls

- . **polyphenyls**
- . . tetraphenyls
- . . triphenyls

### polypropylene

GS plastics

- . **polypropylene**

RT addition resins  
synthetic resins

### polypyrroles

(added August 1994)  
UF *PPY*  
RT conducting polymers  
electrode materials  
polymeric films  
pyrroles

### polyquinoxalines

RT ∞ chemical compounds  
∞ polymers

### polysaccharides

GS biopolymers

- . **polysaccharides**
- . . cellulose
- . . . Fortisan (trademark)
- . . chitin
- . . dextrans
- . . glycogens
- . . starches

organic compounds

- . carbohydrates
- . . **polysaccharides**
- . . . cellulose
- . . . . Fortisan (trademark)
- . . . chitin
- . . . dextrans
- . . . glycogens
- . . . starches

RT gums (substances)

### polysilanes

(added July 1991)  
UF *oxosilanes*  
GS silicon polymers

- . **polysilanes**
- . . polycarbosilanes

RT organometallic polymers  
∞ polymers  
silanes

### polysiloxanes

(added July 1991)

- UF *polyorganosiloxanes*  
 GS silicon polymers  
 . silicones  
 . . **polysiloxanes**  
 . . . methyl polysiloxanes  
 RT ∞ polymers  
 silicon compounds  
 siloxanes
- polyslips**  
 RT ∞ slip
- polystation doppler tracking system**  
 GS networks  
 . tracking networks  
 . . **polystation doppler tracking system**  
 stations  
 . ground stations  
 . . **polystation doppler tracking system**  
 . tracking stations  
 . . **polystation doppler tracking system**  
 tracking (position)  
 . **polystation doppler tracking system**  
 RT Doppler radar  
 missile tracking  
 pulse radar  
 radar networks  
 satellite doppler positioning  
 space detection and tracking system  
 spacecraft tracking  
 ∞ systems
- polystyrene**  
 GS plastics  
 . **polystyrene**  
 . . styrofoam (trademark)  
 styrenes  
 . **polystyrene**  
 . . styrofoam (trademark)  
 vinyl polymers  
 . **polystyrene**  
 . . styrofoam (trademark)  
 RT addition resins  
 block copolymers  
 Santowax (trademark)  
 synthetic resins  
 thermoplastic resins
- polysulfides**  
 GS chalcogenides  
 . sulfides  
 . . inorganic sulfides  
 . . . **polysulfides**  
 sulfur compounds  
 . sulfides  
 . . inorganic sulfides  
 . . . **polysulfides**  
 RT composite propellants
- polytetrafluoroethylene**  
 GS halogen compounds  
 . fluorine compounds  
 . . fluoro compounds  
 . . . difluoro compounds  
 . . . . **polytetrafluoroethylene**  
 . . . . . teflon (trademark)  
 . . . . fluorine organic compounds  
 . . . . fluorohydrocarbons  
 . . . . . **polytetrafluoroethylene**  
 . . . . . . teflon (trademark)  
 . . . . fluoropolymers  
 . . . . . **polytetrafluoroethylene**  
 . . . . . . teflon (trademark)  
 organic compounds  
 . fluorine organic compounds  
 . . fluorohydrocarbons  
 . . . **polytetrafluoroethylene**  
 . . . . teflon (trademark)  
 . . . fluoropolymers  
 . . . . **polytetrafluoroethylene**  
 . . . . . teflon (trademark)  
 . hydrocarbons  
 . . fluorohydrocarbons  
 . . . **polytetrafluoroethylene**  
 . . . . teflon (trademark)  
 plastics
- . **polytetrafluoroethylene**  
 . . teflon (trademark)  
 RT ∞ polymers  
 synthetic resins
- polytopes**  
 RT analytic geometry  
 Euclidean geometry  
 hyperplanes  
 polygons  
 polyhedrons
- polytropic processes**  
 RT adiabatic conditions  
 ∞ isobars  
 thermodynamics
- polyurethane foam**  
 RT foams  
 low density materials  
 ∞ polymers  
 soils  
 sponges (materials)
- polyurethane resins**  
 GS resins  
 . **polyurethane resins**  
 RT composite propellants
- polyvinyl alcohol**  
 GS hydroxyl compounds  
 . alcohols  
 . . **polyvinyl alcohol**  
 plastics  
 . **polyvinyl alcohol**  
 vinyl polymers  
 . **polyvinyl alcohol**  
 RT addition resins  
 synthetic resins
- polyvinyl chloride**  
 UF *Geon (trademark)*  
 GS plastics  
 . **polyvinyl chloride**  
 vinyl polymers  
 . **polyvinyl chloride**  
 RT addition resins  
 chlorides  
 synthetic resins  
 tetrahydrofuran
- polyvinyl fluoride**  
 DEF DuPont's Tedlar, unplasticized PVF films with outstanding resistance to ultraviolet radiation. Used for Tedlar (trademark).  
 UF *Tedlar (trademark)*  
 GS halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . **polyvinyl fluoride**  
 . . . fluoro compounds  
 . . . fluorine organic compounds  
 . . . . fluoropolymers  
 . . . . . **polyvinyl fluoride**  
 . . . . halides  
 . . . . fluorides  
 . . . . **polyvinyl fluoride**  
 organic compounds  
 . fluorine organic compounds  
 . . fluoropolymers  
 . . . **polyvinyl fluoride**  
 plastics  
 . **polyvinyl fluoride**  
 vinyl polymers  
 . **polyvinyl fluoride**  
 RT ∞ polymers
- polyvinylidene*  
 (added December 1997)  
 USE **vinylidene**
- polywater**  
 GS water  
 . **polywater**  
 RT atomic structure  
 chemical bonds  
 molecular structure  
 polymer chemistry
- polymer physics
- Pomeranchuk theorem**  
 GS theorems  
 . **Pomeranchuk theorem**  
 RT antiparticles  
 deuterons  
 diffraction patterns  
 eikonal equation  
 elastic scattering  
 electrons  
 elementary particles  
 field theory (physics)  
 Fredholm equations  
 Glauber theory  
 high energy interactions  
 kaons  
 mesons  
 nucleon-nucleon scattering  
 pomerons  
 Regge poles  
 scattering cross sections
- pomerons**  
 RT nuclear reactions  
 Pomeranchuk theorem  
 proton-proton reactions  
 Regge poles  
 scattering  
 scattering cross sections
- ponderomotive forces**  
 GS electromotive forces  
 . **ponderomotive forces**  
 RT electrostatics  
 ∞ force  
 Lorentz force  
 relativistic plasmas  
 relativity
- ponds**  
 DEF Natural bodies of standing fresh water occupying small surface depressions, usually smaller than lakes and larger than pools.  
 RT aquifers  
 Great Salt Lake (UT)  
 irrigation  
 lagoons  
 lakes  
 limnology  
 liquid wastes  
 reservoirs  
 solar ponds (heat storage)  
 surface water  
 waste disposal  
 water resources  
 watersheds  
 windpowered pumps
- Pontiac (MI)**  
 GS cities  
 . **Pontiac (MI)**  
 RT Michigan
- pontryagin principle**  
 RT calculus of variations  
 maximum principle  
 optimization  
 reaction time
- Population I stars**  
 (added May 2002)  
 DEF Young stars formed from matter of previous generations of stars (Population II stars), and having significant amounts of heavier elements. They are particularly concentrated in the interstellar dust of the arms of spiral galaxies.  
 GS celestial bodies  
 . stars  
 . . **Population I stars**  
 RT B stars  
 interstellar matter  
 irregular galaxies  
 O stars  
 open clusters  
 Population II stars
- Population II stars**  
 (added May 2002)



## Population III stars

DEF Old, low-metallicity stars up to 15 billion years in age found in globular clusters, elliptical galaxies, and the bulges and halos of spiral galaxies.

- GS celestial bodies
  - . stars
  - . . **Population II stars**
- RT elliptical galaxies
  - galactic halos
  - globular clusters
  - horizontal branch stars
  - Population I stars

### Population III stars

- (added July 1999)
- UF *primordial stars*
- GS celestial bodies
  - . stars
  - . . **Population III stars**
- RT cosmology
  - dark matter
  - relic radiation
  - stellar evolution
  - supermassive stars

### population inversion

- GS inversions
  - . **population inversion**
- RT electron pumping
  - energy levels
  - molecular relaxation
  - nitrogen lasers
  - nuclear pumping
  - populations
  - stimulated emission

### population theory

- RT populations
  - probability theory
- ∞ theories

### populations

- RT adults
  - biomass
  - discriminant analysis (statistics)
  - geographic distribution
  - population inversion
  - population theory
  - predators
- ∞ statistics

### porcelain

- GS ceramics
  - . **porcelain**
  - refractory materials
  - . **porcelain**
- RT ceramic coatings
  - enamels
  - glass
  - glazes
  - silicon dioxide
  - vitreous materials
  - vitrification

### pores

USE **porosity**

### porosity

DEF The volume fraction of voids contained in a solid, often expressed as a percent.

- UF *pores*
- GS **porosity**
  - . microporosity
- RT aquifers
  - buoyancy
  - compressibility
  - defects
- ∞ density
  - density (mass/volume)
  - formations
  - gas injection
  - hole distribution (mechanics)
  - hygral properties
  - impregnating
  - infiltration
  - interstices
  - leakage
  - moisture resistance
  - permeability
  - permeating

- pinholes
- porous boundary layer control
- porous materials
- porous plates
- porous silicon
  - ∞ properties
  - sintering
  - textures
  - void ratio
  - voids
  - wettability

### porous airfoils

USE **porous boundary layer control**

### porous boundary layer control

- UF *porous airfoils*
- GS boundary layer control
  - . **porous boundary layer control**
- RT ∞ control
  - convective flow
  - Ekman layer
  - free convection
  - holes (mechanics)
  - mass transfer
  - perforated plates
  - porosity
  - wings

### porous materials

- GS **porous materials**
  - . porous silicon
- RT aerogels
  - brittle materials
- ∞ cells
  - honeycomb structures
  - interstices
  - low density materials
- ∞ materials
  - metal powder
  - porosity
  - powder metallurgy
  - sands
  - soils
  - sponges (materials)
  - xerogels

### porous plates

- GS structural members
  - . plates (structural members)
  - . . **porous plates**
- RT low density materials
  - porosity

### porous silicon

- (added September 1995)
- GS chemical elements
  - . metalloids
  - . . silicon
  - . . . **porous silicon**
  - porous materials
  - . **porous silicon**
- RT cathodoluminescence
  - conduction bands
  - electroluminescence
  - light sources
  - photoluminescence
  - porosity

### porous walls

- GS walls
  - . **porous walls**
- RT ∞ diffusers

### porphines

- GS organometallic compounds
  - . **porphines**
- RT chlorophylls
  - hemoglobin

### porphyra

- GS plants (botany)
  - . algae
  - . . **porphyra**

### porphyrins

- GS **porphyrins**
  - . chlorophylls

RT hemoglobin

### porpoises

- GS animals
  - . vertebrates
  - . . mammals
  - . . . marine mammals
  - . . . . **porpoises**

### portable equipment

- RT ∞ equipment
  - lixiscopes
  - logistics
  - mobility
  - stowage (onboard equipment)

### portable life support systems

- UF *PLSS*
- GS support systems
  - . life support systems
  - . . **portable life support systems**
  - . . . AEPS
  - . . . IMLSS
- RT argon-oxygen atmospheres
  - biopaks
  - breathing apparatus
  - emergency life sustaining systems
  - helium-oxygen atmospheres
  - oxygen masks
  - pressure suits
- ∞ systems

### Portevin-le Chatelier effect

- (added August 1997)
- DEF A discontinuous yielding in crystalline solids characterized by a serrated or step-like deformation curve.
- UF *PLC effect*
- RT crystal dislocations
  - deformation
- ∞ effects
  - strain rate
  - stress-strain diagrams
  - stress-strain relationships

∞ **ports**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT airports
  - deepwater terminals
  - drydocks
  - harbors
  - ports (openings)
  - shipyards
  - wharves

### ports (openings)

- GS openings
  - . **ports (openings)**
- RT apertures
  - cavities
  - ducts
  - exhaust systems
  - orifices
  - outlets
- ∞ ports
  - vents
- ∞ windows
  - windows (apertures)

### Portugal

- GS nations
  - . **Portugal**
  - . . Azores
- RT Europe
  - Portuguese space program

### Portuguese space program

- (added August 1990)
- GS programs
  - . space programs
  - . . European space programs
  - . . . **Portuguese space program**
- RT Portugal

### Poseidon missiles

- GS missiles
  - . ballistic missiles
  - . . **Poseidon missiles**
  - . surface to surface missiles

. . fleet ballistic missiles  
 . . . **Poseidon missiles**  
 RT ballistic missile submarines  
 guided missile submarines  
 sea launching  
**Poseidon satellite**  
 GS artificial satellites  
 . French satellites  
 . . **Poseidon satellite**  
 RT TOPEX  
 ∞ **position**  
 SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)  
 RT attitude (inclination)  
 position (location)  
 position (title)  
**position (location)**  
 UF *localization*  
*location*  
 GS **position (location)**  
 . solar position  
 RT altitude  
 astrolabes  
 azimuth  
 bearing (direction)  
 collating  
 collocation  
 coordinates  
 detection  
 distance  
 ephemerides  
 exposure  
 ∞ fixing  
 geometry  
 latitude  
 longitude  
 misalignment  
 navigation  
 orbital position estimation  
 ∞ orientation  
 ∞ points  
 ∞ position  
 position errors  
 position sensing  
 positioning  
 radar beacons  
 sites  
 sound ranging  
 spatial distribution  
 spherical coordinates  
 stations  
 surveys  
 tracking (position)  
**position (title)**  
 RT employee relations  
 evaluation  
 ∞ grade  
 personnel  
 ∞ position  
 ratings  
**position errors**  
 GS errors  
 . **position errors**  
 . . boresight error  
 RT astrolabes  
 error signals  
 navigation  
 optical correction procedure  
 orbit determination  
 orbital position estimation  
 position (location)  
 positioning  
 velocity errors  
**position indicators**  
 GS display devices  
 . **position indicators**  
 . . plan position indicators  
 . . radio direction finders  
 . . spacecraft position indicators  
 measuring instruments  
 . indicating instruments  
 . . **position indicators**  
 . . . plan position indicators  
 . . . radio direction finders

. . . spacecraft position indicators  
 RT aircraft instruments  
 altimeters  
 beacons  
 distance measuring equipment  
 flight instruments  
 Global Positioning System  
 head-up displays  
 navigation aids  
 navigation instruments  
 plotters  
 position sensing  
 range finders  
 rocket-borne instruments  
 sextants  
 solar compasses  
 sound localization

**position sensing**

RT computer vision  
 electro-optics  
 position (location)  
 position indicators  
 robotics

**positioning**

GS **positioning**  
 . formation flying  
 . satellite doppler positioning  
 . stationkeeping  
 RT adjusting  
 alignment  
 ambiguity  
 collating  
 collocation  
 displacement  
 distributing  
 ∞ distribution  
 exposure  
 fitting  
 ∞ fixing  
 Global Positioning System  
 GLONASS  
 instrument orientation  
 ∞ joining  
 latitude measurement  
 longitude measurement  
 look angles (electronics)  
 navigation  
 ∞ orientation  
 ply orientation  
 position (location)  
 position errors  
 radio navigation  
 relocation  
 ∞ setting  
 spacing

**positioning devices (machinery)**

GS **positioning devices (machinery)**  
 . booms (equipment)  
 . cams  
 . jigs  
 RT ∞ devices  
 holders  
 jacks (lifts)  
 ∞ machinery  
 slewing

**positive feedback**

DEF Feedback which results in increasing  
 the amplification. Used for regenerative feed-  
 back.  
 UF *regenerative feedback*  
 GS feedback  
 . **positive feedback**  
 RT amplification  
 feedback amplifiers  
 multivibrators  
 nonlinear feedback  
 oscillators  
 regeneration (engineering)  
 self oscillation  
 transfer functions

**positive ions**

DEF Group of atoms which has acquired a  
 positive electric charge by the loss of one or  
 more electrons.  
 GS ions

. **positive ions**  
 . . cations  
 . . . formyl ions  
 . . . vanadyl radical  
 . . hydronium ions  
 RT atoms  
 hydrogen ions  
 ion density (concentration)  
 ionic mobility  
 ionospheric ion density  
 magnetospheric ion density  
 metal ions  
 molecular ions  
 monatomic molecules  
 polyatomic molecules  
 protons  
 trivalent ions  
 valence

**positron annihilation**

UF *electron-positron annihilation*  
 GS annihilation reactions  
 . **positron annihilation**  
 RT antiparticles  
 electron-positron pairs  
 elementary particles  
 matter-antimatter propulsion  
 nuclear particles  
 pair production  
 particles

**positronium**

RT atoms  
 excitons

**positrons**

DEF Subatomic particles which are identical  
 to electrons in atomic mass, theoretical rest  
 mass, and energy, but opposite in sign.  
 GS antimatter  
 . antiparticles  
 . . **positrons**  
 particles  
 . charged particles  
 . . **positrons**  
 . elementary particles  
 . . antiparticles  
 . . . **positrons**  
 . . fermions  
 . . leptons  
 . . . **positrons**  
 . nuclear particles  
 . . antiparticles  
 . . . **positrons**  
 RT electron-positron pairs  
 electron-positron plasmas  
 pair production

**post boost propulsion system**

RT ascent trajectories  
 propulsion  
 propulsion system configurations  
 rocket engines  
 spacecraft propulsion  
 ∞ systems  
 trajectory control

**postamplifiers**

GS amplifiers  
 . **postamplifiers**  
 RT preamplifiers

**post-blast nuclear radiation**

GS nuclear radiation  
 . **post-blast nuclear radiation**  
 RT fallout  
 half life  
 radiant flux density  
 ∞ radiation  
 radiation effects  
 radioactive decay  
 radioactivity  
 Vela satellites

**posterior sections**

RT anatomy  
 dorsal sections

**postflight analysis**

RT ∞ analyzing

## postlaunch reports

- ∞ performance
- postmission analysis (spacecraft)

### postlaunch reports

DEF Memoranda issued following spacecraft launchings to report launch data, the launch vehicle performance, orbital elements (expected and measured), and current status.

- GS documents
- . **postlaunch reports**
- reports
- . **postlaunch reports**

- RT prelaunch summaries
- spacecraft launching
- spacecraft performance
- summaries

### postmission analysis (spacecraft)

DEF A broader term than postflight analysis which deals with the scientific aspects of a mission.

- RT flight tests
- postflight analysis

### postulates

- USE **axioms**

### posture

- GS **posture**
- . head down tilt
- . head up tilt
- RT human body
- orthostatic tolerance
- physical fitness

### potable liquids

- GS liquids
- . **potable liquids**
- . beverages
- . . . wines
- . . . potable water
- RT purity

### potable water

- GS liquids
- . potable liquids
- . . **potable water**
- water
- . **potable water**
- RT cold water
- conservation
- consumables (spacecrew supplies)
- drought
- fresh water
- ground water
- limnology
- Modular Integrated Utility System
- oases
- purification
- sanitation
- springs (water)
- water management
- water resources
- water tables
- water treatment

### potassium

- GS chemical elements
- . alkali metals
- . . **potassium**
- . . . liquid potassium
- . . . potassium isotopes
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- metals
- . alkali metals
- . . **potassium**
- . . . liquid potassium
- . . . potassium isotopes
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- RT electrolyte metabolism
- keep

### potassium 38

- GS chemical elements
- . alkali metals
- . . potassium

- . . . potassium isotopes
- . . . . **potassium 38**
- . nuclides
- . isotopes
- . . . potassium isotopes
- . . . . **potassium 38**
- . . . radioactive isotopes
- . . . . **potassium 38**
- metals
- . alkali metals
- . . potassium
- . . . potassium isotopes
- . . . . **potassium 38**

### potassium 39

- GS chemical elements
- . alkali metals
- . . potassium
- . . . potassium isotopes
- . . . . **potassium 39**
- . nuclides
- . isotopes
- . . . potassium isotopes
- . . . . **potassium 39**
- metals
- . alkali metals
- . . potassium
- . . . potassium isotopes
- . . . . **potassium 39**

### potassium 40

- GS chemical elements
- . alkali metals
- . . potassium
- . . . potassium isotopes
- . . . . **potassium 40**
- . nuclides
- . isotopes
- . . . potassium isotopes
- . . . . **potassium 40**
- . . . radioactive isotopes
- . . . . **potassium 40**
- metals
- . alkali metals
- . . potassium
- . . . potassium isotopes
- . . . . **potassium 40**

### potassium alloys

- GS alloys
- . **potassium alloys**

### potassium bromides

- GS halogen compounds
- . bromine compounds
- . . bromides
- . . . **potassium bromides**
- . halides
- . . bromides
- . . . **potassium bromides**
- . . metal halides
- . . . **potassium bromides**
- potassium compounds
- . **potassium bromides**

### potassium channels (biology)

- (added August 2002)
- USE **ion channels (biology)**

### potassium chlorides

- GS halogen compounds
- . chlorine compounds
- . . chlorides
- . . . **potassium chlorides**
- . halides
- . . chlorides
- . . . **potassium chlorides**
- . . metal halides
- . . . **potassium chlorides**
- potassium compounds
- . **potassium chlorides**

### potassium chromates

- GS chromium compounds
- . chromates
- . . **potassium chromates**
- potassium compounds

### . potassium chromates

### potassium compounds

- GS **potassium compounds**
- . alum
- . nepheline
- . potassium bromides
- . potassium chlorides
- . potassium chromates
- . potassium hydrides
- . potassium hydroxides
- . potassium iodides
- . potassium nitrates
- . potassium oxides
- . potassium perchlorates
- . potassium peroxides
- . potassium phosphates
- . potassium silicates
- RT ∞ alkali metal compounds
- ∞ chemical compounds
- ∞ metal compounds

### potassium hydrides

- GS hydrogen compounds
- . hydrides
- . . metal hydrides
- . . . **potassium hydrides**
- potassium compounds
- . **potassium hydrides**

### potassium hydroxides

- GS bases (chemical)
- . alkalies
- . . **potassium hydroxides**
- hydroxides
- . **potassium hydroxides**
- potassium compounds
- . **potassium hydroxides**

### potassium iodides

- GS halogen compounds
- . halides
- . . metal halides
- . . . alkali halides
- . . . . **potassium iodides**
- . iodine compounds
- . . iodides
- . . . **potassium iodides**
- potassium compounds
- . **potassium iodides**

### potassium isotopes

- GS chemical elements
- . alkali metals
- . . potassium
- . . . **potassium isotopes**
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- . nuclides
- . isotopes
- . . . **potassium isotopes**
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40
- metals
- . alkali metals
- . . potassium
- . . . **potassium isotopes**
- . . . . potassium 38
- . . . . potassium 39
- . . . . potassium 40

### potassium nitrates

- GS nitrogen compounds
- . nitrates
- . . inorganic nitrates
- . . . **potassium nitrates**
- potassium compounds
- . **potassium nitrates**

### potassium oxides

- GS chalcogenides
- . oxides
- . . metal oxides
- . . . **potassium oxides**
- potassium compounds

- . **potassium oxides**
- potassium perchlorates**
  - GS halogen compounds
    - . chlorine compounds
    - . . perchlorates
    - . . . **potassium perchlorates**
  - potassium compounds
    - . **potassium perchlorates**
  - RT explosives
    - solid rocket propellants
- potassium peroxides**
  - GS chalcogenides
    - . oxides
    - . . anhydrides
    - . . . peroxides
    - . . . . **potassium peroxides**
  - potassium compounds
    - . **potassium peroxides**
- potassium phosphates**
  - GS phosphorus compounds
    - . phosphates
    - . . **potassium phosphates**
  - potassium compounds
    - . **potassium phosphates**
- potassium silicates**
  - GS potassium compounds
    - . **potassium silicates**
  - silicon compounds
    - . silicates
    - . . **potassium silicates**
  - RT minerals
- potatoes**
  - GS farm crops
    - . **potatoes**
  - plants (botany)
    - . **potatoes**
  - vegetables
    - . **potatoes**
  - RT ∞ food
- ∞ **potential**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT Coulomb potential
    - electric potential
    - geopotential
    - ionization potentials
    - Klein-Dunham potential
    - myoelectric potentials
    - nucleon potential
    - open circuit voltage
    - plasma potentials
    - potential energy
    - potential fields
    - potential theory
    - Yukawa potential
- potential energy**
  - DEF Energy possessed by a body by virtue of its position in a gravity field in contrast with kinetic energy, that possessed by virtue of its motion.
  - GS **potential energy**
    - . electric potential
    - . . bioelectric potential
    - . . contact potentials
    - . . Coulomb potential
    - . . high voltages
    - . . Lienard potential
    - . . low voltage
    - . . open circuit voltage
    - . . photovoltages
    - . . quantum wells
    - . . . photoexcitation
    - . . spike potentials
    - . . threshold voltage
    - . geopotential height
    - . ionization potentials
    - . nuclear potential
    - . plasma potentials
  - RT chemical energy
    - electric energy storage
    - embedded atom method
  - ∞ energy
    - energy storage
- Froude number
- geopotential
- internal energy
- kinetic energy
- Lagrangian function
- Morse potential
- ∞ potential
- potential fields**
  - RT field theory (physics)
    - ∞ potential
- potential flow**
  - UF *irrotational flow*
  - GS fluid flow
    - . **potential flow**
    - . . equipotentials
  - RT Cartan space
    - heat transmission
    - inviscid flow
    - vorticity
- potential gradients**
  - DEF In general, the local space rate of change of any potential, as the gravitational potential gradient or the velocity potential gradient.
  - GS gradients
    - . **potential gradients**
  - RT pressure gradients
    - spark gaps
    - temperature gradients
- potential theory**
  - RT differential equations
    - Jacobi integral
    - Lennard-Jones potential
  - ∞ potential
    - stream functions (fluids)
  - ∞ theories
- ∞ **potentiometers**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF Instruments for measuring differences in electric potential by balancing the unknown voltage against a variable known voltage. If the balancing is accomplished automatically, the instrument is called a self-balancing potentiometer. A variable electric resistor.
    - RT potentiometers (instruments)
    - potentiometers (resistors)
- potentiometers (instruments)**
  - GS measuring instruments
    - . **potentiometers (instruments)**
  - RT bolometers
    - electric potential
    - electrical measurement
    - electrometers
  - ∞ potentiometers
    - thermocouple pyrometers
    - thermocouples
    - voltmeters
- potentiometers (resistors)**
  - GS attenuators
    - . resistors
    - . . **potentiometers (resistors)**
  - RT ∞ potentiometers
- potentiometric analysis**
  - UF *potentiometry*
  - GS chemical tests
    - . chemical analysis
    - . . **potentiometric analysis**
- potentiometry*
  - USE **potentiometric analysis**
- Potez aircraft**
  - RT ∞ aircraft
- Potomac River Valley (MD-VA-WV)**
  - GS valleys
    - . **Potomac River Valley (MD-VA-WV)**
  - RT District of Columbia
    - Maryland
    - Virginia
- West Virginia
- potting compounds**
  - RT ∞ compounds
    - encapsulating
    - insulation
- pouring**
  - RT casting
    - castings
- powder (particles)**
  - DEF An aggregate of discrete particles that are usually within the size range 1 to 1,000 mm.
  - GS particles
    - . **powder (particles)**
    - . . fines
    - . . metal powder
    - . . . platinum black
    - . . . powdered aluminum
    - . . . . sintered aluminum powder
  - RT compressibility
    - crop dusting
    - dust
    - explosives
    - flakes
    - flour (food)
    - granular materials
    - obsidian
    - pumice
    - size separation
- powder metallurgy**
  - DEF The art of producing metal powders and of the utilization of metal powders for the production of massive materials and shaped objects.
    - RT alloying
      - alloys
      - autoclaving
      - cermets
      - combustion synthesis
      - comminution
      - compacting
      - composite materials
      - electrodeposition
      - liquid phase sintering
      - low density materials
      - metal matrix composites
      - metal particles
      - metal powder
    - ∞ metallurgy
      - mixed crystals
      - porous materials
      - preforms
      - reaction bonding
      - sintered aluminum powder
      - sintering
      - vacuum melting
- powdered aluminum**
  - GS particles
    - . metal particles
    - . . metal powder
    - . . . **powdered aluminum**
    - . . . . sintered aluminum powder
    - . powder (particles)
    - . . metal powder
    - . . . **powdered aluminum**
    - . . . . sintered aluminum powder
  - RT aluminum
    - lithium aluminum hydrides
- powdered metals*
  - USE **metal powder**
- ∞ **power**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT electric generators
    - fluid power
    - flux (rate)
    - flux density
    - horsepower
    - resolution
    - thrust
- power amplifiers**
  - GS amplifiers
    - . **power amplifiers**

## power beaming

RT amplidyne  
cyclotron resonance devices  
feedback amplifiers  
magnetic amplifiers  
parametric amplifiers  
push-pull amplifiers  
transistor amplifiers  
traveling wave amplifiers

### power beaming

(added November 1989)

UF *beamed power*  
GS **power beaming**  
. laser power beaming  
. microwave power beaming  
. satellite power transmission  
RT energy conversion  
laser propulsion  
microwave transmission  
∞ power transmission  
solar power satellites  
spacecraft power supplies

### power conditioning

UF *power processing systems*  
RT ∞ conditioning  
electric current  
electric generators  
electric potential  
energy conversion  
energy conversion efficiency  
output  
satellite solar energy conversion  
satellite solar power stations

### power converters

RT ∞ converters  
torque converters

### power density (electromagnetic)

USE **radiant flux density**

### power efficiency

GS efficiency  
. **power efficiency**  
RT combustion efficiency  
compressor efficiency  
exergy  
horsepower  
nozzle efficiency  
power factor controllers  
∞ power loss  
propeller efficiency  
propulsion system performance  
propulsive efficiency  
thermodynamic efficiency  
transmission efficiency

### power factor controllers

DEF A solid state electronic device that reduces excess energy waste in AC induction motors by providing only the amount of voltage required to satisfy a given load.

GS controllers  
. **power factor controllers**  
RT current regulators  
electric motors  
energy conservation  
energy conversion efficiency  
induction motors  
power efficiency  
voltage regulators

### power gain

DEF The ratio of the power that a transducer delivers to a specified load, under specified operating conditions, to the power absorbed by its input circuit. Of an antenna, in a given direction, 4 pi times the ratio of the radiation intensity in that direction to the total power delivered to the antenna.

GS amplification  
. **power gain**  
RT CATT devices  
high gain

open circuit voltage

### power generators

USE **electric generators**

### power law bodies

(added May 1995)

GS symmetrical bodies  
. axisymmetric bodies  
. . **power law bodies**  
. bodies of revolution  
. . **power law bodies**  
RT blunt bodies  
slender bodies

### power limited spacecraft

RT ∞ spacecraft

### power limiters

RT attenuators  
clamping circuits  
clipper circuits  
limiter circuits

### power lines

GS transmission lines  
. **power lines**  
RT bus conductors  
∞ cables  
coaxial cables  
electric power transmission  
electric wire  
submarine cables  
superconducting power transmission  
underground transmission lines

### ∞ power loss

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT energy dissipation  
power efficiency

### power modules (STS)

DEF Modules for providing power for payloads for STS and mission dependent equipment.

GS modules  
. **power modules (STS)**  
RT orbital maneuvering vehicles  
payload delivery (STS)  
solar arrays  
space transportation system  
spacecraft power supplies

### ∞ power plants

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cogeneration  
electric power plants  
engines  
Enrico Fermi atomic power plant  
geothermal energy utilization  
Hallam Nuclear Power Facility  
hydroelectric power stations  
hydroelectricity  
ML-1 nuclear power plant  
solar sea power plants  
solar thermal electric power plants

### power processing systems

USE **power conditioning**

### power reactors

RT nuclear power reactors  
∞ reactors  
saturable reactors

### power series

GS analysis (mathematics)  
. calculus  
. . series (mathematics)  
. . . **power series**  
. . . . Taylor series  
. . . . . Maclaurin series  
. real variables  
. . series (mathematics)  
. . . **power series**  
. . . . Taylor series  
. . . . . Maclaurin series  
RT analytic functions

Bessel functions

### power spectra

GS spectra  
. **power spectra**  
. . cepstra  
RT acoustics  
cepstral analysis  
energy spectra  
flux density  
loudness  
maximum entropy method

### ∞ power supplies

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aircraft engines  
aircraft power supplies  
auxiliary power sources  
electric batteries  
electric generators  
electric power supplies  
electron sources  
energy requirements  
heat sources  
lead acid batteries  
line current  
lithium sulfur batteries  
nuclear auxiliary power units  
plasma power sources  
propellants  
rectifiers  
solar generators  
spacecraft power supplies  
voltage converters (AC to AC)  
voltage converters (DC to DC)

### power supply circuits

GS circuits  
. **power supply circuits**  
RT current regulators  
rectifiers  
transformers  
voltage converters (DC to DC)  
voltage regulators

### ∞ power transmission

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT bus conductors  
electric outlets  
electric power transmission  
electrical engineering  
electrification  
hydroelectric power stations  
mechanical drives  
power beaming  
windmills (windpowered machines)

### power transmission (lasers)

USE **laser power beaming**

### power transmission (microwave)

USE **microwave power beaming**

### powered lift aircraft

RT ∞ aircraft  
externally blown flaps  
short takeoff aircraft  
STOVL aircraft  
vertical takeoff aircraft

### powered models

SN (LIMITED TO TEST FACILITIES)  
DEF Models that can be tested in complete force equilibrium, including propulsion.  
GS models  
. wind tunnel models  
. . **powered models**  
RT aircraft models  
dynamic models

### Poynting theorem

GS theorems  
. **Poynting theorem**  
RT ∞ electric power  
electromagnetic radiation  
energy transfer  
Maxwell equation

vector analysis

**Poynting-Robertson effect**

DEF The gradual decrease in orbital velocity of a small particle such as a micrometeorite in orbit about the sun due to the absorption and remission of radiant energy by the particle.

RT ∞ effects  
micrometeoroids  
orbital mechanics  
radiation effects  
zodiacal dust  
zodiacal light

PPI (*position indicators*)USE **plan position indicators**PPM (*modulation*)USE **pulse position modulation**PPT (*rocket engines*)*(added April 2001)*USE **pulsed plasma thrusters**

PPY

USE **polypyrrroles***practices*USE **procedures****Praesepe star clusters**

GS celestial bodies  
. star clusters  
. . open clusters  
. . . **Praesepe star clusters**  
. stars  
. . **Praesepe star clusters**  
RT ∞ clusters

**praetersonic devices**

RT microwave frequencies  
piezoelectric transducers  
thin films  
ultrahigh frequencies

*prairies*USE **grasslands****Prandtl number**

DEF A dimensionless number representing the ratio of momentum transport to heat transport in a flow. (After Ludwig Prantl, 1875-1953, German scientist).

GS dimensionless numbers  
. **Prandtl number**  
ratios  
. **Prandtl number**  
RT forced convection  
Grashof number  
heat transfer  
inviscid flow  
momentum transfer  
Nusselt number  
Pecllet number  
Reynolds number  
Schmidt number  
thermodynamic properties  
viscous flow

**Prandtl-Meyer expansion**

GS expansion  
. **Prandtl-Meyer expansion**  
RT Blasius equation  
Falkner-Skan equation  
flow deflection  
laminar flow  
method of characteristics  
Newton pressure law  
supersonic flow  
two dimensional flow

**praseodymium**

GS chemical elements  
. rare earth elements  
. . **praseodymium**  
. . . praseodymium isotopes  
metals  
. rare earth elements  
. . **praseodymium**  
. . . praseodymium isotopes  
RT didymium

praseodymium compounds

*praseodymium 144*USE **praseodymium isotopes****praseodymium compounds**

*(added August 1990)*  
GS rare earth compounds  
. **praseodymium compounds**  
RT ∞ chemical compounds  
∞ metal compounds  
praseodymium

**praseodymium isotopes**

UF *praseodymium 144*  
GS chemical elements  
. nuclides  
. . isotopes  
. . . **praseodymium isotopes**  
. rare earth elements  
. . praseodymium  
. . . **praseodymium isotopes**  
metals  
. rare earth elements  
. . praseodymium  
. . . **praseodymium isotopes**

**preamplifiers**

DEF Amplifiers, the primary function of which is to raise the output of a low level source to an intermediate level so that the signal may be further processed without appreciable degradation in the signal-to-noise ratio. In radar amplifiers separated from the remainder of the receiver and located so as to provide the shortest possible input circuit path from the antenna so as to avoid deterioration of the signal-to-noise ratio. Used for preselectors.

UF *preselectors*  
GS amplifiers  
. **preamplifiers**  
RT intermediate frequency amplifiers  
low noise  
mixing circuits  
postamplifiers  
signal detection  
signal detectors  
signal reception  
transistor amplifiers  
voltage amplifiers

**preburners**

GS pressure vessels  
. **preburners**  
RT pumps  
turbine pumps

**Precambrian period**

RT Baltic Shield (Europe)  
Cambrian Period  
Canadian Shield  
geology  
paleontology  
Paleozoic Era

*precautions*USE **accident prevention****precession**

DEF Change in the direction of the axis of rotation of a spinning body, as a gyro, when acted upon by a torque.

GS gyration  
. **precession**  
. . Larmor precession  
. . proton precession  
. . quenching (atomic physics)  
RT coning motion  
Earth orientation  
gyroscopes  
gyroscopic stability  
Larmor radius  
libration  
muon spin rotation  
nutation  
polar wandering (geology)  
retrograde orbits  
rotation

vortex precession

*precious metals*USE **noble metals****precipitates**

SN (EXCLUDES METEOROLOGICAL PRECIPITATES)  
RT alloys  
grain boundaries  
microstructure  
precipitation (chemistry)  
precipitation hardening  
reaction products

∞ **precipitation**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERM LISTED BELOW)  
RT drop size  
electron precipitation  
falling  
hydrometallurgy  
materials recovery  
particle precipitation  
precipitation (chemistry)  
precipitation (meteorology)  
proton precipitation

**precipitation (chemistry)**

DEF The separation of a new phase from solid or liquid solution, usually with changing conditions of temperature or pressure or both.

RT agglomeration  
cementation  
∞ chemistry  
coagulation  
colloiding  
concentrating  
crystallization  
deposition  
dissolving  
filtration  
flocculating  
hydrometallurgy  
materials recovery  
Ostwald ripening  
precipitates  
∞ precipitation  
precipitators  
∞ saturation  
saturation (chemistry)  
∞ separation  
settling  
solubility  
supersaturation  
unsaturation (chemistry)

**precipitation (meteorology)**

DEF The precipitation of water from the atmosphere in the form of hail, mist, rain, sleet, and snow. Deposits of dew, fog, and frost are excluded.

GS **precipitation (meteorology)**  
. graupel  
. hail  
. rain  
. . acid rain  
. snow  
. snow cover  
RT Alpine meteorology  
anvil clouds  
atmospheric moisture  
CALIPSO (Pathfinder satellite)  
cap clouds  
cirrocumulus clouds  
cirrostratus clouds  
climatology  
cloud physics  
cloud seeding  
clouds (meteorology)  
CloudSat  
cumulonimbus clouds  
cyclones  
dew  
drainage patterns  
drought  
flood damage  
flood predictions  
floods  
fog

## precipitation hardening

- fog dispersal
- hailstorms
- humidity
- hydrological cycle
- hydrology
- hydrology models
- hydrometeorology
- hydrometeors
- International Hydrological Decade
- meteorological parameters
- meteorology
- mist
- monsoons
- nephanalysis
- nimbostratus clouds
- ∞ precipitation
- precipitation measurement
- rainmaking
- rainstorms
- ∞ saturation
- snowstorms
- storm damage
- storm enhancement
- storm suppression
- storms
- storms (meteorology)
- water
- water resources
- watersheds
- weather
- weather forecasting

### precipitation hardening

- UF *age hardening*  
*dispersion precipitation hardening*  
*strain aging*
- GS hardening (materials)
  - . **precipitation hardening**
  - . . maraging
- RT cold hardening  
eutectic composites  
heat treatment  
precipitates  
solid solutions  
strain hardening  
supersaturation  
time temperature parameter

### precipitation measurement

(added June 2003)

DEF Techniques and processes used to measure the amount and type of precipitation.

- RT ∞ measurement  
meteorological instruments  
meteorological radar  
meteorological satellites  
precipitation (meteorology)  
rain  
rain gages  
snow

### precipitation particle measurement

- GS size determination
  - . **precipitation particle measurement**
- RT drop size  
meteorological radar  
particle size distribution  
particles

### precipitators

- GS separators
  - . **precipitators**
  - . . electrostatic precipitators
- RT air filters  
concentrators  
dust collectors  
precipitation (chemistry)  
thickeners (equipment)

### precision

DEF The quality of being exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. Used for exactness.

- UF *exactness*
- RT accuracy  
allowances

- confidence limits
- consistency
- definition
- dynamic characteristics
- errors
- geometric dilution of precision
- high resolution
- hysteresis
- quality
- quality control
- reliability
- resolution
- schedules
- sensitivity
- ∞ sharpness
- tolerances (mechanics)
- truncation errors
- validity

### precision guided projectiles

- DEF Missiles guided by precise laser radiation.
- GS missiles
  - . **precision guided projectiles**
  - projectiles
  - . **precision guided projectiles**
  - weapons
  - . guns (ordnance)
  - . . artillery
  - . . . **precision guided projectiles**
  - . warheads
  - . . **precision guided projectiles**
- RT ∞ bombs  
terminal ballistics

### preconditioning

- GS preparation
  - . **preconditioning**
- RT ∞ conditioning

### precooling

- GS cooling
  - . **precooling**
- RT regenerative cooling

### predators

- RT animals  
ecology  
ecosystems  
populations

### predicate calculus

(added September 1993)

- GS mathematical logic
  - . **predicate calculus**
- RT artificial intelligence
  - ∞ logic
  - theorem proving

### predicate logic

(added September 1993)

- RT artificial intelligence  
linguistics
  - ∞ logic
  - programming languages
  - semantics

### prediction analysis techniques

- GS scheduling
  - . **prediction analysis techniques**
- RT ∞ analyzing  
parameter identification  
performance prediction  
system identification  
trend analysis

### prediction recording

- GS recording
  - . **prediction recording**
- RT predictions

### predictions

- UF *predictors*
- GS **predictions**
  - . flood predictions
  - . impact prediction
  - . linear prediction
  - . noise prediction
  - . . noise prediction (aircraft)
  - . forecasting

- . performance prediction
- . Roshko prediction
- . . technological forecasting
- . . . Delphi method (forecasting)
- . . . pattern method (forecasting)
- . . . probe method (forecasting)
- . . . profile method (forecasting)
- . . weather forecasting
- . . . long range weather forecasting
- . . . nowcasting
- . . . numerical weather forecasting
- . . . statistical weather forecasting
- . hindcasting
- RT catastrophe theory  
confidence limits  
contingency  
estimates  
maximum likelihood estimates  
mission planning  
prediction recording
- ∞ projection  
risk  
risk assessment  
schedules

### predictor-corrector methods

- GS analysis (mathematics)
  - . numerical analysis
  - . . approximation
  - . . . **predictor-corrector methods**
  - . . iteration
  - . . . **predictor-corrector methods**
- RT differential equations  
iterative solution

### predictors

- USE **predictions**

### preempting

- RT claiming  
prevention

### prefiring tests

- GS engine tests
  - . **prefiring tests**
- RT captive tests  
checkout  
ground tests  
preflight analysis  
prelaunch tests  
rocket engine design  
space vehicle checkout program  
static tests  
test firing  
test stands
- ∞ tests

### preflight analysis

- RT ∞ analyzing  
prefiring tests  
systems analysis
- ∞ tests  
trajectory analysis  
weight analysis

### preflight operations

- GS **preflight operations**
  - . aircraft runup
  - . countdown
- RT crew procedures (preflight)  
flight operations  
ground tests
- ∞ operations  
prelaunch tests  
refueling

### prefocusing

- GS focusing
  - . **prefocusing**
- RT ∞ optics

### preforms

- RT blanks  
composite materials  
molds  
powder metallurgy  
resin film infusion

- resin transfer molding
- pregnancy**  
RT birth
- preheaters*  
USE **heating equipment**
- preheating*  
USE **heating**
- pre-Imbrian period**  
DEF One of four stratigraphic classifications adopted for displaying (on maps) the geological ages of major features on the moon.  
RT lunar composition  
lunar craters  
lunar evolution  
lunar geology  
lunar rocks
- preimpregnation**  
RT filament winding  
pultrusion
- prejudices**  
RT economics  
irrationality  
management  
∞ properties  
psychology
- prelaunch problems**  
RT countdown  
∞ problems  
reliability  
spacecraft reliability
- prelaunch summaries**  
DEF Summaries prior to launch of the preparations and parameters of the mission.  
GS summaries  
. **prelaunch summaries**  
RT mission planning  
postlaunch reports  
spacecraft launching
- prelaunch tests**  
GS ground tests  
. **prelaunch tests**  
. . static firing  
RT captive tests  
cold flow tests  
countdown  
crew procedures (preflight)  
engine tests  
launching  
missile tests  
prefiring tests  
preflight operations  
spacecraft maintenance  
static tests  
test firing  
test stands  
∞ tests
- preloading*  
USE **prestressing**
- pre-main sequence stars**  
DEF Stars in which nuclear reactions that take place in its core have not yet occurred.  
GS celestial bodies  
. stars  
. . protostars  
. . . **pre-main sequence stars**  
. . . . T Tauri stars  
RT main sequence stars  
star formation  
stellar evolution
- premature operation**  
RT ∞ operations  
preparation
- premixed flames**  
GS flames  
. **premixed flames**  
RT carburetors  
flame propagation  
gas mixtures
- mixing  
premixing  
reacting flow  
turbulent combustion  
turbulent flames
- premixing**  
DEF The mixing of ingredients prior to a specified action (mixing of fuel and air prior to ignition in combustion, for example).  
GS mixing  
. **premixing**  
RT fuel-air ratio  
fuels  
gas mixtures  
homogenizing  
ignition  
jet mixing flow  
premixed flames  
spraying
- preparation**  
GS **preparation**  
. preconditioning  
. pretreatment  
. . prestressing  
. prewhirling  
. prewhitening  
RT assembling  
premature operation  
∞ priming
- prepolymers**  
DEF Polymers of degrees of polymerization between that of the monomer or monomers, and the final polymer.  
GS **prepolymers**  
. dimers  
. trimers  
RT monomers  
∞ polymers
- prepregs**  
DEF The reinforcing materials containing or combined with the full complement or resin before molding operations in the production of composite materials.  
RT composite materials  
epoxy resins  
functionally gradient materials  
laminates  
resin matrix composites
- preprocessing**  
RT data processing  
data reduction  
image processing
- presbyopia**  
RT vision
- preselectors*  
USE **preamplifiers**
- presentation**  
RT information
- preservatives**  
RT additives  
∞ agents  
anticoagulants  
antioxidants  
neutralizers  
penetrants  
preserving  
retardants  
stabilizers (agents)
- preserving**  
GS food processing  
. **preserving**  
RT biopaks  
∞ containers  
corrosion prevention  
coverings  
curing  
degradation  
dehydrated food  
∞ food  
freeze drying
- freezing  
frozen foods  
impregnating  
irradiation  
packaging  
preservatives  
radiation effects  
refrigerating  
∞ storage  
weatherproofing
- Presidential reports**  
DEF Formal reports originated by the President or his office.  
GS documents  
. **Presidential reports**  
reports  
. **Presidential reports**  
RT congressional reports  
papers  
records
- presintering*  
USE **sintering**
- presses**  
GS **presses**  
. rams (presses)  
RT compacting  
hammers  
machine tools  
platens  
∞ pressing  
pressing (forming)  
punches  
tools
- ∞ **pressing**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cold pressing  
compacting  
compressing  
hot isostatic pressing  
hot pressing  
platens  
presses  
pressing (forming)
- pressing (forming)**  
GS forming techniques  
. **pressing (forming)**  
. . blanking (cutting)  
. . coining  
. . hot pressing  
. . stamping  
. . . hot isostatic pressing  
RT cold pressing  
compacting  
extruding  
forging  
metal working  
molds  
presses  
∞ pressing  
pultrusion  
sizing (shaping)  
upsetting
- pressoreceptor reflexes*  
(added March 2001)  
USE **baroreflexes**
- pressoreceptors*  
(added March 2001)  
USE **baroreceptors**
- pressors*  
USE **vasoconstrictor drugs**
- pressure**  
DEF Force or load per unit area. Used for surface pressure.  
UF *surface pressure*  
GS **pressure**  
. atmospheric pressure  
. base pressure  
. blood pressure  
. . diastolic pressure  
. . hypertension



**pressure breathing**

- . . hypotension
- . . lower body negative pressure
- . . systolic pressure
- . critical pressure
- . densification
- . differential pressure
- . dynamic pressure
- . fluid pressure
- . . water pressure
- . gas pressure
- . geopressure
- . high pressure
- . inlet pressure
- . internal pressure
- . intracranial pressure
- . intraocular pressure
- . isostatic pressure
- . low pressure
- . . high altitude pressure
- . middle ear pressure
- . overpressure
- . partial pressure
- . . oxygen tension
- . . . hypoxemia
- . plasma pressure
- . radiation pressure
- . . electron pressure
- . . lumens
- . . luminous intensity
- . . . illuminance
- . . . luminance
- . . sound pressure
- . stagnation pressure
- . static pressure
- . . hydrostatic pressure
- . supercritical pressures
- . thrust chamber pressure
- . transient pressures
- . transition pressure
- . vacuum
- . . high vacuum
- . . low vacuum
- . . ultrahigh vacuum
- . vapor pressure
- . wall pressure
- . wind pressure
- RT baroreceptors
- blast loads
- center of pressure
- compressing
- ear pressure test
- elastic waves
- environments
- ∞ force
- fuel tank pressurization
- Gibbs-Helmholtz equations
- head (fluid mechanics)
- high pressure oxygen
- impact
- isobars (pressure)
- loads (forces)
- Newton pressure law
- osmosis
- pressure breathing
- pressure broadening
- pressure chambers
- pressure distribution
- pressure drag
- ∞ pressure drop
- pressure effects
- pressure gages
- pressure gradients
- pressure heads
- pressure ice
- pressure measurement
- pressure modulator radiometers
- pressure oscillations
- pressure pulses
- pressure ratio
- pressure recorders
- pressure recovery
- pressure reduction
- pressure sensors
- pressure suits
- pressure vessel design
- pressure vessels
- pressure welding
- pressurized cabins
- pressurized water reactors

- pressurizing
- temperature inversions
- vacuum chambers
- weight (mass)
- pressure breathing**
- DEF The breathing of oxygen or a suitable mixture of gases at a pressure higher than the surrounding pressure.
- GS respiration
- . **pressure breathing**
- RT emergency breathing techniques
- liquid breathing
- pressure
- stress (physiology)
- pressure broadening**
- RT line spectra
- pressure
- spectroscopy
- pressure cabins*
- USE **pressurized cabins**
- pressure chambers**
- GS compartments
- . test chambers
- . . **pressure chambers**
- . . . hyperbaric chambers
- . . . vacuum chambers
- RT air locks
- ∞ chambers
- enclosures
- pressure
- pressurized cabins
- wind tunnel drives
- pressure dependence**
- DEF Study of how a rate constant changes with pressure.
- RT burning rate
- hydrostatic pressure
- reaction kinetics
- pressure distribution**
- UF *pressure fields*
- GS distribution (property)
- . **pressure distribution**
- RT aerodynamic coefficients
- aerodynamic loads
- aerodynamic stability
- center of pressure
- differential pressure
- ∞ distribution
- field theory (physics)
- influence coefficient
- internal pressure
- isobars (pressure)
- lift
- loading moments
- loads (forces)
- manometers
- mass distribution
- moment distribution
- Newton pressure law
- pressure
- ∞ pressure drop
- shock wave profiles
- spanwise blowing
- static loads
- structural design criteria
- Theodorsen transformation
- thrust distribution
- velocity distribution
- vertical distribution
- wall pressure
- pressure drag**
- GS dynamic characteristics
- . drag
- . . **pressure drag**
- . . . supersonic drag
- . . . wave drag
- . . . . interference drag
- RT aerodynamic drag
- friction drag

- pressure
- ∞ **pressure drop**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT fluid power
- friction
- gas flow
- head flow
- inlet flow
- pressure
- pressure distribution
- pressure gradients
- pressure oscillations
- pressure reduction
- two phase flow
- pressure effects**
- RT beta factor
- compressibility effects
- ∞ effects
- jet blast effects
- loads (forces)
- nonisothermal processes
- pressure
- suction
- temperature effects
- temperature inversions
- transition pressure
- vacuum effects
- wind effects
- pressure fields*
- USE **pressure distribution**
- pressure gages**
- UF *bombs (pressure gages)*
- GS measuring instruments
- . **pressure gages**
- . . barometers
- . . manometers
- . . osmometers
- . . piezoelectric gages
- . . piezometers
- . . vacuum gages
- . . . ionization gages
- . . . . alphatrons
- . . . . Bayard-Alpert ionization gages
- . . . . Penning gages
- . . . . Philips ionization gages
- . . . Knudsen gages
- . . . McLeod gages
- . . . Pirani gages
- RT ∞ bombs
- Bourdon tubes
- flowmeters
- hypsometers
- pressure
- shock measuring instruments
- strain gage accelerometers
- strain gage balances
- strain gages
- weight indicators
- pressure gradients**
- GS gradients
- . **pressure gradients**
- RT atmospheric pressure
- bathythermographs
- boundary layer thickness
- critical flow
- differential pressure
- fluid boundaries
- fluid flow
- friction factor
- geopressure
- hydrodynamics
- hydrostatics
- inlet pressure
- isobars (pressure)
- Knudsen flow
- liquid flow
- liquid-liquid interfaces
- liquid-vapor interfaces
- multiphase flow
- orifice flow
- pipe flow
- potential gradients
- pressure

- ∞ pressure drop
- Rankine-Hugoniot relation
- steady flow
- steam flow
- subcritical flow
- suction
- supercritical flow
- uniform flow
- unsteady flow
- Venturi tubes

**pressure heads**

- UF *head (pressure)*
- GS fluid flow
  - . head (fluid mechanics)
  - . . **pressure heads**
- RT center of pressure
  - elevation
- ∞ hydraulics
- hydrodynamics
- hydrostatic pressure
- hydrostatics
- liquid flow
- pressure

**pressure ice**

- UF *pressure ridges*
- GS ice
  - . sea ice
  - . . **pressure ice**
- RT cold weather
  - freezing
  - ice formation
  - low temperature
  - ocean currents
  - pressure
  - tides
  - wind (meteorology)
  - winter

**pressure measurement**

- UF *tonometry*
- GS mechanical measurement
  - . **pressure measurement**
- RT barometers
  - Bourdon tubes
  - differential pressure
  - flow measurement
  - flowmeters
  - ionization gages
  - Knudsen gages
  - manometers
  - McLeod gages
- ∞ measurement
  - noise meters
  - Philips ionization gages
  - Pirani gages
  - pitot tubes
  - pneumatic probes
  - pressure
  - pressure sensitive paints
  - vacuum
  - vacuum gages
  - velocity
  - velocity measurement
  - Venturi tubes
  - weight indicators
  - wind tunnel calibration
  - wind tunnel tests

**pressure modulator radiometers**

DEF A cell containing a known quantity of a gas is placed in the single optical path of the radiometer and subjected to cyclical pressure changes which alter the absorption lines in the infrared spectrum of the gas. A narrow band signal results from the different voltages at the detector at high and low cell pressures. A wide-band signal is generated by physically chopping a percentage of the input beam with a rotating chopper blade.

- GS measuring instruments
  - . radiation measuring instruments
  - . . actinometers
  - . . . radiometers
  - . . . . **pressure modulator radiometers**
- RT infrared radiometers

pressure

**pressure oscillations**

- GS oscillations
  - . **pressure oscillations**
- RT acoustic frequencies
  - combustion stability
  - flame propagation
  - pressure
- ∞ pressure drop
  - Southern Oscillation
  - turbulent flow

*pressure probes*

USE **pressure sensors**

**pressure pulses**

- GS pulses
  - . **pressure pulses**
- RT blast loads
  - flame propagation
  - pressure
  - shock waves

**pressure ratio**

DEF The relationship of a force to the deformation of a system whose deformation varies in some proportion to the force.

- GS ratios
  - . **pressure ratio**
- RT fuel-air ratio
  - lift drag ratio
  - mass ratios
  - payload mass ratio
  - pressure
  - propellant mass ratio
  - stress ratio
  - thrust-weight ratio

**pressure recorders**

- GS recording instruments
  - . **pressure recorders**
- RT pressure

**pressure recovery**

- RT ∞ diffusers
  - explosive decompression
  - fluid amplifiers
  - inlet pressure
  - pressure
- ∞ recovery

**pressure reduction**

- UF *bleed-off*
  - decompression*
  - deflating*
  - depressurization*
- GS **pressure reduction**
  - . explosive decompression
- RT ∞ bleeding
  - compressing
  - gas expansion
  - inflating
  - pressure
- ∞ pressure drop
- ∞ reduction

**pressure regulators**

- GS control equipment
  - . regulators
  - . . automatic control valves
  - . . . **pressure regulators**
  - . . . valves
  - . . . automatic control valves
  - . . . **pressure regulators**
- RT controllers
  - flow regulators
  - fuel tank pressurization
  - oxygen regulators
  - pressurizing
  - relief valves

*pressure ridges*

USE **pressure ice**

**pressure sensitive paints**

(added March 2001)

DEF Luminescent paints used for the non-intrusive optical measurement of static and transient pressure fields. These paints are typically

organic luminophores or dyes dispersed in an oxygen permeable polymeric binder. The luminescence is induced by the excitation of the dye with an appropriate wavelength light. The emitted intensity or brightness of the paint is inversely proportional to the partial pressure of oxygen because the luminescence is quenched by oxygen.

- UF *PSP (paints)*
- GS coatings
  - . paints
  - . . **pressure sensitive paints**
- RT flow measurement
  - flow visualization
  - nonintrusive measurement
  - optical measurement
  - pressure measurement

**pressure sensors**

- UF *pressure probes*
- GS *pressure transducers*
  - transducers
  - . **pressure sensors**
  - . . Bourdon tubes
- RT electroacoustic waves
  - piezoelectric gages
  - pressure
  - quartz transducers
- ∞ rakes
  - shock wave generators
  - transient pressures
  - transient response
  - ultrasonic wave transducers

**pressure suits**

DEF Garments designed to provide pressure upon the body so that the respiratory and circulatory functions may continue normally, or nearly so, under low pressure conditions, such as occur at high altitudes or in space without benefit of pressurized cabins.

- GS clothing
  - . protective clothing
  - . . **pressure suits**
  - . . . space suits
  - . . . . extravehicular mobility units
  - . suits
  - . . **pressure suits**
  - . . . space suits
  - . . . . extravehicular mobility units
- RT flight clothing
  - helmets
  - inflatable structures
  - life support systems
  - portable life support systems
  - pressure
  - safety devices

**pressure switches**

- GS control equipment
  - . **pressure switches**
  - switches
  - . **pressure switches**
- RT electric switches

*pressure transducers*

USE **pressure sensors**

**pressure vessel design**

- GS structural design
  - . **pressure vessel design**
- RT ∞ design
  - perforated shells
  - pressure
  - shells (structural forms)

**pressure vessels**

- GS **pressure vessels**
  - . preburners
- RT accumulators
  - autoclaves
  - bells
  - boilers
  - bulbs
  - burst tests
- ∞ containers
  - domes (structural forms)
  - fuel tank pressurization
  - fuel tanks
  - hemisphere cylinder bodies

## pressure welding

isotenoid structures  
pressure  
propellant tanks  
reactor materials  
shallow shell equations  
spherical tanks  
storage tanks  
tanks (containers)  
∞ vessels  
wall pressure  
wind tunnel walls

*pressure waves*

USE **elastic waves**

### pressure welding

GS welding  
. **pressure welding**  
. . cold welding  
. . diffusion welding  
. . explosive welding  
. . friction welding  
. . friction stir welding  
. . ultrasonic welding  
RT arc welding  
electric welding  
flash welding  
fusion welding  
gas welding  
pressure  
spot welds

### pressurized cabins

UF *pressure cabins*  
GS compartments  
. **pressurized cabins**  
RT aircraft compartments  
cabin atmospheres  
∞ cabins  
cockpits  
emergency life sustaining systems  
environmental control  
escape capsules  
explosive decompression  
life support systems  
oxygen supply equipment  
pressure  
pressure chambers  
spacecraft cabin atmospheres  
spacecraft cabins

### pressurized water reactors

GS nuclear reactors  
. liquid cooled reactors  
. . water cooled reactors  
. . . **pressurized water reactors**  
. . . . spectral shift control reactor  
RT nuclear power reactors  
pressure

### pressurizing

GS **pressurizing**  
. fuel tank pressurization  
RT accumulators  
densification  
expulsion  
expulsion bladders  
gas generators  
gas injection  
inflating  
pressure  
pressure regulators  
stimulation

*Preston tubes*

USE **pitot tubes**  
**speed indicators**

*prestraining*

USE **prestressing**

### prestressing

UF *preloading*  
*prestraining*  
*pretwisting*  
GS preparation  
. pretreatment  
. . **prestressing**  
RT elastic deformation  
isotenoid structures

stresses  
structural strain  
tensegrity structures

*pretests*

USE **tests**

### pretreatment

GS preparation  
. **pretreatment**  
. . prestressing  
RT prevention  
∞ priming

*pretwisting*

USE **prestressing**  
**twisting**

### prevaporization

DEF The phase transformations of liquids to gases prior to some physical or chemical reaction.

GS phase transformations  
. vaporizing  
. . **prevaporization**  
RT flashing (vaporizing)  
gases  
vapor phases  
vapors  
volatility

### prevention

GS **prevention**  
. accident prevention  
. corrosion prevention  
. fire prevention  
. ice prevention  
. preventive maintenance  
RT blocking  
etiology  
∞ inhibition  
pollution  
preempting  
pretreatment  
protection  
∞ reduction  
∞ resistance  
retarding  
sabotage  
safety  
stopping

### preventive maintenance

(*added June 2000*)  
GS maintenance  
. **preventive maintenance**  
prevention  
. **preventive maintenance**  
RT aircraft maintenance  
failure analysis  
inspection  
nondestructive tests  
reliability analysis

### prewhirling

GS preparation  
. **prewhirling**

### prewhitening

GS preparation  
. **prewhitening**  
RT color  
∞ treatment

### Pribram meteorite

GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . chondrites  
. . . . **Pribram meteorite**  
RT bolides  
meteor trails

### primary batteries

SN (NON-RECHARGEABLE BATTERIES)  
GS electric generators  
. direct power generators  
. . **primary batteries**  
. . . alkaline batteries  
. . . dry cells  
. . . . magnesium cells

. . . . nickel zinc batteries  
. . . metal air batteries  
. . . . zinc-oxygen batteries  
. . . sodium sulfur batteries  
. . . thermal batteries  
electrochemical cells  
. electric batteries  
. . **primary batteries**  
. . . alkaline batteries  
. . . dry cells  
. . . . magnesium cells  
. . . . nickel zinc batteries  
. . . metal air batteries  
. . . . zinc-oxygen batteries  
. . . sodium sulfur batteries  
. . . thermal batteries  
RT charge efficiency  
electrolytes  
nonaqueous electrolytes  
storage batteries  
wet cells

### primary cosmic rays

UF *heavy cosmic ray primaries*  
GS extraterrestrial radiation  
. **primary cosmic rays**  
. . solar cosmic rays  
ionizing radiation  
. cosmic rays  
. . **primary cosmic rays**  
. . . solar cosmic rays  
particles  
. corpuscular radiation  
. . **primary cosmic rays**  
. . . solar cosmic rays  
RT cosmic ray albedo  
heavy nuclei  
secondary cosmic rays

### primates

GS animals  
. vertebrates  
. . mammals  
. . . **primates**  
. . . . apes  
. . . . . chimpanzees  
. . . . . baboons  
. . . . human beings  
. . . . monkeys

### ∞ primers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT engine primers  
primers (coatings)  
primers (explosives)

### primers (coatings)

DEF Coatings designed to enhance adhesion.  
GS coatings  
. protective coatings  
. . **primers (coatings)**  
RT dopes  
fillers  
finishes  
lacquers  
metal coatings  
paints  
∞ primers  
sprayed coatings  
substrates  
varnishes

### primers (explosives)

GS explosive devices  
. initiators (explosives)  
. . **primers (explosives)**  
igniters  
. initiators (explosives)  
. . **primers (explosives)**  
RT caps (explosives)  
detonation  
detonators  
exploding wires  
percussion  
∞ primers

- squibs
- ∞ **priming**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT coating  
coatings  
initiation  
preparation  
pretreatment  
starting
- primitive Earth atmosphere**
- GS Earth atmosphere  
. **primitive Earth atmosphere**
- RT ∞ atmospheres  
atmospheric composition  
atmospheric electricity  
atmospheric models  
Earth planetary structure  
free atmosphere  
paleoclimatology  
planetary atmospheres
- primitive equations**
- DEF Eulerian equations of fluid motion in which the primary dependent variables are the fluid's velocity components. The equations govern a wide variety of fluid motions and form the basis of most hydrodynamical analysis.
- RT atmospheric boundary layer  
climatology  
∞ equations  
Euler equations of motion  
fluid dynamics  
∞ mathematics
- primordial galaxies*  
(added May 2002)  
USE **protogalaxies**
- primordial stars*  
(added July 1999)  
USE **Population III stars**
- Prince Edward Island**
- GS landforms  
. islands  
. . **Prince Edward Island**  
nations  
. Canada  
. . **Prince Edward Island**
- Prince William Sound (AK)**
- GS sounds (topographic features)  
. **Prince William Sound (AK)**
- RT Alaska
- Princeton sailwings*  
USE **sailwings**
- principal components analysis**
- RT image processing  
imaging techniques  
Karhunen-Loeve expansion  
pattern recognition  
spectral mixture analysis
- ∞ **principles**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT duality principle  
∞ logic  
∞ mathematics
- printed circuits**
- GS circuits  
. **printed circuits**
- RT breadboard models  
circuit boards  
electronic packaging  
hybrid circuits  
integrated circuits  
large scale integration  
medium scale integration  
miniature electronic equipment  
miniaturization  
photomasks  
subminiaturization  
thick films
- transistor circuits
- printed resistors**
- GS attenuators  
. resistors  
. . **printed resistors**
- RT miniaturization
- printers**
- GS **printers**  
. printers (data processing)  
. teleprinters
- RT cathode ray tubes  
data processing equipment  
plotters  
printing  
projectors  
typewriters
- printers (data processing)**
- GS computer components  
. peripheral equipment (computers)  
. . **printers (data processing)**  
data processing equipment  
. peripheral equipment (computers)  
. . **printers (data processing)**  
printers  
. **printers (data processing)**
- RT automatic typewriters  
computers  
∞ data  
display devices  
printouts  
readout  
teleprinters
- printing**
- GS **printing**  
. lithography  
. . photolithography
- RT binding  
contrast  
document markup languages  
electronic publishing  
electronography  
engraving  
inks  
legibility  
photoengraving  
photographic processing  
photomechanical effect  
plotting  
printers  
reading  
reproduction (copying)  
stencil processes
- printouts**
- RT format  
lists  
output  
printers (data processing)  
readout  
tables (data)
- priorities**
- RT engineering management  
project planning  
research management  
resource allocation  
sequencing
- Priroda module**  
(added August 1995)
- GS modules  
. space station modules  
. . **Priroda module**
- RT Mir space station  
radar imagery  
remote sensing  
space station structures
- prismatic bars**
- GS bars  
. **prismatic bars**
- RT prisms
- prisms**
- DEF Transparent bodies with at least two polished plane faces inclined with respect to
- each other, from which light is reflected or through which light is refracted. When light is refracted by a prism whose refractive index exceeds that of the surrounding medium, it is deviated or bent toward the thicker part of the prism.
- GS optical equipment  
. **prisms**
- RT photoelasticity  
prismatic bars  
refraction
- privacy**
- DEF Freedom from observation and/or intrusion. Applies to such things as communications, personal records, photographs.
- RT computer information security  
information  
information dissemination  
integrity  
papers  
recording  
records  
security
- private aircraft*  
USE **general aviation aircraft**
- probability*  
USE **probability theory**
- probability density functions**
- GS functions (mathematics)  
. **probability density functions**  
. . normal density functions  
. . Pearson distributions  
. . Rayleigh distribution  
. . Weibull density functions  
statistical analysis  
. **probability density functions**  
. . normal density functions  
. . Pearson distributions  
. . Rayleigh distribution  
. . Weibull density functions
- RT binomial theorem  
censored data (mathematics)  
continuity (mathematics)  
discrete functions  
events  
expectancy hypothesis  
exponential functions  
failure analysis  
gas density  
Mills ratio  
quartiles
- probability distribution functions**
- GS functions (mathematics)  
. distribution functions  
. . **probability distribution functions**  
statistical analysis  
. **probability distribution functions**  
statistical distributions  
. **probability distribution functions**
- RT discrete functions  
goodness of fit
- probability theory**
- UF *probability*  
*statistical probability*
- RT ∞ applications of mathematics  
belief networks  
binomial theorem  
Borel sets  
combinatorial analysis  
confidence  
∞ conjunction  
consecutive events  
continuums  
correlation  
decision theory  
distribution functions  
Duffing differential equation  
Einstein equations  
ergodic process  
error analysis  
events  
extremum values  
forecasting  
fuzzy systems

**probe method (forecasting)**

- game theory
- goodness of fit
- ∞ indication
- infinity
- information theory
- iteration
- Kolmogorov-Smirnov test
- likelihood ratio
- martingales
- ∞ mathematics
- ∞ Maxwell-Boltzmann density function
- Minkowski space
- Monte Carlo method
- operations research
- outliers (statistics)
- parameter identification
- population theory
- quality control
- random errors
- random noise
- reliability
- sampling
- statistical analysis
- statistical distributions
- ∞ statistics
- ∞ Stieltjes integral
- stochastic processes
- subgroups
- system identification
- ∞ theories
- transition probabilities
- traveling salesman problem
- uncertain systems
- uniqueness theorem

**probe method (forecasting)**

- GS management methods
  - . **probe method (forecasting)**
  - predictions
  - . forecasting
  - . . . technological forecasting
  - . . . **probe method (forecasting)**
- RT Delphi method (forecasting)
  - estimating
- ∞ methodology
  - operations research
  - pattern method (forecasting)
  - planning
  - profile method (forecasting)
  - technology assessment

∞ **probes**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Galileo probe
  - gas detectors
  - measuring instruments
  - Pioneer 8 space probe
  - Pioneer 9 space probe
  - Pioneer 10 space probe
  - Pioneer 11 space probe
  - Pioneer Venus 1 spacecraft
  - Pioneer Venus 2 entry probes
  - Pioneer Venus 2 night probe
  - Pioneer Venus 2 spacecraft
  - Pioneer Venus 2 transporter bus
  - Pioneer Venus spacecraft
  - radio probing
  - remote sensors
  - sondes
  - space probes
  - transducers

**problem solving**

- GS **problem solving**
  - . alternating direction implicit methods
  - . asymptotic methods
  - . iterative solution
  - . theorem proving
- RT approximation
  - backward differencing
  - computational grids
  - Crank-Nicholson method
  - decision making
  - decision support systems
  - Dining Philosophers Problem
  - existence theorems
  - group dynamics
  - homotropy

- Householder transformations
- ill-conditioned problems
  - (mathematics)
- ill-posed problems (mathematics)
- iteration
- learning theory
- management
- maze learning
- ∞ methodology
  - Newton methods
  - simplex method
- ∞ solution

∞ **problems**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Bolza problems
  - boundary value problems
  - Cauchy problem
  - Chapman-Ferraro problem
  - Dirichlet problem
  - four body problem
  - isoperimetric problem
  - many body problem
  - Mayer problem
  - Neumann problem
  - operational problems
  - Poincare problem
  - prelaunch problems
  - three body problem
  - tracking problem
  - traveling salesman problem
  - two body problem

**procedures**

- DEF Detailed instructions for the performance of a process or function.
- UF *methods*
- practices*
- GS **procedures**
  - . boundary integral method
  - . crew procedures (inflight)
  - . crew procedures (preflight)
  - . finite element method
  - . finite volume method
  - . . . Godunov method
  - . Glimm method
  - . optical correction procedure
  - . panel method (fluid dynamics)
- RT procurement policy
  - systems analysis

*proceedings*

- USE **conferences**
- congressional reports**

**process control (industry)**

- DEF The ways and means by which continuous manufacturing and other industrial processes are monitored and maintained to create products of planned, uniform dimension and quality.
- RT component reliability
  - ∞ control
    - group technology (manufacturing)
    - product development
    - quality control
    - sampling
    - specifications

**process heat**

- DEF Increase in enthalpy accompanying chemical reactions or phase transformations at constant pressure (heat of crystallization and heat of sublimation are examples).
- GS heat
  - . **process heat**
- RT heat generation

∞ **processes**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT autoregressive processes
  - isentropic processes
  - jet membrane process
  - Kraft process (woodpulp)
  - nonisentropy
  - nonisothermal processes
  - Ornstein-Uhlenbeck process

- product development
- quality control
- sol-gel processes
- space industrialization
- Umklapp process

∞ **processing**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT associative processing (computers)
  - batch processing
  - data processing
  - food processing
  - image processing
  - manufacturing
  - materials recovery
  - message processing
  - nuclear fuel reprocessing
  - optical data processing
  - photographic processing
  - production engineering
  - recycling
  - refining
  - retort processing
  - settling
  - signal processing
  - ultrasonic processing
  - wet spinning

*processors (computers)*

- USE **central processing units**

**procurement**

- GS **procurement**
  - . government procurement
  - . leasing
- RT contracts
  - equipment specifications
  - government/industry relations
- ∞ receiving
  - services
  - specifications
  - subcontracts

**procurement management**

- GS management
  - . **procurement management**
- RT allocations
  - budgeting
- ∞ budgets
  - commercial off-the-shelf products
  - commodities
  - federal budgets
  - financial management
  - inventory management
  - products
  - services

**procurement policy**

- GS policies
  - . **procurement policy**
- RT decisions
  - intellectual property
  - management
  - procedures
  - regulations
  - rules

**product development**

- UF *engineering development*
- GS **product development**
  - . weapons development
- RT aircraft design
  - aircraft production
  - amplifier design
  - antenna design
  - breadboard models
  - commerce
  - commercial off-the-shelf products
  - commercialization
  - computer design
  - concurrent engineering
  - consumers
- ∞ design
- ∞ development
  - engine design
  - functional design specifications
  - helicopter design
  - inventions
  - lens design

- management
- market research
- marketing
- patent applications
- patent policy
- pilot plants
- process control (industry)
- ∞ processes
- ∞ production
  - production engineering
  - quality
  - quality control
  - rapid prototyping
  - reactor design
  - reliability
  - satellite design
  - solvent refined coal
  - space industrialization
  - spacecraft design
  - standardization
  - structural design
- ∞ **production**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT aircraft production
  - food production (in space)
  - fuel production
  - output
  - product development
  - production engineering
  - production planning
  - reserves
  - tools
- production costs**
  - DEF The process of fabrication, from raw materials through the finished products, including packaging and other prorated costs.
  - GS costs
    - . **production costs**
    - . . aircraft production costs
  - RT cost analysis
  - cost estimates
  - design to cost
  - life cycle costs
  - operating costs
- production engineering**
  - UF *production methods*
  - GS **production engineering**
    - . group technology (manufacturing)
    - . production planning
  - RT aircraft production
  - aircraft production costs
  - ∞ capacity
  - ∞ engineering
    - human factors engineering
    - laser applications
    - management
    - numerical control
  - ∞ operations
    - planning
  - ∞ processing
    - product development
  - ∞ production
    - productivity
    - products
    - scheduling
    - standardization
- production management**
  - GS management
    - . **production management**
  - RT aircraft production costs
  - employee relations
  - estimates
  - fabrication
  - group technology (manufacturing)
  - industrial management
  - manufacturing
  - quality control
  - reliability
  - resources
  - safety management
- total quality management
- production methods*
- USE **production engineering**
- production planning**
  - GS planning
    - . management planning
    - . . **production planning**
  - production engineering
    - . **production planning**
  - RT ∞ production
    - schedules
- productivity**
  - RT aircraft production costs
  - allowances
  - efficiency
  - matrix management
  - morale
  - production engineering
  - reliability
  - software reuse
  - workstations
- products**
  - GS **products**
    - . fission products
    - . gross national product
    - . petroleum products
      - . . asphalt
      - . . diesel fuels
      - . . gasoline
      - . . tars
    - . reaction products
      - . . combustion products
      - . . . soot
      - . . reaction intermediates
    - . commercial off-the-shelf products
      - . data products
  - RT by-products
  - commodities
  - manufacturing
  - output
  - procurement management
  - production engineering
  - quality control
  - resource allocation
  - services
  - space industrialization
- proficiency*
- USE **abilities**
- profile method (forecasting)**
  - GS management methods
    - . **profile method (forecasting)**
    - predictions
      - . forecasting
      - . . technological forecasting
      - . . . **profile method (forecasting)**
  - RT Delphi method (forecasting)
  - estimating
    - ∞ methodology
    - operations research
    - planning
    - probe method (forecasting)
    - technology assessment
- ∞ **profiles**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT airfoil profiles
  - angles (geometry)
  - curvature
  - delineation
  - distribution (property)
  - geometry
  - gradients
  - line shape
  - platforms
  - profilometers
  - search profiles
  - shapes
  - shock wave profiles
  - slopes
  - streamlining
  - topography
- wind profiles
- profilometers**
  - GS measuring instruments
    - . **profilometers**
  - RT ∞ profiles
    - roughness
    - shapes
    - surface properties
    - surface roughness
- progeny**
  - RT children
  - reproduction (biology)
- prognosis**
  - RT diagnosis
- Prognoz satellites**
  - GS artificial satellites
    - . Soviet satellites
    - . . **Prognoz satellites**
- program evaluation review technique*
- USE **PERT**
- program management*
- USE **project management**
- program reliability (computers)*
- USE **software reliability**
- program trend line analysis**
  - RT critical path method
  - management planning
  - PERT
  - programs
  - project management
- program verification (computers)**
  - RT checkout
  - computer programming
  - file maintenance (computers)
  - proving
  - software development tools
  - software reliability
  - systems analysis
  - ∞ tests
- programmable logic devices**
  - (added September 1992)
  - GS reconfigurable hardware
    - . **programmable logic devices**
    - . . field-programmable gate arrays
  - RT architecture (computers)
  - computer systems design
  - controllers
  - logic circuits
  - logic design
- programmed cell death*
- (added October 2000)
- USE **apoptosis**
- programmed instruction**
  - GS education
    - . **programmed instruction**
    - . . computer assisted instruction
  - RT compilers
  - computer programming
  - computer programs
- programmers**
  - GS personnel
    - . **programmers**
  - RT coders
  - computer programming
  - file maintenance (computers)
- ∞ **programming**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT computer programming
  - dynamic programming
  - file maintenance (computers)
  - linear programming
  - mathematical programming
  - microprogramming
  - multiprogramming
  - nonlinear programming
  - programming (scheduling)

## programming (scheduling)

- quadratic programming
- structured programming

### programming (scheduling)

- GS scheduling
  - . programming (scheduling)
- . thrust programming
- RT critical path method
- ∞ programming
- ∞ steps

### programming environments

- (added January 1993)
- UF SEE (software engineering environments)
  - software engineering environments
- RT computer programming
- computer programs environments
- software development tools
- software engineering

### programming languages

- GS languages
  - . programming languages
  - . ALGOL
  - . APL (programming language)
  - . Assembly language
  - . autocoders
  - . COMPASS (programming language)
  - . MAP (programming language)
  - . BASIC (programming language)
  - . Cobol
  - . COGO (programming language)
  - . context free languages
  - . Forth (programming language)
  - . FORTRAN
  - . HAL/S (language)
  - . high level languages
    - . Ada (programming language)
    - . C (programming language)
    - . C++ (programming language)
    - . Java (programming language)
    - . LISP (programming language)
  - . machine oriented languages
  - . natural language (computers)
  - . Pascal (programming language)
  - . PL/1
  - . Prolog (programming language)
- RT computer programming
- formalism
- predicate logic
- structured programming

### programs

- GS programs
  - . Army-Navy instrumentation program
  - . Comsat program
  - . defense program
  - . Downrange Antimissile Measurement Program
  - . Global Atmospheric Research Program
  - . GARP Atlantic Tropical Experiment
  - . International Geosphere-Biosphere program
  - . lunar programs
    - . Apollo project
    - . Surveyor project
  - . NASA programs
    - . ACEE program
    - . Assess program
    - . ATLIT project
    - . DAST program
    - . NASA space programs
      - . . . Apollo applications program
      - . . . Apollo project
      - . . . Bioastronautical Orbital Space System
        - . . . Centaur project
        - . . . Earth & Ocean Physics Applications Program
        - . . . Earth Resources Program
        - . . . Earth Resources Survey Program
        - . . . . SEASAT program
        - . . . Echo project
        - . . . Galileo project
        - . . . Gemini project

- . . . Helios Project
- . . . Jupiter project
- . . . Magellan project (NASA)
- . . . Mariner program
  - . . . . Mariner Venus-Mercury 1973
  - . . . . Mariner-Mercury 1973
- . . . Mars 69 project
- . . . Mars 71 project
- . . . Mercury project
- . . . National Launch Vehicle Program
- . . . NEW MOONS project
- . . . Nimbus project
- . . . OPEN Project
- . . . Pioneer project
- . . . Project SETI
- . . . Ranger project
  - . . . . Agena B Ranger Program
  - . . . Constellation program
  - . . . Mars Surveyor 98 Program
  - . . . New Horizons mission
- . . . Rover project
- . . . SAIL project
- . . . Saturn project
- . . . Scout project
- . . . Skylab program
- . . . Starprobe mission
- . . . Surveyor project
- . . . Synchronous Communications Satellite Proj
- . . . Tektite project
- . . . TIROS project
- . . . Titan project
- . . . Vanguard project
- . . . Viking Mars program
- . . . Voyager project
- . . . Mission to Planet Earth
- . . . National Aerospace Plane Program
- . . . quiet engine program
- . . . supersonic cruise aircraft research
- . . . TACT program
- . . . Terminal Configured Vehicle Program
- . . . Tilt Rotor Research Aircraft Program
- . . . PANT program
- . . . projects
  - . . . Advent Project
  - . . . AgRISTARS project
  - . . . Alouette project
  - . . . Apollo project
  - . . . Apollo Soyuz test project
  - . . . Argus project
  - . . . ASSET project
  - . . . ATLIT project
  - . . . BIOS project
  - . . . Bumblebee project
  - . . . Centaur project
  - . . . Defender project
  - . . . Earth & Ocean Physics Applications Program
  - . . . Echo project
  - . . . eclipse project
  - . . . Experimental Reflector Orbital Shot Proj
  - . . . FIRE (climatology)
  - . . . Galileo project
  - . . . Gemini project
  - . . . Geosari project
  - . . . Harvard Radio Meteor Project
  - . . . Helios Project
  - . . . ISCCP Project
  - . . . Jupiter project
  - . . . Magellan project (NASA)
  - . . . Mars 69 project
  - . . . Mars 71 project
  - . . . Mercury project
  - . . . NEW MOONS project
  - . . . Nike project
  - . . . Nimbus project
  - . . . OPEN Project
  - . . . Pioneer project
  - . . . Project SETI
  - . . . Radio Attenuation Measurement project
  - . . . rand project
  - . . . Ranger project
  - . . . Agena B Ranger Program
  - . . . CERES (experiment)

- . . Next Generation Space Telescope project
- . . Rover project
- . . SAIL project
- . . Saturn project
- . . Scanner project
- . . Scout project
- . . Seafarer project
- . . SQUID project
- . . Submarine Integrated Control project
- . . Success project
- . . Surface Meteorology and Solar Energy project
- . . Surface Radiation Budget project
- . . Surveyor project
- . . Synchronous Communications Satellite Proj
- . . Telstar project
- . . Themis project
- . . TIROS project
- . . Titan project
- . . Vanguard project
- . . Voyager project
- . . West Ford project
- . radar target scatter site program
- . space programs
  - . . Argentine space program
  - . . Australian space program
  - . . Brazilian space program
  - . . Canadian space program
  - . . Alouette project
  - . . Chinese space program
  - . . European space programs
    - . . . Austrian space program
    - . . . Belgian space program
    - . . . Czechoslovakian space program
    - . . . Danish space program
    - . . . Finnish space program
    - . . . French space program
    - . . . German space program
    - . . . Greek space program
    - . . . Hungarian space program
    - . . . Icelandic space program
    - . . . Italian space program
    - . . . Luxembourg space program
    - . . . Netherlands space program
    - . . . Norwegian space program
    - . . . Portuguese space program
    - . . . Spanish space program
    - . . . Swedish space program
    - . . . Swiss space program
    - . . . Turkish space program
    - . . . UK space program
  - . . . geographic applications program
  - . . . Indian space program
  - . . . Indonesian space program
  - . . . Israeli space program
  - . . . Japanese space program
  - . . . Mexican space program
  - . . . NASA space programs
    - . . . . Apollo applications program
    - . . . . Apollo project
    - . . . . Bioastronautical Orbital Space System
      - . . . . Centaur project
      - . . . . Earth & Ocean Physics Applications Program
      - . . . . Earth Resources Program
      - . . . . Earth Resources Survey Program
      - . . . . . SEASAT program
      - . . . . . Echo project
      - . . . . . Galileo project
      - . . . . . Gemini project
      - . . . . . Helios Project
      - . . . . . Jupiter project
      - . . . . . Magellan project (NASA)
      - . . . . . Mariner program
      - . . . . . Mariner Venus-Mercury 1973
      - . . . . . Mariner-Mercury 1973
      - . . . . . Mars 69 project
      - . . . . . Mars 71 project
      - . . . . . Mercury project
      - . . . . . National Launch Vehicle Program
      - . . . . . NEW MOONS project
      - . . . . . Nimbus project
      - . . . . . OPEN Project
      - . . . . . Pioneer project

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- . . . . Agena B Ranger Program
- . . . Constellation program
- . . . Mars Surveyor 98 Program
- . . . New Horizons mission
- . . . Rover project
- . . . SAIL project
- . . . Saturn project
- . . . Scout project
- . . . Skylab program
- . . . Starprobe mission
- . . . Surveyor project
- . . . Synchronous Communications Satellite Proj
- . . . Tektite project
- . . . TIROS project
- . . . Titan project
- . . . Vanguard project
- . . . Viking Mars program
- . . . Voyager project
- . . New Zealand space program
- . . Pakistan space program
- . . Russian Space Program
- . . Saudi Arabian space program
- . . U.S.S.R. space program
- . . Ukrainian space program
- . Starsite program
- . TRAP program
- . university program
- RT bureaus (organizations)
- Committee on Space Research
- computer program integrity
- computer programs
- Earth Resources Information System
- investigation
- mission planning
- ∞ missions
- ∞ operations
- program trend line analysis
- research and development
- ∞ research projects
- SEASAT 1
- SEASAT satellites
- SEASAT-B satellite
- Solar Maximum Mission
- Synchronous Earth Observatory satellite
- user manuals (computer programs)

**progress**

- RT economics
- management
- planning
- ∞ properties

**progressions**

- GS analysis (mathematics)
- . calculus
- . . series (mathematics)
- . . . **progressions**
- . real variables
- . . series (mathematics)
- . . . **progressions**

**prohibition**

- RT legal liability
- penalties
- policies
- regulations

**project management**

- UF *program management*
- GS management
- . **project management**
- RT commerce
- contract management
- critical path method
- GERT
- interfaces
- management planning
- management systems
- mission planning
- multidisciplinary research
- PERT
- program trend line analysis
- projects
- research and development
- ∞ research projects

weapon system management

**project planning**

- GS planning
- . management planning
- . . **project planning**
- RT allocations
- budgeting
- decisions
- estimates
- forecasting
- goals
- management
- matrix management
- ∞ missions
- NASA Interactive Planning System
- operations research
- priorities
- projects
- risk management

**Project SETI**

DEF A program to search for extraterrestrial intelligence by means of radio communication. Used for Search for Extraterrestrial Intelligence and SETI.

- UF *Search for Extraterrestrial Intelligence SETI*
- GS programs
- . NASA programs
- . . NASA space programs
- . . . **Project SETI**
- . projects
- . . **Project SETI**
- . space programs
- . . NASA space programs
- . . . **Project SETI**
- RT extraterrestrial intelligence
- radio communication
- radio signals

**projectile cratering**

- UF *hypervelocity cratering*
- GS cratering
- . **projectile cratering**
- RT Deep Impact Mission
- ejecta
- hypervelocity impact
- hypervelocity projectiles
- meteorite craters
- meteoritic damage
- meteoroid hazards
- Tempel 1 comet

*projectile penetration*

USE **terminal ballistics**

**projectiles**

DEF Objects, especially missiles, fired, thrown, launched, or otherwise projected in any manner, such as bullets, guided rocket missiles, sounding rockets, or pilotless airplanes. Originally, objects, such as bullets or artillery shells, projected by applied external forces.

- GS **projectiles**
- . hypervelocity projectiles
- . precision guided projectiles
- . Sabot projectiles
- RT ammunition
- ballistics
- bombs (ordnance)
- cartridges
- finned bodies
- gunfire
- guns (ordnance)
- incendiary ammunition
- nuclear weapons
- pyrotechnics
- shaped charges
- shrapnel
- terminal ballistics
- terradyamics
- warheads
- weapons

∞ **projection**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Bonne projection
- descriptive geometry

- drawings
- forecasting
- gnomonic projection
- graphic arts
- illuminating
- magnification
- predictions
- projectors
- trends

**projective geometry**

- GS geometry
- . Euclidean geometry
- . . **projective geometry**
- . . . Mercator projection
- RT analytic geometry
- descriptive geometry
- gnomonic projection
- reciprocal theorems

**projectors**

- SN (LIGHT AND IMAGE)
- RT beacons
- illuminating
- luminaires
- motion pictures
- photogrammetry
- photographic equipment
- photography
- printers
- ∞ projection
- searchlights

**projects**

- GS programs
- . **projects**
- . . Advent Project
- . . AgRISTARS project
- . . Alouette project
- . . Apollo project
- . . Apollo Soyuz test project
- . . Argus project
- . . ASSET project
- . . ATLIT project
- . . BIOS project
- . . Bumblebee project
- . . Centaur project
- . . Defender project
- . . Earth & Ocean Physics Applications Program
- . . Echo project
- . . eclipse project
- . . Experimental Reflector Orbital Shot Proj
- . . FIRE (climatology)
- . . Galileo project
- . . Gemini project
- . . Geosari project
- . . Harvard Radio Meteor Project
- . . Helios Project
- . . ISCCP Project
- . . Jupiter project
- . . Magellan project (NASA)
- . . Mars 69 project
- . . Mars 71 project
- . . Mercury project
- . . NEW MOONS project
- . . Nike project
- . . Nimbus project
- . . OPEN Project
- . . Pioneer project
- . . Project SETI
- . . Radio Attenuation Measurement project
- . . rand project
- . . Ranger project
- . . . Agena B Ranger Program
- . . CERES (experiment)
- . . Next Generation Space Telescope project
- . . Rover project
- . . SAIL project
- . . Saturn project
- . . Scanner project
- . . Scout project
- . . Seafarer project
- . . SQUID project
- . . Submarine Integrated Control project
- . . Success project



## prokaryotes

- . . Surface Meteorology and Solar Energy project
- . . Surface Radiation Budget project
- . . Surveyor project
- . . Synchronous Communications Satellite Proj
- . . Telstar project
- . . Themis project
- . . TIROS project
- . . Titan project
- . . Vanguard project
- . . Voyager project
- . . West Ford project
- RT bureaus (organizations)
- contracts
- estimating
- ∞ missions
- ∞ operations
- project management
- project planning
- ∞ research projects
- tasks
- teams

### prokaryotes

- GS cells (biology)
- . **prokaryotes**
- RT bacteria
- biological evolution
- cytology
- eukaryotes
- molecular biology

### prolate spheroids

- DEF Ellipsoids of revolutions, the longer axis of which is the axis of revolution.
- GS geometry
- . Euclidean geometry
- . . analytic geometry
- . . . spheroids
- . . . **prolate spheroids**
- RT oblate spheroids

### prolateness

- RT shapes

### Prolog (programming language)

- GS languages
- . programming languages
- . . **Prolog (programming language)**
- RT artificial intelligence
- computer programming
- expert systems

### prolongation

- GS extensions
- . **prolongation**
- RT time

### promethazine

- GS drugs
- . antihistaminics
- . . **promethazine**
- organic compounds
- . amines
- . . **promethazine**
- . cyclic compounds
- . . heterocyclic compounds
- . . . **promethazine**

### Prometheus

- (added July 1995)
- DEF A natural satellite of Saturn, orbiting at a mean distance of 139,350 kilometers.
- GS celestial bodies
- . natural satellites
- . . Saturn satellites
- . . . **Prometheus**
- RT Saturn (planet)

### promethium

- GS chemical elements
- . rare earth elements
- . . **promethium**
- . . . promethium isotopes
- metals
- . rare earth elements
- . . **promethium**

- . . . promethium isotopes

### promethium 146

- USE **promethium isotopes**

### promethium isotopes

- UF *promethium 146*
- GS chemical elements
- . nuclides
- . . isotopes
- . . . **promethium isotopes**
- . rare earth elements
- . . promethium
- . . . **promethium isotopes**
- metals
- . rare earth elements
- . . promethium
- . . . **promethium isotopes**

### prominences

- GS **prominences**
- . solar prominences
- RT solar activity

### promotion

- RT display devices
- increasing
- public relations
- upgrading

### prone position

- RT rest
- sitting position
- supine position

### Prony series

- GS analysis (mathematics)
- . calculus
- . . series (mathematics)
- . . . **Prony series**
- . real variables
- . . series (mathematics)
- . . . **Prony series**

### proofs

- USE **proving**

### ∞ propagation

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The spreading abroad or sending forward, as of radiant energy. Used for propagators.
- UF *propagators*
- RT acoustic propagation
- attenuation
- crack propagation
- diffraction propagation
- diffusion
- electromagnetic radiation
- flame propagation
- propagation (extension)
- self propagation
- stress propagation
- transequatorial propagation
- transmission
- wave propagation

### propagation (extension)

- GS **propagation (extension)**
- . crack propagation
- . flame propagation
- RT ∞ propagation

### propagation modes

- GS modes
- . **propagation modes**
- . . whispering gallery modes
- RT antipodes
- circular waveguides
- electromagnetic surface waves
- evanescent waves
- field mode theory
- mode transformers
- multimode resonators
- propagation velocity
- shock wave interaction
- wave interaction
- wave propagation

- waveguides

### propagation velocity

- GS rates (per time)
- . **propagation velocity**
- velocity
- . **propagation velocity**
- RT electromagnetic radiation
- group velocity
- phase velocity
- propagation modes
- wave propagation

### propagators

- USE **propagation**

### propane

- GS organic compounds
- . hydrocarbons
- . . aliphatic hydrocarbons
- . . . alkanes
- . . . . **propane**
- RT cyclopropane
- hydrocarbon fuels
- nitropropane

### propargyl groups

- DEF Crosslinking agents for certain aromatic polyamides used as matrix resins in fiber composites.
- GS organic compounds
- . **propargyl groups**
- RT ethers
- getters
- phenyls

### ∞ propellant actuated devices

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT ejection seats
- explosive devices
- propellant actuated instruments
- rocket engines

### propellant actuated instruments

- RT actuators
- controllers
- ∞ instruments
- measuring instruments
- ∞ propellant actuated devices

### propellant additives

- GS additives
- . **propellant additives**
- . . propellant binders
- . . . solid rocket binders
- RT antiicing additives
- antioxidants
- catalysts
- composite propellants
- corrosion prevention
- gelled propellants
- inhibitors
- plasticizers
- storable propellants

### propellant binders

- GS additives
- . propellant additives
- . . **propellant binders**
- . . . solid rocket binders
- binders (materials)
- . **propellant binders**
- . . solid rocket binders
- RT composite propellants
- glycidyl azide polymer
- rocket propellants
- solid propellants

### propellant casting

- GS castings
- . **propellant casting**
- forming techniques
- . casting
- . . **propellant casting**

### propellant chemistry

- RT ∞ chemistry
- solid propellant combustion

- thermochemistry
- propellant combustion**
  - GS combustion
    - . **propellant combustion**
    - . . solid propellant combustion
    - . . . solid propellant ignition
  - RT axial modes
    - combustion efficiency
    - combustion stability
    - erosive burning
    - fuel combustion
    - hydrocarbon combustion
    - ignition
    - metal combustion
    - reacting flow
    - turbulent combustion
    - velocity coupling
- propellant consumption**
  - (added June 1995)
  - GS consumption
    - . **propellant consumption**
  - RT burning rate
    - combustion efficiency
    - fuel consumption
    - propellant tanks
    - rocket propellants
    - solid propellant combustion
- propellant decomposition**
  - GS decomposition
    - . **propellant decomposition**
  - RT endothermic fuels
    - fuel corrosion
    - inhibitors
    - monopropellants
    - storable propellants
- propellant evaporation**
  - GS phase transformations
    - . vaporizing
    - . . evaporation
    - . . . **propellant evaporation**
  - RT evaporative cooling
    - storable propellants
- propellant explosions**
  - DEF Detonations of propellants as a result of motor malfunction.
  - GS explosions
    - . chemical explosions
    - . . **propellant explosions**
  - RT detonation
    - implosions
    - rocket engines
- propellant grains**
  - RT burning rate
  - ∞ grains
    - solid propellants
    - solid rocket propellants
- propellant mass ratio**
  - GS ratios
    - . mass ratios
    - . . **propellant mass ratio**
  - RT payload mass ratio
    - pressure ratio
    - propulsion system performance
    - propulsive efficiency
    - specific impulse
    - stage separation
- propellant oxidizers*
  - USE **rocket oxidizers**
- propellant properties**
  - GS **propellant properties**
    - . propellant sensitivity
    - . propellant storability
  - RT chemical properties
    - elastic properties
    - mechanical properties
  - ∞ physical properties
  - ∞ properties
    - thermodynamic properties
- propellant sensitivity**
  - GS propellant properties
- . **propellant sensitivity**
- sensitivity
- RT ignition temperature
  - impact resistance
  - shock resistance
  - spontaneous combustion
  - storable propellants
- propellant sprays**
  - RT fuel injection
    - fuel sprays
    - liquid injection
    - liquid rocket propellants
    - sprayers
- propellant storability**
  - GS propellant properties
    - . **propellant storability**
  - RT fuel corrosion
    - inhibitors
    - storable propellants
- propellant storage**
  - RT consumables (spacecraft)
    - expulsion bladders
    - fuel tank pressurization
    - fuel tanks
    - ground support equipment
    - handling equipment
    - missile storage
    - rocket propellants
    - space storage
    - storable propellants
  - ∞ storage
    - underground storage
- propellant tanks**
  - UF *rocket propellant tanks*
    - Shuttle Superlightweight Tank*
    - SLWT (propellant tank)*
  - GS tanks (containers)
    - . **propellant tanks**
  - RT cylindrical tanks
    - expulsion bladders
    - external tanks
    - fluid filled shells
    - fuel tank pressurization
    - fuel tanks
    - liquid filled shells
    - liquid propellant rocket engines
    - liquid sloshing
    - pressure vessels
    - propellant consumption
    - spherical tanks
    - storage tanks
    - tank geometry
    - ullage
- propellant tests**
  - RT chemical compatibility
    - cold flow tests
    - corrosion tests
    - engine tests
    - fuel tests
    - interior ballistics
  - ∞ materials tests
    - missile tests
    - propulsive efficiency
    - stability tests
  - ∞ tests
- propellant transfer**
  - GS fluid flow
    - . fuel flow
    - . . **propellant transfer**
    - materials handling
    - . **propellant transfer**
  - RT fuel control
    - fuel systems
    - liquid sloshing
    - refueling
- propellants**
  - DEF Any agents used for consumption or combustion in rockets and from which the rockets derive their thrust, such as fuels, oxidizers, additives, catalysts, or any compounds or mixture of these; specifically, fuels, oxidants, or a combination or mixture of fuels and oxidants
- used in propelling rockets. Propellants are commonly in either liquid or solid form.
- GS **propellants**
  - . colloidal propellants
  - . double base propellants
  - . . double base rocket propellants
  - . gelled propellants
  - . . gelled rocket propellants
  - . gun propellants
  - . high energy propellants
  - . . Domino propellants
  - . high temperature propellants
  - . hybrid propellants
  - . hydrazine nitroform
  - . hydrogen azides
  - . nitrasol explosives
  - . pentolite
  - . RDX
  - . rocket propellants
  - . . gaseous rocket propellants
  - . . liquid rocket propellants
  - . . . cryogenic rocket propellants
  - . . . gelled rocket propellants
  - . . . hypergolic rocket propellants
  - . . . monopropellants
  - . . . RP-1 rocket propellants
  - . . . slurry propellants
  - . . . slush hydrogen
  - . . . aerazine
  - . . nitramine propellants
  - . . solid rocket propellants
  - . . . double base rocket propellants
  - . . . HMX
  - . . . HTPB propellants
  - . . . metal propellants
  - . . TAGN
  - . . TATB
  - . solid propellants
  - . . case bonded propellants
  - . . composite propellants
  - . . nitramine propellants
  - . . plastic propellants
  - . . solid rocket propellants
  - . . . double base rocket propellants
  - . . . HMX
  - . . . HTPB propellants
  - . . . metal propellants
  - . . storable propellants
  - . tetryl
- RT ammunition
  - ascent propulsion systems
  - auxiliary propulsion
  - ballistics
  - burning rate
  - cartridges
  - chemical fuels
  - ∞ energy sources
  - explosives
  - fuel tanks
  - fuels
  - fulminates
  - guns (ordnance)
  - incendiary ammunition
  - oxetane polymers
  - ∞ power supplies
  - propulsion
  - spacecraft power supplies
  - spacecraft propulsion
  - specific impulse
  - torpedoes
- propeller blades**
  - GS airfoils
    - . **propeller blades**
  - RT blade tips
    - ∞ blades
      - fan blades
      - feathering
      - propellers
      - prop-fan technology
      - rotary wings
      - synchrophasing
- propeller drive**
  - GS mechanical drives
    - . **propeller drive**
    - . . helicopter propeller drive
  - RT contrarotating propellers
    - marine propulsion

## propeller efficiency

propellers  
underwater propulsion

### propeller efficiency

GS efficiency  
. propulsive efficiency  
. . . **propeller efficiency**  
RT contrarotating propellers  
power efficiency  
propellers  
prop-fan technology

### propeller fans

GS propellers  
. **propeller fans**  
RT ducted fans  
 $\infty$  fans  
lift fans  
prop-fan technology

### propeller noise

(added July 1989)  
GS elastic waves  
. sound waves  
. . . noise (sound)  
. . . . aircraft noise  
. . . . . **propeller noise**  
. . . . . flow noise  
. . . . . aerodynamic noise  
. . . . . **propeller noise**  
RT acoustic retrofitting  
aeroacoustics  
blade slap noise  
engine noise  
Flowcs Williams-Hawkings equation  
mufflers  
noise intensity  
noise measurement  
noise prediction (aircraft)  
noise reduction  
sound fields  
sound transmission

### propeller slipstreams

GS wakes  
. aircraft wakes  
. . . slipstreams  
. . . . **propeller slipstreams**  
. . . . . turbulent wakes  
. . . . . slipstreams  
. . . . . **propeller slipstreams**  
RT interference drag

### propellers

GS **propellers**  
. contrarotating propellers  
. propeller fans  
. shrouded propellers  
. tilted propellers  
. variable pitch propellers  
RT actuator disks  
feathering  
propeller blades  
propeller drive  
propeller efficiency  
ships

### proper motion

(added July 2005)  
DEF The motion of a celestial object perceived with respect to the celestial sphere.  
GS motion  
. **proper motion**  
RT angular velocity  
astrometry  
astronomical coordinates  
celestial reference systems  
celestial sphere  
stellar motions

### $\infty$ properties

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *attributes*  
RT acoustic properties  
biodegradability  
chemical properties  
creep properties  
dielectric properties  
dynamic characteristics

elastic properties  
electrical properties  
electromagnetic properties  
hydrophobicity  
hygral properties  
macroscopic equations  
magnetic properties  
 $\infty$  materials science  
mechanical properties  
optical properties  
 $\infty$  physical properties  
plastic properties  
porosity  
prejudices  
progress  
propellant properties  
proximity  
recoverability  
regularity  
shear properties  
structural properties (geology)  
surface properties  
tensile properties  
thermochemical properties  
thermodynamic properties  
thermophysical properties  
transport properties  
turbidity  
virtual properties

### *propfan technology*

USE **prop-fan technology**

### prop-fan technology

DEF Technology of a small diameter, highly loaded, many-bladed variable pitch advanced turboprop.  
UF *propfan technology*  
RT propeller blades  
propeller efficiency  
propeller fans  
turboprop engines

### prophylaxis

RT diseases  
immunology

### propionic acid

GS acids  
. carboxylic acids  
. . . fatty acids  
. . . . **propionic acid**  
organic compounds  
. carboxylic acids  
. . . fatty acids  
. . . . **propionic acid**

### proportion

RT distributing ratios

### proportional control

DEF Control of an aircraft, rocket or spacecraft in which the control surface deflection is proportional to the movement of the remote controls.  
GS automatic control  
. **proportional control**  
RT  $\infty$  control  
control equipment  
feedback control  
off-on control  
proportional navigation  
servocontrol

### proportional counters

GS ionization chambers  
. **proportional counters**  
measuring instruments  
. counters  
. . . radiation counters  
. . . . **proportional counters**  
. . . . . radiation measuring instruments  
. . . . . radiation counters  
. . . . . **proportional counters**  
RT anticoincidence detectors  
dosimeters  
Geiger counters

neutron counters

### proportional limit

UF *elastic strength*  
GS mechanical properties  
. elastic properties  
. . . **proportional limit**  
range (extremes)  
. **proportional limit**  
RT critical loading  
modulus of elasticity  
stress-strain diagrams

### proportional navigation

(added July 1998)  
GS navigation  
. **proportional navigation**  
RT homing  
interception  
line of sight  
missile control  
proportional control  
rendezvous guidance  
terminal guidance

### proposals

(added February 1992)  
GS documents  
. **proposals**  
RT contracts  
cost analysis  
reports  
research and development

### proprioception

UF *kinesthesia*  
GS perception  
. sensory perception  
. . . **proprioception**  
. . . . autokinesis  
RT gravity perception  
kinesthesia

### proprioceptors

GS anatomy  
. sense organs  
. . . **proprioceptors**  
receptors (physiology)  
. **proprioceptors**  
RT baroreceptors  
nervous system  
sensitometry

### propulsion

GS **propulsion**  
. ascent propulsion systems  
. auxiliary propulsion  
. chemical propulsion  
. . . hybrid propulsion  
. . . . descent propulsion systems  
. . . . . electric propulsion  
. . . . . electromagnetic propulsion  
. . . . . magnetic sails  
. . . . . electrostatic propulsion  
. . . . . ion propulsion  
. . . . . laser propulsion  
. . . . . plasma propulsion  
. . . . . solar electric propulsion  
. . . . . jet propulsion  
. . . . . low thrust propulsion  
. . . . . electromagnetic propulsion  
. . . . . magnetic sails  
. . . . . electrostatic propulsion  
. . . . . ion propulsion  
. . . . . man operated propulsion systems  
. . . . . photonic propulsion  
. . . . . laser propulsion  
. . . . . plasma propulsion  
. . . . . solar propulsion  
. . . . . solar electric propulsion  
. . . . . solar thermal propulsion  
. . . . . marine propulsion  
. . . . . underwater propulsion  
. . . . . submarine propulsion  
. . . . . nuclear propulsion  
. . . . . fusion propulsion  
. . . . . nuclear electric propulsion  
. . . . . space station propulsion  
. . . . . spacecraft propulsion  
. . . . . electromagnetic propulsion

- . . . magnetic sails
- . . . electrostatic propulsion
- . . . ion propulsion
- . . . matter-antimatter propulsion
- . . . negative matter propulsion
- . . . photonic propulsion
- . . . laser propulsion
- . . . plasma propulsion
- . . . solar propulsion
- . . . solar electric propulsion
- . . . solar thermal propulsion
- RT aeronautical engineering
  - ∞ aircraft
  - ∞ astronautics
  - ∞ drives
  - engines
  - exhaust gases
  - fuel tank pressurization
  - fuel tanks
  - high impulse
  - locomotion
  - mass drivers
  - missiles
  - post boost propulsion system
  - propellants
  - propulsive efficiency
  - pulling
  - pushing
  - rocket propellants
  - solar sails
  - space flight
  - Space Shuttle Main Engine
  - space tugs
  - thrust
- propulsion system configurations**
  - GS **propulsion system configurations**
    - . ascent propulsion systems
    - . descent propulsion systems
  - RT aerodynamic configurations
    - aerospike engines
    - aircraft configurations
    - auxiliary propulsion
  - ∞ configurations
    - convertible fan-shaft engines
    - laser propulsion
    - launch vehicle configurations
    - missile configurations
    - post boost propulsion system
    - space station propulsion
    - spacecraft configurations
  - ∞ systems
    - topping cycle engines
- propulsion system performance**
  - RT cold flow tests
  - combustion efficiency
  - ∞ performance
    - power efficiency
    - propellant mass ratio
    - propulsive efficiency
    - rocket thrust
    - solar thermal propulsion
    - specific impulse
  - ∞ systems
    - systems health monitoring
    - thermodynamic efficiency
    - total impulse
- propulsive efficiency**
  - DEF The efficiency with which energy available for propulsion is converted into thrust by a rocket engine.
  - GS efficiency
    - . **propulsive efficiency**
    - . . propeller efficiency
  - RT combustion efficiency
    - engine tests
    - laser propulsion
    - multistage rocket vehicles
    - nozzle efficiency
    - power efficiency
    - propellant mass ratio
    - propellant tests
    - propulsion
    - propulsion system performance
    - specific impulse
    - thermodynamic efficiency
    - thrust programming

- total impulse
- propyl compounds**
  - RT ∞ chemical compounds
- propyl nitrate**
  - GS alkyl compounds
    - . **propyl nitrate**
    - . esters
      - . nitrate esters
    - . **propyl nitrate**
    - . nitrogen compounds
      - . nitrate esters
    - . . **propyl nitrate**
- propylene**
  - GS organic compounds
    - . hydrocarbons
      - . . aliphatic hydrocarbons
      - . . . alkenes
    - . . . **propylene**
- propylene oxide**
  - GS epoxy compounds
    - . **propylene oxide**
- prospecting*
  - USE **exploration**
- prostaglandins**
  - GS organic compounds
    - . lipids
      - . . steroids
      - . . . **prostaglandins**
    - . secretions
      - . endocrine secretions
      - . . hormones
      - . . . **prostaglandins**
  - RT biosynthesis
    - prostate gland
- prostate gland**
  - GS anatomy
    - . genitourinary system
    - . . reproductive systems
      - . . . sex glands
      - . . . . **prostate gland**
    - . . glands (anatomy)
      - . . sex glands
      - . . . **prostate gland**
  - RT bladder
    - prostaglandins
- prosthetic devices**
  - GS medical equipment
    - . **prosthetic devices**
    - . . artificial ears
  - RT walking machines
- protactinium**
  - GS chemical elements
    - . **protactinium**
    - . . protactinium isotopes
    - . metals
      - . **protactinium**
      - . . protactinium isotopes
- protactinium 234*
  - USE **protactinium isotopes**
- protactinium compounds**
  - GS **protactinium compounds**
    - . protactinium fluorides
  - RT ∞ chemical compounds
    - ∞ metal compounds
- protactinium fluorides**
  - GS halogen compounds
    - . fluorine compounds
      - . . fluorides
        - . . . metal fluorides
        - . . . . **protactinium fluorides**
      - . . halides
        - . . fluorides
          - . . . metal fluorides
          - . . . . **protactinium fluorides**
        - . . metal halides
          - . . . metal fluorides
          - . . . . **protactinium fluorides**
      - . . . **protactinium fluorides**
      - . . protactinium compounds

- . **protactinium fluorides**
- protactinium isotopes**
  - UF *protactinium 234*
  - GS chemical elements
    - . nuclides
      - . . isotopes
      - . . . **protactinium isotopes**
    - . protactinium
      - . . **protactinium isotopes**
    - . metals
      - . protactinium
        - . . **protactinium isotopes**
- protease**
  - GS biopolymers
    - . proteins
      - . . enzymes
      - . . . **protease**
    - . organic compounds
      - . proteins
        - . . enzymes
        - . . . **protease**
- protection**
  - GS **protection**
    - . acceleration protection
    - . circuit protection
    - . corrosion prevention
    - . environment protection
    - . eye protection
    - . meteoroid protection
    - . radiation protection
    - . . radiation shielding
      - . . . solar radiation shielding
    - . planetary protection
    - . thermal protection
    - . . planetary quarantine
  - RT accident prevention
    - airport security
    - civil defense
    - coatings
    - countermeasures
    - flying ejection seats
    - hazards
    - housings
    - insulation
    - prevention
    - protectors
    - ∞ resistance
    - safety
      - safety devices
      - shielding
      - warning
      - warning systems
- protective clothing**
  - GS clothing
    - . **protective clothing**
    - . . helmets
    - . . pressure suits
      - . . . space suits
      - . . . . extravehicular mobility units
    - . . vapor barrier clothing
  - RT armor
    - chemical defense
    - coveralls
    - emergency life sustaining systems
    - flight clothing
    - gloves
    - goggles
    - masks
    - safety devices
    - shoes
- protective coatings**
  - UF *ceramal protective coatings*
  - sprayed protective coatings*
  - GS coatings
    - . **protective coatings**
    - . . anodic coatings
    - . . ceramic coatings
    - . . primers (coatings)
    - . . refractory coatings
  - RT alkyd resins
    - aluminides
    - anodizing
    - carbon nitrides
    - cladding
    - ∞ construction materials

## protectors

- corrosion
- desensitizing
- electroplating
- encapsulating
- finishes
- glass coatings
- glazes
- gold coatings
- HVOF thermal spraying
- inorganic coatings
- lacquers
- metal coatings
- nickel coatings
- optical coatings
- paints
- plastic coatings
- plating
- rubber coatings
- sprayed coatings
- surface finishing
- transgranular corrosion
- varnishes
- waterproofing
- zinc coatings

### protectors

- GS **protectors**
  - . ear protectors
- RT bumpers
- ∞ containers
- enclosures
- fairings
- housings
- protection
- safety devices
- ∞ screens
- sheaths
- shielding

### protein crystal growth

(added March 1989)

- GS growth
  - . crystal growth
  - . . **protein crystal growth**
- RT protein synthesis
- proteins
- space processing

### protein denaturation

USE **biopolymer denaturation**

### protein metabolism

- GS metabolism
  - . **protein metabolism**
  - . . lipid metabolism
- RT glucocorticoids
- protein synthesis
- synthetic food

### protein synthesis

DEF Process by which protein molecules are formed.

- RT biological evolution
- chemical evolution
- protein crystal growth
- protein metabolism

### proteinoids

- GS biopolymers
  - . proteins
  - . . **proteinoids**
- organic compounds
- . proteins
- . . **proteinoids**

### proteins

- GS biopolymers
  - . **proteins**
  - . . albumins
  - . . aspartates
  - . . calmodulin
  - . . elastin
  - . . enzymes
  - . . . aldolase
  - . . . amidase
  - . . . carbonic anhydrase
  - . . . catalase
  - . . . cholinesterase
  - . . . cytochromes
  - . . . dehydrogenases

- . . . hexokinase
- . . . lysozyme
- . . . nuclease
- . . . oxidase
- . . . papain
- . . . pepsin
- . . . phosphatases
- . . . protease
- . . . renin
- . . . thrombin
- . . . trypsin
- . . fibrin
- . . globulins
- . . . fibrinogen
- . . . gamma globulin
- . . hemoglobin
- . . . carboxyhemoglobin
- . . . oxyhemoglobin
- . . keratins
- . . lipoproteins
- . . luminescent proteins
- . . melanin
- . . myoglobin
- . . myosins
- . . osteocalcin
- . . phytochrome
- . . proteinoids
- . . prothrombin
- . . protoproteins
- . . tumor suppressor proteins
- organic compounds

- . **proteins**
- . . albumins
- . . aspartates
- . . calmodulin
- . . elastin
- . . enzymes
- . . . aldolase
- . . . amidase
- . . . carbonic anhydrase
- . . . catalase
- . . . cholinesterase
- . . . cytochromes
- . . . dehydrogenases
- . . . hexokinase
- . . . lysozyme
- . . . nuclease
- . . . oxidase
- . . . papain
- . . . pepsin
- . . . phosphatases
- . . . protease
- . . . renin
- . . . thrombin
- . . . trypsin
- . . fibrin
- . . globulins
- . . . fibrinogen
- . . . gamma globulin
- . . hemoglobin
- . . . carboxyhemoglobin
- . . . oxyhemoglobin
- . . keratins
- . . lipoproteins
- . . luminescent proteins
- . . melanin
- . . myoglobin
- . . myosins
- . . osteocalcin
- . . phytochrome
- . . proteinoids
- . . prothrombin
- . . protoproteins
- . . tumor suppressor proteins

- RT adrenocorticotropin (ACTH)
- alanine
- biopolymer denaturation
- collagens
- cysteamine
- cysteine
- ∞ food
- macromolecules
- nucleic acids
- nucleotides
- ∞ nutrients
- peptides
- polynucleotides
- polypeptides
- protein crystal growth

- proteome
- protoplasm
- serums
- synthetic food

### proteome

(added September 2001)

DEF An organism's protein complement as coded for by its genome.

- RT genome
- molecular biology
- proteins

### Proteus

(added July 1995)

DEF A natural satellite of Neptune, orbiting at a mean distance of 117,600 kilometers.

- GS celestial bodies
  - . natural satellites
  - . . Neptune satellites
  - . . . **Proteus**
- RT Neptune (planet)

### prothrombin

- GS biopolymers
  - . proteins
  - . . **prothrombin**
- organic compounds
- . proteins
- . . **prothrombin**
- RT thrombin

### protium

USE **light water**

### protobiology

- RT abiogenesis
- biological diversity
- biological evolution
- ∞ biology
- chemical evolution
- paleontology
- viruses

### protocol (computers)

- GS **protocol (computers)**
  - . carrier sense multiple access
  - . Ethernet
- RT channels (data transmission)
- communication networks
- computer networks
- computer security
- data links
- data processing
- data transmission
- interoperability
- local area networks
- networks
- packet switching
- World Wide Web

### protogalaxies

(added May 2002)

DEF Clouds of hydrogen gas and dark matter hypothesized to give rise to galaxies.

- UF *primordial galaxies*
- GS celestial bodies
  - . galaxies
  - . . **protogalaxies**
- RT galactic clusters
- galactic evolution
- gravitational collapse
- star formation

### Proton 1 satellite

- GS artificial satellites
  - . Soviet satellites
  - . . Proton satellites
  - . . . **Proton 1 satellite**

### Proton 2 satellite

- GS artificial satellites
  - . Soviet satellites
  - . . Proton satellites
  - . . . **Proton 2 satellite**

### Proton 3 satellite

- GS artificial satellites
  - . Soviet satellites
  - . . Proton satellites

- ... **Proton 3 satellite**
- space commercialization
- thermonuclear reactions
- Proton 4 satellite**
  - GS artificial satellites
    - . Soviet satellites
    - . . . Proton satellites
    - . . . **Proton 4 satellite**
- proton beams**
  - GS beams (radiation)
    - . particle beams
    - . . **proton beams**
  - RT neutron beams
- proton belts**
  - GS particles
    - . charged particles
    - . . magnetically trapped particles
    - . . . radiation belts
    - . . . . **proton belts**
    - . . . . corpuscular radiation
    - . . . . radiation belts
    - . . . . **proton belts**
    - . . . . trapped particles
    - . . . . magnetically trapped particles
    - . . . . radiation belts
    - . . . . **proton belts**
  - RT ∞ belts
    - inner radiation belt
    - outer radiation belt
- proton damage**
  - GS damage
    - . **proton damage**
- proton density (concentration)**
  - GS density (number/volume)
    - . particle density (concentration)
    - . . ion density (concentration)
    - . . . **proton density (concentration)**
    - . . . . magnetospheric proton density
  - RT atmospheric density
    - atom concentration
    - plasma density
    - space density
- proton energy**
  - GS particle energy
    - . **proton energy**
  - RT activation energy
    - electron energy
  - ∞ energy
    - kinetic energy
    - surface energy
- proton flux density**
  - SN (LIMITED TO PROTON EMISSION OR DETECTION RATE PER UNIT AREA)
  - GS rates (per time)
    - . flux density
    - . . radiant flux density
    - . . . particle flux density
    - . . . . **proton flux density**
  - RT irradiance
    - radiancy
    - radiation counters
    - solar flux density
- proton impact**
  - GS impact
    - . **proton impact**
  - RT electron impact
    - point impact
- proton irradiation**
  - GS irradiation
    - . ion irradiation
    - . . **proton irradiation**
  - RT deuteron irradiation
    - electron radiation
- Proton launch vehicle**
  - (added April 1995)
  - GS launch vehicles
    - . heavy lift launch vehicles
    - . . **Proton launch vehicle**
  - RT international cooperation
    - Russian Space Program
- proton magnetic resonance**
  - GS resonance
    - . magnetic resonance
    - . . nuclear magnetic resonance
    - . . . **proton magnetic resonance**
- proton masers**
  - GS stimulated emission devices
    - . masers
    - . . **proton masers**
  - RT magnetometers
- proton precession**
  - GS gyration
    - . precession
    - . . **proton precession**
  - RT free vibration
- proton precipitation**
  - GS particle precipitation
    - . **proton precipitation**
  - RT auroras
    - electron precipitation
    - particles
  - ∞ precipitation
    - radiation belts
    - trapped particles
    - upper atmosphere
- proton protuberances**
  - GS protuberances
    - . **proton protuberances**
- proton resonance**
  - GS resonance
    - . magnetic resonance
    - . . nuclear magnetic resonance
    - . . . **proton resonance**
  - RT nuclear particles
- Proton satellites**
  - GS artificial satellites
    - . Soviet satellites
    - . . **Proton satellites**
    - . . . Proton 1 satellite
    - . . . Proton 2 satellite
    - . . . Proton 3 satellite
    - . . . Proton 4 satellite
  - RT U.S.S.R. space program
- proton scattering**
  - GS nuclear reactions
    - . **proton scattering**
    - scattering
    - . **proton scattering**
  - RT ion scattering
- proton telescopes*
  - USE **particle telescopes**
- proton-antiproton interactions**
  - (added June 1999)
  - GS particle interactions
    - . elementary particle interactions
    - . . **proton-antiproton interactions**
  - RT annihilation reactions
    - antiprotons
    - high energy interactions
    - matter-antimatter propulsion
- proton-proton reactions**
  - DEF Thermonuclear reactions in which two protons collide at very high velocities and combine to form deuterons. The resultant deuterons may capture other protons to form tritium and the latter may undergo proton capture to form helium. The proton-proton reactions are now believed to be the principal sources of energy within the sun and other stars of its class. A temperature of 5 million degrees Kelvin and high hydrogen (proton) concentrations are required for these reactions to proceed at rates compatible with energy emission by such stars.
  - GS nuclear reactions
    - . **proton-proton reactions**
  - RT annihilation reactions
    - ∞ interactions
    - pomerons
- protons**
  - DEF Positively charged subatomic particles having a mass of 1.67252 times 10 to the minus 24 gram, slightly less than that of an electron.
  - GS particles
    - . charged particles
    - . . **protons**
    - . . . recoil protons
    - . . . solar protons
    - . . . elementary particles
    - . . . fermions
    - . . . **protons**
    - . . . . recoil protons
    - . . . . solar protons
  - RT alpha particles
    - antiprotons
    - baryons
    - cosmic rays
    - deuterons
    - flux density
    - hydrogen ions
    - ions
    - nuclear particles
    - nuclei (nuclear physics)
    - nucleon potential
    - nucleons
    - positive ions
    - radiation belts
    - radiation shielding
    - tritons
- protoplanetary disks**
  - (added March 2001)
  - DEF Circumstellar disks from which planetary systems are created during star formation.
  - RT accretion disks
    - planetary evolution
    - planets
    - protoplanets
    - solar system evolution
    - stellar envelopes
    - stellar evolution
- protoplanets**
  - DEF Transition objects formed during primordial cloud condensation into stellar systems (stars, planets, etc.) which form the nucleus of planetary accretion. Used for planetesimals.
  - UF *planetesimals*
  - GS celestial bodies
    - . **protoplanets**
  - RT cosmology
    - planetary environments
    - planetary evolution
    - planetary mass
    - planets
    - protoplanetary disks
    - solar nebula
    - solar orbits
    - solar system
    - stellar evolution
- protoplasm**
  - RT proteins
- protoplasts**
  - GS cells (biology)
    - . **protoplasts**
- protoproteins**
  - GS biopolymers
    - . proteins
    - . . **protoproteins**
    - organic compounds
    - . proteins
    - . . **protoproteins**
  - RT amino acids
- protosolar nebula*
  - (added June 2001)
  - USE **solar nebula**
- protostars**
  - GS celestial bodies
    - . stars
    - . . **protostars**
    - . . . pre-main sequence stars
    - . . . . T Tauri stars

## prototypes

RT brown dwarf stars  
solar nebula  
star formation  
stellar evolution  
stellar mass accretion

### prototypes

DEF Preliminary type, form, or instance of systems that serve as models for later stages or for the final, completed version of the systems.

RT breadboard models  
∞ patterns  
pilot plants  
rapid prototyping

### protozoa

GS animals  
. **protozoa**  
. . . amoeba  
. . . pelomyxa  
. . . Flagellata  
. . . Euglena  
. . . trypanosome  
. . . paramecia  
microorganisms  
. **protozoa**  
. . . amoeba  
. . . pelomyxa  
. . . Flagellata  
. . . Euglena  
. . . trypanosome  
. . . paramecia  
RT microspores  
spores

### protractors

GS measuring instruments  
. **protractors**  
RT angles (geometry)

### protuberances

SN (COMPONENTS MOUNTED EXTERNAL TO THE STRUCTURE)  
GS **protuberances**  
. proton protuberances  
RT aerodynamic configurations  
aerodynamic interference  
aircraft antennas  
aircraft parts  
airframes  
∞ blisters  
cowlings  
domes (structural forms)  
external store separation  
external stores  
fairings  
fuel tanks  
housings  
nacelles  
papillae  
pitot tubes  
radomes  
∞ ridges  
shells (structural forms)  
vortex alleviation  
wing-fuselage stores  
winglets

### proustite

GS arsenic compounds  
. arsenides  
. . . **proustite**  
minerals  
. **proustite**

*Provider aircraft*

USE **C-123 aircraft**

### proving

UF *confirmation*  
*demonstration*  
*proofs*  
*validation*  
*verification (proving)*  
GS **proving**  
. theorem proving  
RT acceptability  
error detection codes  
evaluation  
examination

mathematical logic  
∞ measurement  
program verification (computers)  
∞ tests

### provisioning

RT consumables (spacecrew supplies)  
∞ food  
life support systems  
space rations  
stowage (onboard equipment)

### proximity

RT distance  
∞ properties  
tightness

### proximity effect (electricity)

DEF Redistribution of current in a conductor caused by the presence of another conductor.

GS electrical properties  
. inductance  
. . **proximity effect (electricity)**  
electromagnetic properties  
. inductance  
. . **proximity effect (electricity)**  
RT ∞ effects  
electricity  
superconductors (materials)  
volt-ampere characteristics

*PRTR (reactor)*

USE **plutonium recycle test reactor**

*prussic acid*

USE **hydrocyanic acid**

### pseudomonas

GS microorganisms  
. bacteria  
. . **pseudomonas**

### pseudonoise

RT random noise

### pseudopotentials

DEF Factors in an approximate method for calculation of energy bands in solids by the use of approximation which includes the many body effect.

RT impurities  
melting  
semiconductors (materials)

### pseudorandom sequences

RT random numbers  
∞ signals

*PSP (paints)*

*(added March 2001)*

USE **pressure sensitive paints**

### psychiatry

GS medical science  
. **psychiatry**  
. . neuropsychiatry  
. . social psychiatry  
RT brain  
military psychology  
psychology  
psychotherapy

### psychoacoustics

GS acoustics  
. **psychoacoustics**  
psychology  
. psychophysics  
. . **psychoacoustics**  
RT auditory perception  
auditory signals  
bells  
bioacoustics  
noise intensity  
psychological effects  
psychological factors

### psycholinguistics

DEF Study of linguistic behavior such as conditioning by psychological factors including the speaker's and listener's culturally deter-

mined categories of expression and comprehension.

GS linguistics  
. **psycholinguistics**

RT intelligibility  
phonemes  
phonemics  
robots  
semantics  
syllables  
syntax

### psychological effects

GS **psychological effects**  
. desynchronization (biology)  
. illusions  
. . hallucinations  
. . moon illusion  
. . oculogravic illusions  
. . optical illusion  
. . . elevator illusion  
. . jet lag  
RT afterimages  
aviation psychology  
biological effects  
boredom  
comfort  
confidence  
disorientation  
∞ effects  
emotions  
environmental engineering  
environments  
frustration  
human factors engineering  
human reactions  
humidity  
military psychology  
moods  
psychoacoustics  
reaction time  
space adaptation syndrome  
space psychology  
stress (biology)  
stress (psychology)  
Taylor manifest anxiety scale

### psychological factors

RT astronaut performance  
aviation psychology  
emotional factors  
flight stress (biology)  
habits  
moods  
permissivity  
psychoacoustics  
psychosomatics  
reward (psychology)  
sex factor  
space psychology  
∞ stimuli  
stress (psychology)

*psychological indexes*

USE **psychological tests**

### psychological sets

GS psychology  
. **psychological sets**

### psychological tests

UF *psychological indexes*  
GS **psychological tests**  
. Rorschach tests  
RT certification  
environmental tests  
intelligence tests  
limen  
military psychology  
personality tests  
pilot selection  
psychometrics  
ratios  
Skinner boxes  
Taylor manifest anxiety scale  
∞ tests

### psychology

DEF The science which studies the functions of the mind, such as sensation, perception,

memory, thought, and, more broadly the behavior of an organism in relation to its environment.

- GS **psychology**
  - . aviation psychology
  - . cognitive psychology
  - . military psychology
  - . psychological sets
  - . psychophysics
  - . . psychoacoustics
  - . space psychology
- RT biofeedback
- boredom
- brain
- cybernetics
- detachment
- diagnosis
- disorders
- disorientation
- emotional factors
- emotions
- extroversion
- frustration
- inspiration
- intellect
- introversion
- morale
- prejudices
- psychiatry
- psychometrics
- psychotherapy
- Rorschach tests
- stress (psychology)
- subliminal stimuli

**psychometrics**

- RT diagnosis
- education
- military psychology
- norms
- personality tests
- psychological tests
- psychology
- psychomotor performance
- psychophysics
- psychosomatics
- Skinner boxes

**psychomotor performance**

DEF Of or pertaining to muscular action ensuing directly from a mental process, as in the coordinated manipulation of aircraft or spacecraft controls.

- GS sensorimotor performance
  - . **psychomotor performance**
  - . . psychosomatics
- RT abilities
- biocontrol systems
- human performance
- human reactions
- mental performance
- operator performance
- physiological tests
- pilot performance
- psychometrics
- reaction time
- workloads (psychophysiology)

**psychopharmacology**

DEF The science that deals with the action of drugs on mental function.

- GS medical science
  - . pharmacology
  - . . **psychopharmacology**
- RT central nervous system
- central nervous system depressants
- central nervous system stimulants
- drugs
- life sciences
- medical science
- ∞ medicine
- nervous system
- psychotropic drugs

**psychophysics**

- GS psychology
  - . **psychophysics**
  - . . psychoacoustics
- RT ∞ physics
- psychometrics

∞ science

**psychophysiology**

- GS physiology
  - . **psychophysiology**
- RT evoked response (psychophysiology)
- information processing (biology)
- ∞ science
- workloads (psychophysiology)

**psychoses**

- GS **psychoses**
  - . psychotic depression
  - . schizophrenia
- RT detachment
- disorders
- fear
- irrationality
- neuroses

**psychosomatics**

- GS sensorimotor performance
  - . psychomotor performance
  - . . **psychosomatics**
- RT psychological factors
- psychometrics

**psychotherapy**

- GS therapy
  - . **psychotherapy**
- RT convulsions
- Gestalt theory
- health
- mental health
- neuropsychiatry
- psychiatry
- psychology
- psychotropic drugs

**psychotic depression**

- GS psychoses
  - . **psychotic depression**
- RT ∞ depression
- neurotic depression

**psychotropic drugs**

- GS drugs
  - . **psychotropic drugs**
  - . . marijuana
- RT central nervous system
- narcotics
- neurophysiology
- physiochemistry
- psychopharmacology
- psychotherapy
- sedatives

**psychrometers**

DEF Instruments for measuring humidity through the use of wet and dry bulb thermometers.

- GS measuring instruments
  - . moisture meters
  - . . hygrometers
  - . . . **psychrometers**
- RT atmospheric moisture
- chemical analysis
- humidity
- humidity measurement
- meteorological instruments

**psychrophiles**

- RT mesophiles
- microorganisms
- thermophiles

*PTM (modulation)*

USE **pulse modulation**

**Ptolemaeus Crater**

- GS craters
  - . lunar craters
  - . . **Ptolemaeus Crater**
- RT meteorite craters

**p-type semiconductors**

- GS semiconductors (materials)
  - . **p-type semiconductors**
- RT holes (electron deficiencies)
- indium aluminum arsenides

semiconductor junctions

**public address systems**

- RT ∞ systems
- warning systems

**public health**

- GS biophysics
  - . health physics
  - . . **public health**
- health
  - . health physics
  - . . **public health**
- RT hazardous material disposal (in space)
- hygiene
- medical services
- nonpoint sources
- occupational diseases
- oral hygiene
- pollution
- sanitation
- urban planning

**public law**

- GS law (jurisprudence)
  - . **public law**
  - . . liabilities
  - . . . legal liability
  - . . penalties
- RT air law
- insurance (contracts)

**public relations**

- RT ∞ cooperation
- improvement
- promotion
- upgrading

**public speaking**

- UF *oratory*
- RT lectures
- speech

*publications*

USE **documents**

**Puck**

(*added July 1995*)  
 DEF A natural satellite of Uranus, orbiting at a mean distance of 86,010 kilometers.

- GS celestial bodies
  - . natural satellites
  - . . Uranus satellites
  - . . . **Puck**
- RT Uranus (planet)

**Puerto Rico**

- GS landforms
  - . islands
  - . . West Indies
  - . . . **Puerto Rico**
- nations
- . United States
- . . **Puerto Rico**

**pulleys**

- RT ∞ belts
- blocks
- idlers
- rollers
- wheels
- winches

**pulling**

- RT ∞ drawing
- ∞ force
- propulsion
- traction

*pulling (frequency stability)*

USE **frequency pulling**

**pulmonary circulation**

- GS circulation
  - . blood circulation
  - . . **pulmonary circulation**
- RT alveoli
- artificial cardiac pacemaker
- blood pumps
- heart implantation



## pulmonary functions

lungs  
respiratory system

### pulmonary functions

RT alveoli  
∞ functions  
lungs

### pulmonary lesions

GS diseases  
. **pulmonary lesions**  
injuries  
. lesions  
. . . **pulmonary lesions**  
RT lung morphology  
lungs  
occupational diseases  
respiratory diseases

### pulsar magnetospheres

(added July 1988)  
GS stellar magnetospheres  
. **pulsar magnetospheres**  
RT magnetic fields  
∞ magnetospheres  
pulsars  
stellar atmospheres  
stellar magnetic fields

### pulsars

GS celestial bodies  
. radio sources (astronomy)  
. . . radio stars  
. . . **pulsars**  
. stars  
. . . neutron stars  
. . . **pulsars**  
. . . radio stars  
. . . **pulsars**  
RT degenerate matter  
gamma ray sources (astronomy)  
magnetars  
pulsar magnetospheres  
quasars  
radiation sources  
radio astronomy  
radio bursts  
starquakes  
supernova remnants

### pulsating flow

USE **unsteady flow**

### pulse (cardiovascular)

USE **heart rate**

### pulse amplitude

DEF A general term indicating the magnitude of a pulse. Used for pulse height.  
UF *pulse height*  
GS amplitudes  
. **pulse amplitude**  
waveforms  
. **pulse amplitude**  
RT amplitude distribution analysis  
electric pulses  
photopeak  
pulsed radiation  
sawtooth waveforms  
square waves

### pulse amplitude modulation

UF *PAM (modulation)*  
GS coding  
. signal encoding  
. . . pulse modulation  
. . . **pulse amplitude modulation**  
modulation  
. pulse modulation  
. . **pulse amplitude modulation**  
RT modems  
P.A.C.M. telemetry

### pulse charging

DEF Rapid and efficient method for charging electric batteries.  
RT battery chargers  
electric batteries  
electric charge

storage batteries

### pulse code modulation

DEF Any modulation which involves a pulse code. Used for PCM (modulation).  
UF *PCM (modulation)*  
GS coding  
. signal encoding  
. . . pulse modulation  
. . . . **pulse code modulation**  
. . . . delta modulation  
. . . . differential pulse code modulation  
modulation  
. pulse modulation  
. . **pulse code modulation**  
. . . delta modulation  
. . . differential pulse code modulation  
RT biternary code  
decommutators  
P.A.C.M. telemetry  
PCM telemetry  
unified S band

### pulse communication

UF *digital communication*  
GS telecommunication  
. **pulse communication**  
. . digital spacecraft television  
RT bit error rate  
communication networks  
data transmission  
delta modulation  
differential pulse code modulation  
digital television  
electromagnetic missiles  
electromagnetic pulses  
frequency division multiplexing  
modems  
multiple access  
multiplexing  
orthogonal multiplexing theory  
radio communication  
radio transmission  
satellite transmission  
signal transmission  
space communication  
telegraph systems  
telemetry  
time division multiple access

### pulse compression

DEF The coding and processing of a signal pulse of long time duration to one of short time duration and high range resolution, while maintaining the benefits of high pulse energy.  
RT coding  
compressing  
radar

### pulse detonation engines

(added March 2001)  
DEF Rocket engines that operate by injecting fuel and oxidizer into long chambers and igniting the mixture with a spark plug or similar device. Quasi-steady thrust levels can be achieved by repeating this cycle at relatively high frequency and/or using more than one combustion chamber operating out of phase.  
UF *PDE (engines)*  
*PDRE (engines)*  
*PDWE (engines)*  
*pulse detonation wave engines*  
GS engines  
. rocket engines  
. . liquid propellant rocket engines  
. . . **pulse detonation engines**  
RT air breathing engines  
detonation

### pulse detonation wave engines

(added March 2001)  
USE **pulse detonation engines**

### pulse diffraction

GS diffraction  
. **pulse diffraction**  
RT holographic optical elements  
plasma jets  
pulsed radiation

wave propagation

### pulse Doppler radar

DEF A pulse radar system which utilizes the Doppler effect for obtaining information about the target (not including simple resolution from fixed targets).  
GS radar  
. Doppler radar  
. . **pulse Doppler radar**  
. . . monopulse radar  
. . . Shuttle Imaging Radar  
. pulse radar  
. . **pulse Doppler radar**  
. . . monopulse radar  
. . . Shuttle Imaging Radar  
RT cancellation circuits  
coherent radar

### pulse duration

DEF The time interval between the first and last instances at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude. Used for light duration and pulse width.  
UF *light duration*  
*pulse width*  
GS waveforms  
. **pulse duration**  
RT electric pulses  
laser outputs  
maser outputs  
pulse repetition rate  
pulsed radiation  
sawtooth waveforms  
square waves  
time signals  
ultrashort pulsed lasers

### pulse duration modulation

DEF A form of pulse time modulation in which the duration of a pulse is varied. Used for PDM (modulation), pulse width modulation, and PWM (modulation).  
UF *PDM (modulation)*  
*pulse width modulation*  
*PWM (modulation)*  
GS coding  
. signal encoding  
. . pulse modulation  
. . . pulse time modulation  
. . . . **pulse duration modulation**  
modulation  
. pulse modulation  
. . pulse time modulation  
. . . **pulse duration modulation**  
RT modems

### pulse frequency modulation

DEF A form of pulse time modulation in which the pulse repetition rate is the characteristic varied. Used for PFM (modulation).  
UF *PFM (modulation)*  
GS coding  
. signal encoding  
. . frequency modulation  
. . . **pulse frequency modulation**  
. . pulse modulation  
. . . **pulse frequency modulation**  
modulation  
. frequency modulation  
. . **pulse frequency modulation**  
. pulse modulation  
. . **pulse frequency modulation**  
RT communication equipment  
differential pulse code modulation  
modems

### pulse frequency modulation telemetry

GS telecommunication  
. radio communication  
. . radio telemetry  
. . . **pulse frequency modulation**  
telemetry  
. telemetry  
. . radio telemetry  
. . . **pulse frequency modulation**  
telemetry  
transmission  
. signal transmission

- . . . telemetry
- . . . . radio telemetry
- . . . . . **pulse frequency modulation telemetry**
- RT communication equipment
- frequency modulation
- modulation
- pulse modulation
- radio transmission
- signal encoding

**pulse generators**

- RT compulsators
- electric pulses
- function generators
- ∞ generators
- Hartmann-Sprenger tubes
- impulse generators
- laser cavities
- lasers
- plasma generators
- pulse repetition rate
- pulsed radiation
- shock wave generators

**pulse heating**

- GS hardening (materials)
- . **pulse heating**
- heat treatment
- . annealing
- . . **pulse heating**
- heating
- . transient heating
- . . **pulse heating**
- RT laser heating
- simulated annealing

*pulse height*

USE **pulse amplitude**

**pulse modulation**

DEF Modulation of a carrier by a pulse train. Modulation of one or more characteristics of a pulse carrier.

- GS coding
- . signal encoding
- . . **pulse modulation**
- . . . pulse amplitude modulation
- . . . pulse code modulation
- . . . . delta modulation
- . . . . differential pulse code modulation
- . . . pulse frequency modulation
- . . . pulse time modulation
- . . . . pulse duration modulation
- . . . . pulse position modulation
- modulation
- . **pulse modulation**
- . . pulse amplitude modulation
- . . pulse code modulation
- . . . delta modulation
- . . . differential pulse code modulation
- . . pulse frequency modulation
- . . pulse time modulation
- . . . pulse duration modulation
- . . . pulse position modulation
- RT amplitude modulation
- demodulation
- demodulators
- electric pulses
- electromagnetic missiles
- electromagnetic pulses
- frequency modulation
- light modulation
- modems
- modulators
- phase modulation
- pulse frequency modulation telemetry
- pulsed radiation
- radio telemetry
- time division multiplexing
- trigatrons

**pulse position modulation**

DEF A form of pulse time modulation in which the position in time of a pulse is varied. Also called pulse phase modulation. Used for PPM (modulation).

- UF *PPM (modulation)*
- GS coding

- . signal encoding
- . . pulse modulation
- . . . pulse time modulation
- . . . . **pulse position modulation**
- modulation
- . pulse modulation
- . . pulse time modulation
- . . . **pulse position modulation**
- RT modems

**pulse radar**

DEF A type of radar, designed to facilitate range measurement, in which the transmitted energy is emitted in periodic short pulses.

- GS radar
- . **pulse radar**
- . . pulse Doppler radar
- . . . monopulse radar
- . . . . Shuttle Imaging Radar
- RT coherent radar
- continuous wave radar
- Doppler radar
- echo suppressors
- electromagnetic pulses
- meteorological radar
- multistatic radar
- polystation doppler tracking system
- search radar
- surveillance radar
- synchronizers
- tracking radar

**pulse rate**

- SN (FOR CARDIOVASCULAR PULSE, USE HEART RATE)
- UF *chronotrons*
- GS rates (per time)
- . **pulse rate**
- . . pulse repetition rate
- RT electric pulses
- picosecond pulses
- pulsed radiation

*pulse recorders*

USE **counters**

**pulse repetition rate**

- GS rates (per time)
- . pulse rate
- . . **pulse repetition rate**
- RT frequency response
- optical pumping
- pulse duration
- pulse generators
- pulsed lasers

**pulse time modulation**

DEF Modulation in which the values of instantaneous samples of the modulating wave are caused to modulate the time of occurrence of some characteristic of a pulse carrier. Used for PTM (modulation).

- UF *PTM (modulation)*
- GS coding
- . signal encoding
- . . pulse modulation
- . . . **pulse time modulation**
- . . . . pulse duration modulation
- . . . . pulse position modulation
- modulation
- . pulse modulation
- . . **pulse time modulation**
- . . . pulse duration modulation
- . . . pulse position modulation

*pulse width*

USE **pulse duration**

**pulse width amplitude converters**

- RT ∞ converters
- frequency converters

*pulse width modulation*

USE **pulse duration modulation**

*pulsed arcjet engines*

(added March 2001)

USE **pulsed jet engines**

**pulsed inductive thrusters**

(added April 2001)

DEF Electromagnetic propulsion devices that accelerate a plasma propellant by the JxB Lorentz force, and in which the driving current in the plasma is induced, rather than being introduced through electrodes.

- UF *PIT (rocket engines)*
- GS engines
- . rocket engines
- . . electric rocket engines
- . . . plasma engines
- . . . . **pulsed inductive thrusters**
- RT electromagnetic propulsion
- plasma propulsion
- spacecraft propulsion
- ∞ thrusters

**pulsed jet engines**

DEF Arcjet engines that produce thrust by ejecting a pulsed, high velocity plasma out of a conventional supersonic nozzle. The pulsed arcjet geometry consists of a narrow cylindrical chamber or capillary upstream of the nozzle convergent section. A power supply is used to charge the capacitors of a pulse-forming-network. The power supply ramps up the voltage on the capacitors until the breakdown voltage of the propellant between the electrodes is reached, at which point an arc discharge initiates in the capillary between the electrodes.

- UF *pulsed arcjet engines*
- GS engines
- . rocket engines
- . . electric rocket engines
- . . . electrothermal engines
- . . . . arc jet engines
- . . . . . **pulsed jet engines**
- RT plasma engines
- resistojet engines

**pulsed laser deposition**

(added December 1992)

- GS deposition
- . laser deposition
- . . **pulsed laser deposition**
- utilization
- . laser applications
- . . laser deposition
- . . . **pulsed laser deposition**
- RT crystal growth
- epitaxy
- excimer lasers
- laser heating
- pulsed lasers
- superconducting films
- vapor deposition

**pulsed lasers**

- GS stimulated emission devices
- . lasers
- . . **pulsed lasers**
- . . . Q switched lasers
- . . . ultrashort pulsed lasers
- . . . ultraviolet lasers
- RT argon lasers
- carbon dioxide lasers
- gas lasers
- glass lasers
- inertial fusion (reactor)
- laser heating
- laser target interactions
- laser welding
- nitrogen lasers
- pulse repetition rate
- pulsed laser deposition
- ruby lasers
- semiconductor lasers
- TEA lasers
- tube lasers
- waveguide lasers

**pulsed plasma thrusters**

(added April 2001)

DEF Electromagnetic propulsion devices in which electrical power is used to ablate, ionize, and electromagnetically accelerate atoms and molecules from a block of solid propellant material.

- UF *PPT (rocket engines)*
- GS engines
- . rocket engines

## pulsed radiation

- . . electric rocket engines
- . . . plasma engines
- . . . . **pulsed plasma thrusters**

RT electromagnetic propulsion  
plasma propulsion  
spacecraft propulsion  
∞ thrusters

### pulsed radiation

GS **pulsed radiation**

- . electromagnetic pulses
- . . system generated electromagnetic pulses

RT continuous radiation  
corpuscular radiation  
elastic waves  
electromagnetic radiation  
gamma ray lasers  
laser damage  
lasers  
picosecond pulses  
pulse amplitude  
pulse diffraction  
pulse duration  
pulse generators  
pulse modulation  
pulse rate  
∞ radiation  
∞ rays

### pulsejet engines

DEF Compressorless jet engines in which combustion takes place intermittently producing thrust by a series of explosions, commonly occurring at the approximate resonance frequency of the engine.

- GS engines
- . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . ramjet engines
  - . . . . . **pulsejet engines**
  - . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . ramjet engines
  - . . . . . **pulsejet engines**
  - . turbine engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . ramjet engines
  - . . . . . **pulsejet engines**

RT detonation  
firing (igniting)  
V-1 missile

### pulses

DEF Short-wave trains of mechanical vibration.

- GS **pulses**
- . electric pulses
  - . electromagnetic pulses
  - . . system generated electromagnetic pulses
  - . geomagnetic pulsations
  - . . geomagnetic micropulsations
  - . micropulsations
  - . . geomagnetic micropulsations
  - . picosecond pulses
  - . pressure pulses

RT amplitudes  
intermittency  
solitary waves

### pultrusion

DEF Process of pulling continuous lengths of resin impregnated fiber through a shaped, heated die to produce lengths of reinforced plastic.

- GS forming techniques
- . extruding
  - . . **pultrusion**

RT casting  
composite structures  
dies  
epoxy matrix composites  
fiber composites  
glass fiber reinforced plastics  
hot working  
polymer matrix composites

- preimpregnation
- pressing (forming)
- resin matrix composites

### pulverizing

USE **grinding (comminution)**

### pumice

DEF A light-colored, vesicular, glassy rock commonly having the composition of a rhyolite.

- GS rocks
- . igneous rocks

RT abrasives

- . . **pumice**
- . obsidian
- . powder (particles)
- . soils

### pump impellers

- GS rotating bodies
- . rotors
  - . . impellers
  - . . . **pump impellers**
- RT centrifugal compressors  
centrifugal pumps

### pump seals

- GS seals (stoppers)
- . **pump seals**
- RT gaskets
- ∞ glands
  - . glands (seals)
  - . hermetic seals
  - . labyrinth seals
  - . molecular pumps

### ∞ pumping

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT blowing  
compressed air  
compressing  
cryopumping  
drainage  
electron pumping  
jet pumps  
laser pumping  
magnetic pumping  
maser pumping  
materials handling  
nuclear pumping  
optical pumping  
plasma pumping  
pumps  
purging  
windmills (windpowered machines)  
windpowered pumps

### pumps

- SN (LIMITED TO PUMPS FOR MATERIALS--EXCLUDES HEAT PUMPS)
- UF *hydraulic pumps*
- GS **pumps**
- . axial flow pumps
  - . . turbine pumps
  - . . blood pumps
  - . centrifugal pumps
  - . diffusion pumps
  - . electromagnetic pumps
  - . fuel pumps
  - . jet pumps
  - . rams (pumps)
  - . vacuum pumps
  - . . condensation pumps
  - . . ion pumps
  - . . molecular pumps
  - . viscopumps
  - . windpowered pumps

RT bellows  
centrifugal compressors  
ejectors  
feed systems  
heat pumps  
hydraulic equipment  
impellers  
injectors  
lubrication systems  
materials handling  
packings (seals)  
pipelines

- preburners
- ∞ pumping
- siphons
- stators
- turbomachinery
- vaneless diffusers

### punched cards

DEF Cards on which a pattern of holes or cuts is used to represent data.

- GS cards
- . **punched cards**
- RT computer storage devices  
data recorders  
data recording  
data storage  
readers

### punched tapes

DEF Tapes on which a pattern of holes or cuts is used to represent data.

- RT automatic typewriters  
computer storage devices  
data recording  
magnetic tapes  
readers
- ∞ tapes

### punches

- RT dies  
machine tools  
molds  
platens  
presses  
stamping

### puncturing

USE **piercing**

### pupa

- RT insects  
larvae

### pupil size

RT pupillometry

### pupillometry

- RT biometrics  
dark adaptation  
light adaptation
- ∞ measurement
  - . pupil size

### pupils

- GS anatomy
- . sense organs
  - . . eye (anatomy)
  - . . . **pupils**
- RT vision

### purging

- RT circulation  
clearing  
decontamination  
degassing  
distillation  
evacuating (vacuum)  
flushing  
outgassing
- ∞ pumping
  - . purification
  - . relieving
  - ∞ separation
  - . venting

### purification

- UF *purifiers*
- GS **purification**
- . air purification
- RT aeration  
antiseptics  
beneficiation  
chemical sterilization  
cleaning  
crystallization  
decontamination  
deminerallizing  
desalinization  
dissipation  
distillation

- elimination  
elution  
enrichment  
flushing  
getters  
pasteurizing  
polynuclear organic compounds  
potable water  
purging  
purity  
rectification  
∞ reduction  
reduction (chemistry)  
refining  
scavenging  
∞ separation  
sewage treatment  
solvent extraction  
spacecraft sterilization  
sterilization  
sublimation  
ultrapure metals  
upgrading  
washing  
water treatment  
zone melting
- purifiers*  
USE **purification**
- purines**  
GS organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . . **purines**  
. . . . . adenines  
. . . . . xanthines  
. . . . . caffeine  
. . . . . guanines  
. . . . . uric acid
- purity**  
RT clarity  
concentration (composition)  
contaminants  
contamination  
decontamination  
dilution  
fineness  
pollution  
potable liquids  
purification  
quality  
trace contaminants  
ultrapure metals  
water pollution
- purposes**  
RT goals
- pursuit tracking**  
GS tracking (position)  
. **pursuit tracking**  
RT infrared tracking  
pursuit-evasion games  
radar tracking  
satellite interceptors
- pursuit-evasion games**  
(added October 1998)  
GS games  
. **pursuit-evasion games**  
RT differential games  
evasive actions  
interception  
optimal control  
pursuit tracking  
trajectory optimization  
zero sum games
- pushbroom sensor modes**  
DEF Spacecraft instrument arrangements in which large numbers of detectors comprising linear arrays are swept by the forward motion of the spacecraft to attain increased fidelity and high sensitivity in the data captured.  
GS modes  
. **pushbroom sensor modes**  
RT arrays  
electro-optics
- image processing  
linear arrays  
photodiodes
- pushing**  
RT ∞ force  
propulsion
- push-pull amplifiers**  
DEF Amplifiers in which there are two identical signal branch circuits so as to operate in phase opposition and with input and output connections each balanced to ground. Used for balanced amplifiers.  
UF *balanced amplifiers*  
GS amplifiers  
. **push-pull amplifiers**  
RT phase modulation  
power amplifiers
- PWM (modulation)*  
USE **pulse duration modulation**
- pycnometers**  
RT density (mass/volume)
- pylon mounting**  
RT aerodynamic configurations  
aircraft structures  
columns (supports)  
rigid mounting  
structural members  
supports  
wind tunnel models
- pylons**  
GS supports  
. **pylons**  
RT columns (supports)  
structural members  
struts  
towers
- Pyramid Lake (NV)**  
GS lakes  
. **Pyramid Lake (NV)**  
RT Nevada  
water management  
water resources
- pyramidal bodies**  
RT ∞ bodies  
pyramids  
reentry vehicles
- pyramids**  
GS geometry  
. Euclidean geometry  
. . polyhedrons  
. . . **pyramids**  
RT frustums  
pyramidal bodies
- pyranometers**  
DEF Actinometers which measure the combined intensity of incoming direct solar radiation and diffuse sky radiation. The pyranometers consist of a recorder and a radiation sensing element which is mounted so that it views the entire sky. Sometimes called solarimeters.  
GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . **pyranometers**  
RT photometers  
radiometers  
sky radiation
- pyrazines**  
DEF Compounds that contain a six-membered heterocyclic ring containing nitrogen atoms in the 1 and 4 positions.  
GS **pyrazines**  
. azines  
. . cyanurates  
. . cyanuric acid  
. . meclizine  
. . methylene blue
- . . phenothiazines
- Pyrenees Mountains (Europe)**  
GS landforms  
. mountains  
. . **Pyrenees Mountains (Europe)**  
RT Andorra  
France  
Spain
- pyrenes**  
GS organic compounds  
. hydrocarbons  
. . **pyrenes**
- Pyrex (trademark)*  
USE **borosilicate glass**
- pyridine nucleotides**  
GS organic compounds  
. nucleotides  
. . **pyridine nucleotides**  
phosphorus compounds  
. phosphates  
. . **pyridine nucleotides**
- pyridines**  
DEF Compounds that contain a six-membered heterocyclic ring containing one nitrogen atom.  
GS bases (chemical)  
. **pyridines**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **pyridines**  
RT Karl Fischer reagent  
piperidine  
quinoline
- pyridoxine**  
UF *vitamin B 6*  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **pyridoxine**  
vitamins  
. **pyridoxine**
- pyrimidines**  
DEF Compounds that contain a six-membered heterocyclic ring containing nitrogen atoms in the 1 and 3 positions.  
GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **pyrimidines**  
. . . . alloxan  
. . . . thymidine  
. . . . thymine  
. . . . uracil
- pyrites**  
GS chalcogenides  
. sulfides  
. . **pyrites**  
iron compounds  
. **pyrites**  
minerals  
. **pyrites**  
sulfur compounds  
. sulfides  
. . **pyrites**
- Pyroceram (trademark)**  
GS ceramics  
. **Pyroceram (trademark)**  
glass  
. **Pyroceram (trademark)**
- pyroelectricity**  
GS electrical properties  
. **pyroelectricity**  
thermodynamic properties  
. thermophysical properties  
. . **pyroelectricity**  
RT piezoelectricity  
polarization (charge separation)
- pyrogen**  
GS gases

## pyroheliometers

- . flammable gases
- . . **pyrogen**
- RT torches

### pyrographalloy

- USE **composite materials**
- pyrolytic graphite**
- refractory materials**

### pyroheliometers

DEF Actinometers which measure the intensity of direct solar radiation, consisting of a radiation sensing element enclosed in a casing which is closed except for a small aperture, through which the direct solar rays enter, and a recorder unit. Used for heliometry.

- UF *heliometry*
- GS measuring instruments
- . heliometers
- . . **pyroheliometers**
- optical equipment
- . heliometers
- . . **pyroheliometers**
- telescopes
- . heliometers
- . . **pyroheliometers**

### pyrohydrolysis

DEF Decomposition by the action of heat and water vapor.

- GS chemical reactions
- . **pyrohydrolysis**
- RT pyrolysis

### pyrolysis

DEF Chemical decomposition by the action of heat.

- GS chemical reactions
- . cracking (chemical engineering)
- . . **pyrolysis**
- . thermal decomposition
- . . **pyrolysis**
- decomposition
- . cracking (chemical engineering)
- . . **pyrolysis**
- . thermal decomposition
- . . **pyrolysis**
- RT ablation
- endothermic reactions
- exothermic reactions
- pyrohydrolysis
- thermal absorption
- thermal degradation
- thermal instability
- thermogravimetry

### pyrolytic graphite

- UF *pyrographalloy*
- GS carbonaceous materials
- . graphite
- . . **pyrolytic graphite**
- minerals
- . graphite
- . . **pyrolytic graphite**
- pyrolytic materials
- . **pyrolytic graphite**
- RT heat shielding

### pyrolytic materials

- GS **pyrolytic materials**
- . pyrolytic graphite
- RT ablative materials

- ceramics
- ∞ materials
- refractory coatings
- refractory materials

### pyrometallurgy

- RT aérothermochemistry
- alloying
- chlorination
- ∞ converters
- heat balance
- metal working
- ∞ metallurgy
- refining
- sintering
- sublimation
- thermochemistry

### pyrometers

DEF Instruments that measure high temperature, e.g., of molten lavas, by electrical or optical means.

- GS measuring instruments
- . temperature measuring instruments
- . . **pyrometers**
- . . . radiation pyrometers
- . . . thermocouple pyrometers
- RT temperature measurement

### pyrometry

- USE **temperature measurement**

### pyrophoric materials

- RT explosives
- flammability
- hypergolic rocket propellants
- igniters
- ignition temperature
- ∞ materials
- metal combustion
- solid propellant ignition
- spontaneous combustion

### pyrophyllite

DEF A white, greenish, gray, or brown phyllosilicate mineral that resembles talc.

- GS aluminum compounds
- . aluminum silicates
- . . **pyrophyllite**
- minerals
- . **pyrophyllite**
- silicon compounds
- . silicates
- . . aluminum silicates
- . . . **pyrophyllite**
- RT aluminum oxides

### pyrotechnics

- UF *fireworks*
- GS **pyrotechnics**
- . HMX
- RT ammunition
- bombs (ordnance)
- chemical fuels
- double base propellants
- explosives
- ∞ flares
- grenades
- illuminating
- incendiary ammunition
- initiators (explosives)
- ordnance

- plastic propellants
- projectiles
- RDX
- ∞ rockets
- ∞ signals
- thermites

### pyroxenes

DEF A group of dark, rock-forming silicate minerals.

- GS chalcogenides
- . oxides
- . . **pyroxenes**
- . . . enstatite
- minerals
- . **pyroxenes**
- . . enstatite
- silicon compounds
- . silicates
- . . **pyroxenes**
- . . . enstatite
- RT eclogite
- igneous rocks
- regolith
- rocks
- soils

### pyroxylin

- USE **cellulose nitrate**

### pyrrhotite

DEF A common reddish-brown to bronze hexagonal mineral.

- GS chalcogenides
- . sulfides
- . . **pyrrhotite**
- . . . troilite
- iron compounds
- . **pyrrhotite**
- . . troilite
- minerals
- . **pyrrhotite**
- . . troilite
- sulfur compounds
- . sulfides
- . . **pyrrhotite**
- . . . troilite

### pyrroles

DEF Compounds that contain a five-membered heterocyclic ring containing one nitrogen atom.

- GS organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . azoles
- . . . . **pyrroles**
- . . . . . carbazoles
- RT indoles
- methoxy systems
- polypyrroles
- thiophenes

### Pyrrones (trademark)

- GS nitrogen compounds
- . nitrogen polymers
- . . **Pyrrones (trademark)**
- RT ∞ polymers

### pyruvates

- RT organic liquids

# Q

## Q devices

- RT magnetic mirrors
- plasma pinch
- zeta pinch

## Q factors

- UF *high Q*
- quality factors*
- RT figure of merit
- resonant vibration
- spectral resolution
- tuning

## Q switched lasers

DEF A device for producing very short (about 30 ns) intense laser pulses by enhancing the storage and dumping of electronic energy in and out of the lasing medium.

- GS stimulated emission devices
  - . lasers
  - . . pulsed lasers
  - . . . **Q switched lasers**
- RT argon lasers
- carbon dioxide lasers
- chemical lasers
- gas lasers
- ruby lasers
- semiconductor lasers
- solid state lasers

## Q values (nuclear physics)

- GS value
  - . **Q values (nuclear physics)**
- RT fusion reactors
- storage rings (particle accelerators)
- thermonuclear reactions
- tokamak devices

## QAM (modulation)

USE **quadrature amplitude modulation**

## Qatar

- (added February 1989)
- GS nations
  - . **Qatar**
- RT Asia

## QBO (climatology)

(added May 2001)

USE **quasi-biennial oscillation**

## QCD

USE **quantum chromodynamics**

## QH-50 helicopter

- UF *Dash helicopter*
- DSN helicopter*
- Gyrodyne DSN-3 helicopter*
- Gyrodyne military aircraft*
- GS Gyrodyne aircraft
  - . **QH-50 helicopter**
  - V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . military helicopters
  - . . . . **QH-50 helicopter**

## QHE (electronics)

(added July 2000)

USE **quantum Hall effect**

## QPSK

USE **quadrature phase shift keying**

## QSO (radio sources)

USE **quasars**

## Quadrantid meteoroids

- GS celestial bodies
  - . meteoroid showers
  - . . **Quadrantid meteoroids**
  - . meteoroids
  - . . **Quadrantid meteoroids**

## quadrants

- GS geometry
  - . Euclidean geometry
  - . . analytic geometry

## . . . quadrants

## quadrature phase shift keying

USE **quadrature phase shift keying**

## quadratic equations

- GS algebra
  - . nonlinear equations
  - . . **quadratic equations**
  - analysis (mathematics)
  - . real variables
  - . . nonlinear equations
  - . . . **quadratic equations**
  - field theory (algebra)
  - . **quadratic equations**
- RT  $\infty$  equations
- polynomials

## quadratic programming

- GS optimization
  - . mathematical programming
  - . . **quadratic programming**
  - research
  - . **quadratic programming**
- RT  $\infty$  programming

## quadrature amplitude modulation

(added August 1991)

DEF Amplitude modulation in which the signal is 90 degrees out of phase with the carrier which it modulates.

- UF *QAM (modulation)*
- GS coding
  - . signal encoding
  - . . amplitude modulation
  - . . . **quadrature amplitude modulation**
  - modulation
  - . amplitude modulation
  - . . **quadrature amplitude modulation**
- RT phase shift keying
- quadrature phase shift keying

## quadrature approximation

USE **quadratures**

## quadrature phase shift keying

(added May 1991)

- UF *QPSK*
- quadrature phase shift keying*
- GS coding
  - . signal encoding
  - . . phase modulation
  - . . . phase shift keying
  - . . . . **quadrature phase shift keying**
  - keying
  - . phase shift keying
  - . . **quadrature phase shift keying**
  - modulation
  - . phase modulation
  - . . phase shift keying
  - . . . **quadrature phase shift keying**
- RT binary phase shift keying
- quadrature amplitude modulation
- satellite transmission

## quadratures

DEF Elongations of 90 deg., usually specified as east or west in accordance with the direction of the body from the sun. The moon is a quadrature at first and last quarters. The situation of two periodic quantities differing by a quarter of a cycle. Used for quadrature approximation.

- UF *quadrature approximation*
- RT circular orbits
- orbit calculation
- orbital mechanics
- orbits
- space mechanics

## quadrupole lenses

USE **magnetic lenses**

## quadrupole networks

- GS networks

## . quadrupole networks

## quadrupoles

DEF A linear accelerator having four longitudinal vanes in its resonating cavity, which are shaped to create RF electric fields that simultaneously accelerate, bunch, and focus the charged particle beam.

- RT  $\infty$  dipoles
- nuclear quadrupole resonance
- polarity

## quail missile

- GS decoys
  - . **quail missile**
  - missiles
  - . air to surface missiles
  - . . **quail missile**
- RT countermeasures
- turbojet engines

## qualifications

- RT certification
- contractors
- education
- experience
- fitness
- personality tests
- personnel
- $\infty$  tests

## qualitative analysis

DEF An analysis in which some or all of the components of a sample are identified.

- GS chemical tests
  - . chemical analysis
  - . . **qualitative analysis**
- RT analytical chemistry
- electrophotometry
- flame spectroscopy
- gas analysis
- inductively coupled plasma mass spectrometry
- mass spectrometers
- microanalysis
- neutron activation analysis
- quantitative analysis
- spectroscopic analysis

## quality

- GS **quality**
  - . environmental quality
  - . . air quality
  - . . water quality
  - . riding quality
- RT accuracy
- adequacy
- appearance
- computer systems performance
- concentration (composition)
- consistency
- contaminants
- controllability
- durability
- evaluation
- figure of merit
- fineness
- flight characteristics
- $\infty$  grade
- impurities
- $\infty$  materials tests
- $\infty$  performance
- pollution
- precision
- product development
- purity
- reliability
- $\infty$  resistance
- specifications
- stability
- $\infty$  tests
- total quality management
- upgrading
- validity
- variability

## quality control

DEF An aggregate of functions designed to insure adequate quality in manufactured prod-

## quantiles

ucts by initial critical study of engineering design, materials, processes, equipment, and workmanship followed by periodic inspection and analysis. Used for reliability control.

UF *reliability control*  
GS **quality control**  
. Taguchi methods  
. total quality management  
RT accelerated life tests  
acceptability  
aircraft reliability  
assurance  
average  
Bayes theorem  
burn-in  
certification  
chemical tests  
circuit reliability  
component reliability  
confidence  
confidence limits  
construction  
∞ control  
correlation  
correlation coefficients  
covariance  
data sampling  
degrees of freedom  
electrical properties  
electronic equipment tests  
error detection codes  
errors  
estimates  
estimating  
experiment design  
extrapolation  
hypotheses  
infrared inspection  
inspection  
least squares method  
lessons learned  
linear prediction  
low temperature tests  
Mann-Whitney-Wilcoxon U test  
∞ materials tests  
mean  
median (statistics)  
mode (statistics)  
nondestructive tests  
normalizing (statistics)  
operations research  
optimization  
orthogonal functions  
orthogonality  
precision  
probability theory  
process control (industry)  
∞ processes  
product development  
production management  
products  
random errors  
random sampling  
range (extremes)  
regression analysis  
regression coefficients  
reliability  
reliability engineering  
sampling  
scheduling  
sequential analysis  
spacecraft reliability  
specifications  
standard deviation  
standardization  
standards  
static tests  
statistical analysis  
statistical correlation  
statistical distributions  
statistical tests  
structural reliability  
∞ systems  
task complexity  
tasks  
∞ tests  
tolerances (mechanics)  
ultrasonic flaw detection  
value engineering

variability  
variance (statistics)  
wear tests

quality factors  
USE **Q factors**

### quantiles

DEF The values that mark frequency distribution interval boundaries that are determined by arranging a set of N observations in order of magnitude and marking off equal parts (N/P) of the total population P.

GS statistical analysis  
. **quantiles**  
RT mathematical models  
statistical distributions  
∞ statistics  
symmetry

### quantitative analysis

GS chemical tests  
. chemical analysis  
. . **quantitative analysis**  
. . . Kjeldahl method  
. . . Van Slyke method  
RT analytical chemistry  
chromatography  
electrophotometry  
gas analysis  
gravimetry  
iodimetry  
Karl Fischer reagent  
microanalysis  
neutron activation analysis  
polarography  
qualitative analysis  
radiochemical separation  
spectroscopic analysis  
volumetric analysis

quantity  
USE **amount**

quantization  
USE **measurement**

quantizer  
USE **counters**

### quantum amplifiers

GS amplifiers  
. **quantum amplifiers**  
RT lasers  
light amplifiers  
two-wavelength lasers  
ultrashort pulsed lasers  
ultraviolet lasers

### quantum cascade lasers

(added February 2003)

DEF Semiconductor injection lasers in which light is generated by electrons making optical transitions between subbands within one band of a semiconductor heterostructure; these subbands result from the quantization of this motion in coupled quantum wells.

GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . semiconductor lasers  
. . . . **quantum cascade lasers**  
. . solid state lasers  
. . . **quantum cascade lasers**  
stimulated emission devices  
. lasers  
. . injection lasers  
. . . **quantum cascade lasers**  
. . semiconductor lasers  
. . . **quantum cascade lasers**  
. . solid state lasers  
. . . **quantum cascade lasers**  
RT heterojunctions  
infrared lasers  
quantum well lasers  
quantum wells

### quantum chemistry

GS physical chemistry  
. **quantum chemistry**

RT ∞ chemistry  
molecular orbitals  
nuclear chemistry  
quantum mechanics

### quantum chromodynamics

DEF A gauge theory describing the interaction between quarks and gluons. Used for color (particle physics) and QCD.

UF *color (particle physics)*  
*QCD*  
GS field theory (physics)  
. gauge theory  
. . **quantum chromodynamics**  
RT ∞ dynamics  
gluons  
instantons  
leptons  
particle interactions  
quantum mechanics  
quark models  
quarks  
standard model (particle physics)  
string theory  
strong interactions (field theory)  
∞ theories

### quantum communication

(added March 2000)

DEF Any form of communication that depends on coherent quantum-mechanical effects (quantum interference or quantum entanglement) to transmit, protect or authenticate information, or to perform distributed computational tasks.

GS telecommunication  
. communication  
. . **quantum communication**  
RT communication theory  
optical communication  
quantum computation

### quantum computation

(added March 2000)

DEF Any form of information processing that depends on coherent quantum-mechanical effects (quantum interference or quantum entanglement) to perform computational tasks.

UF *quantum computing*  
GS computation  
. **quantum computation**  
RT quantum communication  
quantum computers  
quantum cryptography  
quantum mechanics  
Turing machines

### quantum computers

(added March 2000)

DEF Devices capable of performing quantum computations. There are many proposals for the physical basis of quantum computers. The 0 and 1 of a quantum bit (i.e., qubit) could be the ground and excited states of an atom in a linear ion trap; the polarizations of photons interacting in an optical cavity; or the excess of one nuclear spin state over another in a liquid sample in an NMR machine.

GS data processing equipment  
. computers  
. . **quantum computers**  
RT quantum computation

### quantum computing

(added March 2000)

USE **quantum computation**

### quantum counters

GS measuring instruments  
. counters  
. . radiation counters  
. . . **quantum counters**  
. radiation measuring instruments  
. . radiation counters  
. . . **quantum counters**  
RT squid (detectors)

### quantum cryptography

(added March 2000)

DEF Any form of cryptography that depends

for its security on coherent quantum-mechanical effects (quantum interference or quantum entanglement).

- GS cryptography
  - . **quantum cryptography**
- RT computer information security
  - quantum computation

#### quantum dots

(added October 1997)

DEF Small (30 nm to 1 micron) metal or semiconductor structures that hold a discrete number of electrons; the number of electrons can be altered by modifying the electrostatic environment of the dot.

- GS nanostructures (devices)
  - . **quantum dots**
- RT electron tunneling
  - nanotechnology
  - nonlinear optics
  - quantum electronics
  - quantum wells
  - quantum wires
  - semiconductor devices
  - semiconductor lasers
  - single electron transistors

#### quantum efficiency

DEF A measure of the efficiency of conversion or utilization of light or some other form of energy.

- RT energy conversion efficiency
  - energy technology
  - heterojunction devices
  - laser outputs
  - solar cells
  - volt-ampere characteristics

#### quantum electrodynamics

- GS electrodynamics
  - . **quantum electrodynamics**
  - mechanics (physics)
  - . quantum mechanics
  - . . **quantum electrodynamics**
- RT electromagnetic fields
  - Feynman diagrams
  - field theory (physics)
  - Landau-Ginzburg equations
  - resonance fluorescence
  - self consistent fields

#### quantum electronics

DEF The area of physics dealing with the effects of quantum mechanics on the behavior of electrons in matter, and their interactions with photons. The field also encompasses the basic processes of laser operation where photons are interacting with electrons.

- RT coherent electromagnetic radiation
  - ∞ electronics
  - laser applications
  - lasers
  - nanofabrication
  - nanostructures (devices)
  - nanotechnology
  - nanowires
  - quantum dots
  - quantum Hall effect
  - quantum mechanics
  - quantum optics
  - quantum theory
  - quantum wires
  - resonant tunneling
  - resonant tunneling diodes
  - ∞ solid state physics
  - tunnel junctions

#### quantum generators

- USE **stimulated emission devices**

#### quantum Hall effect

(added July 2000)

DEF Phenomenon where the Hall resistance of a two-dimensional electron system at low temperature and high magnetic fields, becomes quantized as  $h/(e^2)$ , where  $h$  is Planck's constant,  $e$  is the electronic charge, and  $j$  is either an integer or a rational fraction.

- UF **QHE (electronics)**
- GS galvanomagnetic effects

- . Hall effect
- . . **quantum Hall effect**
- RT electron gas
  - Hall resistance
  - magnetic effects
  - quantum electronics
  - semiconductor devices
  - superlattices

#### quantum mechanics

- GS mechanics (physics)
  - . **quantum mechanics**
  - . . Pauli exclusion principle
  - . . quantum electrodynamics
- RT atomic interactions
  - Bethe-Salpeter equation
  - Born approximation
  - density functional theory
  - Dyson theory
  - electromagnetic interactions
  - energy distribution
  - Fermi-Dirac statistics
  - function space
  - group velocity
  - Hylleraas coordinates
  - light-cone expansion
  - Orr-Sommerfeld equations
  - phase velocity
  - quantum chemistry
  - quantum chromodynamics
  - quantum computation
  - quantum electronics
  - quantum optics
  - Racah coefficient
  - relativity
  - squeezed states (quantum theory)
  - statistical mechanics
  - strangeness
  - U spin space
  - wave packets
  - Wigner coefficient

#### quantum numbers

DEF A number assigned to one of the various values of a quantized quantity in its discrete range. The quantum numbers arise from the mathematics of the wave equations. When the quantity has a quantum, the quantum number is the number of such quanta. A state may be described by giving a sufficient set of compatible numbers. In the customary formulations, each quantum number is either an integer (which may be positive, negative, or zero) or an odd half-integer.

- RT angular momentum
  - electrons
  - energy levels
  - nuclear spin
- ∞ numbers
  - parity
  - selection rules (nuclear physics)

#### quantum optics

- RT atom optics
  - nonlinear optics
- ∞ optics
  - physical optics
  - quantum electronics
  - quantum mechanics
  - quantum theory

#### quantum statistics

- UF **Bose-Einstein statistics**
- RT bosons
  - Fermi-Dirac statistics
  - fermions
  - many body problem
  - ∞ statistics
  - superfluidity
  - Thomas-Fermi model

#### quantum theory

DEF The theory first stated by Max Planck (before the Physical Society of Berlin on December 14, 1900) that all electromagnetic radiation is emitted and absorbed in quanta, each of magnitude  $h\nu$ ,  $h$  being the Planck constant and  $\nu$  the frequency of the radiation. Used for Wightman theory.

- UF **Wightman theory**

- GS theoretical physics
  - . **quantum theory**
  - . . Bohr theory
- RT angular momentum
  - atomic theory
  - charm (particle physics)
  - de Broglie wavelengths
  - Dirac equation
  - electroweak model
  - elementary particles
  - emission
  - energy levels
  - field theory (physics)
  - flavor (particle physics)
  - forbidden transitions
  - ground state
  - Hamiltonian functions
  - Klein-Dunham potential
  - magnetic monopoles
  - Mandelstam representation
  - nuclear physics
  - nuclear spin
  - parity
  - perturbation theory
  - photons
  - physical optics
  - Planck's constant
  - quantum electronics
  - quantum optics
  - ∞ radiation
    - radiation laws
    - Schumann-Runge bands
    - squeezed states (quantum theory)
    - standard model (particle physics)
    - statistical distributions
    - statistical mechanics
    - string theory
    - supergravity
    - supersymmetry
  - ∞ theories
    - wave equations

#### quantum well infrared photodetectors

(added August 2007)

DEF Infrared photodetectors made from semiconductor materials which contain one or more quantum wells.

- UF **QWIP**
- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . **quantum well infrared photodetectors**
  - measuring instruments
    - . optical measuring instruments
    - . . photometers
    - . . . **quantum well infrared photodetectors**
    - radiation measuring instruments
      - . . actinometers
      - . . . radiometers
      - . . . . infrared detectors
      - . . . . . **quantum well infrared photodetectors**
      - . . infrared instruments
      - . . . infrared detectors
      - . . . . **quantum well infrared photodetectors**
      - . . photometers
      - . . . **quantum well infrared photodetectors**
      - optical equipment
        - . optical measuring instruments
        - . . photometers
        - . . . **quantum well infrared photodetectors**
  - RT focal plane devices
    - gallium arsenides
    - quantum wells
    - thermal mapping
    - thermography

#### quantum well lasers

(added September 1993)

- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . semiconductor lasers
  - . . . . **quantum well lasers**



## quantum wells

- . . solid state lasers
- . . . **quantum well lasers**
- stimulated emission devices
- . lasers
- . . semiconductor lasers
- . . . **quantum well lasers**
- . . solid state lasers
- . . . **quantum well lasers**

RT energy gaps (solid state)  
heterojunction devices  
indium gallium arsenides  
indium phosphides  
laser materials  
quantum cascade lasers  
quantum wells  
waveguide lasers

### quantum wells

DEF Effective potential wells created by a minimum in the conduction band or a maximum in the valence band that arises when a smaller band-gap semiconductor is sandwiched between a larger band-gap semiconductor.

GS potential energy

- . electric potential
- . . **quantum wells**
- . . . photoexcitation

RT band structure of solids  
binding energy  
blue shift  
conduction bands  
conduction electrons  
energy bands  
energy gaps (solid state)  
gaps  
heterojunction devices  
heterojunctions  
quantum cascade lasers  
quantum dots  
quantum well infrared photodetectors  
quantum well lasers  
quantum wires  
resonant tunneling  
resonant tunneling diodes  
valence

### quantum wires

(added October 1997)

GS nanostructures (devices)

- . nanowires
- . . **quantum wires**

RT nanotechnology  
nonlinear optics  
quantum dots  
quantum electronics  
quantum wells  
semiconductor devices  
semiconductor lasers

### Quaoar

(added October 2002)

DEF Kuiper Belt object about 1,250 km in diameter and about 43 Astronomical Units from the Sun.

GS celestial bodies

- . asteroids
- . . **Quaoar**
- . trans-Neptunian objects
- . . **Quaoar**

RT asteroid belts  
Kuiper belt  
solar system

### quark models

GS models

- . **quark models**
- . . quark parton model

RT flavor (particle physics)  
particle theory  
quantum chromodynamics  
quarks  
standard model (particle physics)

### quark parton model

DEF A theoretical model which summarizes our understanding of how protons and neutrons are made up of the fundamental subparticles called quarks.

GS models

- . quark models

. . **quark parton model**

RT hadrons  
inelastic scattering  
leptons  
nuclear models  
partons  
quarks

### quarks

GS particles

- . elementary particles
- . . hypothetical particles
- . . . **quarks**

RT flavor (particle physics)  
gluons  
instantons  
partons  
quantum chromodynamics  
quark models  
quark parton model

### quarries

USE **mines (excavations)**

### quartic equations

GS algebra

- . nonlinear equations
- . . **quartic equations**
- analysis (mathematics)
- . real variables
- . . nonlinear equations
- . . . **quartic equations**

RT  $\infty$  equations

### quartiles

RT probability density functions  
statistical analysis  
statistical distributions

### quartz

DEF Crystalline silica, an important rock-forming mineral.

GS chalcogenides

- . oxides
- . . dioxides
- . . . silicon dioxide
- . . . . **quartz**
- . . . . . coesite
- . . . . . stishovite
- . . silicon oxides
- . . . silicon dioxide
- . . . . **quartz**
- . . . . . coesite
- . . . . . stishovite
- minerals
- . **quartz**
- . . coesite
- . . stishovite
- silicon compounds
- . silicon oxides
- . . silicon dioxide
- . . . **quartz**
- . . . . coesite
- . . . . . stishovite

RT abrasives  
felsite  
flint  
igneous rocks  
rocks  
sands  
soils

### quartz crystals

GS crystals

- . **quartz crystals**

RT frequency control  
frequency stability  
radio transmitters  
silicon dioxide

### quartz lamps

GS lighting equipment

- . luminaires
- . . **quartz lamps**

### quartz transducers

GS transducers

- . **quartz transducers**

RT piezoelectric crystals

pressure sensors

### quartzite

GS rocks

- . metamorphic rocks
- . . **quartzite**

### quasars

UF *QSO (radio sources)*  
*quasi-stellar radio sources*

GS celestial bodies

- . radio sources (astronomy)
- . . **quasars**

RT active galactic nuclei  
active galaxies  
blazars  
extragalactic radio sources  
galaxies  
gravitational collapse  
irregular galaxies  
pulsars  
radio astronomy  
radio bursts  
radio emission  
radio galaxies  
radio jets (astronomy)  
radio stars  
stars  
x ray spectra

### Quasat

SN (QUASAR SATELLITE)

GS artificial satellites

- . scientific satellites
- . . astronomical satellites
- . . . **Quasat**
- observatories
- . astronomical observatories
- . . astronomical satellites
- . . . **Quasat**

RT European space programs  
NASA programs  
radio astronomy  
radio telescopes  
spaceborne astronomy  
very long base interferometry

### quasi-biennial oscillation

(added May 2001)

DEF A natural, quasi-periodic (2-2.5 years) oscillation of the zonal (east-west) stratospheric winds over the equatorial region. The quasi-biennial oscillation (QBO) affects stratospheric temperatures and trace gases (including ozone) and influences the response of the stratosphere to volcanic eruptions.

UF *QBO (climatology)*

GS oscillations

- . **quasi-biennial oscillation**
- variations
- . periodic variations
- . . **quasi-biennial oscillation**

RT annual variations  
atmospheric circulation  
atmospheric temperature  
climatology  
el Nino  
equatorial atmosphere  
ozone  
Southern Oscillation  
tropical meteorology  
zonal flow (meteorology)

### quasilinearity

USE **nonlinearity**

### quasi-particles

USE **elementary excitations**

### quasi-steady states

RT equilibrium flow  
fluid dynamics  
nonequilibrium flow  
steady flow  
steady state creep

uniform flow

*quasi-stellar radio sources*  
USE **quasars**

#### quaternary alloys

GS alloys  
. **quaternary alloys**  
RT alloying

#### Quaternary period

(*added May 2001*)  
DEF A period (sub-era) within the Cenozoic era, beginning about two million years ago and extending to the present. It is divided into two epochs--Holocene and Pleistocene.

GS Cenozoic Era  
. **Quaternary period**  
. . Holocene epoch  
. . Pleistocene epoch  
RT geochronology  
Tertiary Period

#### quaternions

RT classical mechanics  
number theory

#### Quebec

GS nations  
. Canada  
. . **Quebec**

#### quefrecies

DEF In cepstral analysis, the frequency of periodic ripples in a spectra of a signal that contains echoes. Quefrecies are expressed in cycles per hertz or in seconds.

GS frequencies  
. acoustic frequencies  
. . audio frequencies  
. . . **quefrecies**  
RT cepstra

#### ∞ quenching

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT extinguishing  
quenching (atomic physics)  
quenching (cooling)  
rapid quenching (metallurgy)

#### quenching (atomic physics)

DEF Phenomena in which very strong electric fields cause the orbit of an electron or atom to precess rapidly so the average magnetic moment associated with its orbit angular momentum is reduced to zero.

GS gyration  
. precession  
. . **quenching (atomic physics)**  
RT angular momentum  
laser cooling

magnetic moments  
particle spin  
∞ physics  
∞ quenching

#### quenching (cooling)

DEF Rapid cooling as in metallurgy. Used for flame quenching.

UF *flame quenching*  
GS cooling  
. **quenching (cooling)**  
. . rapid quenching (metallurgy)

RT baths  
combustion  
dipping  
extinguishing  
hardening (materials)  
heat treatment  
microstructure  
∞ quenching  
submerging  
supercooling  
supersaturation  
thermomechanical treatment  
water immersion

#### query languages

DEF Command languages used to search and retrieve information.

GS languages  
. command languages  
. . **query languages**  
RT human-computer interface  
information retrieval

#### Questol aircraft

(*added December 1990*)  
SN (EXPERIMENTAL STOL TRANSPORT RESEARCH AIRPLANE)  
UF *experimental STOL transport rsch airplane*  
GS research vehicles  
. research aircraft  
. . **Questol aircraft**  
V/STOL aircraft  
. short takeoff aircraft  
. . **Questol aircraft**  
RT ∞ aircraft  
NASA programs

#### queueing theory

RT ARPA computer network  
bunching  
mathematical models  
operations research  
statistical analysis  
stochastic processes  
∞ theories

#### quiet engine program

GS programs  
. NASA programs  
. . **quiet engine program**

RT aircraft engines  
engine noise  
jet aircraft noise  
jet engines  
noise reduction

#### QuikSCAT satellite

(*added May 2003*)  
DEF A remote sensing satellite designed to measure wind speed and direction over the global oceans and to monitor coastal zones and polar regions. Launched in June 1999.

GS artificial satellites  
. scientific satellites  
. . **QuikSCAT satellite**  
RT ocean dynamics  
scatterometers  
wind measurement

#### quinoline

GS bases (chemical)  
. **quinoline**  
nitrogen compounds  
. **quinoline**  
organic compounds  
. **quinoline**  
RT alkaloids  
drugs  
pyridines

#### quinones

(*added November 1992*)  
UF *benzoquinone chinone*  
GS organic compounds  
. **quinones**  
RT ketones

#### quinoxalines

DEF A group of heterocyclic compounds consisting of a benzene ring condensed with a diazine ring.

GS organic compounds  
. hydrocarbons  
. . **quinoxalines**  
plastics  
. synthetic resins  
. . thermoplastic resins  
. . . **quinoxalines**  
resins  
. synthetic resins  
. . thermoplastic resins  
. . . **quinoxalines**  
RT polymerization

#### quotients

RT dividing (mathematics)

#### QWIP

(*added August 2007*)  
USE **quantum well infrared photodetectors**

# R

## R Coronae Borealis stars

- UF *RCB stars*
- GS celestial bodies
  - . stars
  - . . . . . supergiant stars
  - . . . . . **R Coronae Borealis stars**
  - . . . . . variable stars
  - . . . . . irregular variable stars
  - . . . . . **R Coronae Borealis stars**
- RT carbon stars
  - . cool stars
  - . dust
  - . stellar envelopes
  - . stellar mass ejection

## R5D aircraft

- USE **C-54 aircraft**

## R7V aircraft

- USE **C-121 aircraft**

## RA-28 engine

- GS engines
  - . air breathing engines
  - . . . . . gas turbine engines
  - . . . . . jet engines
  - . . . . . turbojet engines
  - . . . . . **RA-28 engine**
  - . internal combustion engines
    - . . . . . gas turbine engines
    - . . . . . jet engines
    - . . . . . turbojet engines
    - . . . . . **RA-28 engine**
    - . turbine engines
      - . . . . . gas turbine engines
      - . . . . . jet engines
      - . . . . . turbojet engines
      - . . . . . **RA-28 engine**

## rabbits

- GS animals
  - . vertebrates
  - . . . . . mammals
  - . . . . . rodents
  - . . . . . **rabbits**

## Racah coefficient

- RT angular momentum
  - . coefficients
  - . coupling
  - . quantum mechanics
  - . transformations (mathematics)

## race factors

- RT anthropology
  - . culture (social sciences)
  - . ethnic factors
  - . human beings
  - . human performance
  - . races (anthropology)
  - . social factors
  - . sociology
- ∞ variable

## races (anthropology)

- RT American Indians
  - . anthropology
  - . culture (social sciences)
  - . human beings
  - . minorities
  - . race factors

## racetracks (particle accelerators)

- RT ∞ accelerators
  - . electromagnets
  - . magnetic fields
  - . particle acceleration
  - . particle accelerators
  - . particle trajectories

## ∞ racks

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT racks (frames)
- . racks (gears)

## racks (frames)

- RT ∞ racks
- ∞ shelves

- ∞ storage
- . supports

## racks (gears)

- GS gears
  - . . . . . **racks (gears)**
- RT ∞ racks
  - . translational motion

## racon beacons

- USE **radar beacons**

## radant

- GS antennas
  - . directional antennas
  - . . . . . radar antennas
  - . . . . . **radant**
- . radar equipment
  - . . . . . radar antennas
  - . . . . . **radant**
- RT radar filters
  - . radomes
  - . slot antennas
  - . waveguide antennas

## radar

(added January 1991)  
 DEF A method, system or technique of using beamed, reflected, and timed radio waves for detecting, locating, or tracking objects (such as rockets), for measuring altitude, etc., in any of various activities, such as air traffic control or guidance. The electronic equipment or apparatus used to generate, transmit, receive, and usually, to display radio scanning or locating waves, a radar set. Used for radio detection and ranging.

- UF *radio detection and ranging*

- GS **radar**
  - . airborne radar
  - . . . . . airborne surveillance radar
  - . coherent radar
  - . continuous wave radar
  - . Doppler radar
  - . . . . . multistatic radar
  - . . . . . pulse Doppler radar
  - . . . . . monopulse radar
  - . . . . . Shuttle Imaging Radar
  - . ground penetrating radar
  - . imaging radar
  - . . . . . Shuttle Imaging Radar
  - . incoherent scatter radar
  - . . . . . EISCAT radar system (Europe)
  - . infrared radar
  - . landing radar
  - . meteorological radar
  - . moving target indicators
  - . multispectral radar
  - . optical radar
  - . . . . . differential absorption lidar
  - . pulse radar
  - . . . . . pulse Doppler radar
  - . . . . . monopulse radar
  - . . . . . Shuttle Imaging Radar
  - . radar measurement
  - . range and range rate tracking
  - . satellite-borne radar
  - . search radar
  - . . . . . over-the-horizon radar
  - . secondary radar
  - . space based radar
  - . . . . . Shuttle Imaging Radar
  - . surveillance radar
  - . . . . . airborne surveillance radar
  - . . . . . Cobra Dane (radar)
  - . . . . . multistatic radar
  - . synthetic aperture radar
  - . . . . . Shuttle Imaging Radar
  - . . . . . side-looking radar
  - . tracking radar
  - . . . . . Cobra Dane (radar)
  - . . . . . TRADEX radar system
  - . Venus orbiting imaging radar (spacecraft)

- RT aircraft instruments
  - . cancellation circuits
  - . circumlunar communication
  - . collision avoidance

- . display devices
- . distance measuring equipment
- . electromagnetic radiation
- . flight instruments
- . instrument landing systems
- . lunar communication
- . microwave absorption
- . navigation instruments
- . night flights (aircraft)
- . pulse compression
- . radar detection
- . radar scatterometers

## radar absorbers

- GS absorbers (materials)
  - . . . . . **radar absorbers**
  - . . . . . antiradar coatings
- RT countermeasures
  - . electromagnetic absorption
  - . microwave absorption
  - . stealth technology

## radar altimeters

- USE **radio altimeters**

## radar antennas

- GS antennas
  - . directional antennas
  - . . . . . **radar antennas**
  - . . . . . radant
  - . radar equipment
  - . . . . . **radar antennas**
  - . . . . . radant
- RT aircraft antennas
  - . diplexers
  - . dipole antennas
  - . doghouses (electronics)
  - . high resolution coverage antennas
  - . horn antennas
  - . lens antennas
  - . microwave antennas
  - . parabolic antennas
  - . radomes
  - . reflector antennas
  - . Schwarzschild antennas
  - . sidelobe reduction
  - . slot antennas
  - . steerable antennas

## radar approach control

- UF *RAPCON (control)*
- GS approach control
  - . . . . . **radar approach control**
  - . ground based control
  - . . . . . air traffic control
  - . . . . . **radar approach control**
  - . traffic control
  - . . . . . air traffic control
  - . . . . . **radar approach control**
- RT airborne radar approach
  - . aircraft guidance
  - . approach indicators
- ∞ control
  - . instrument landing systems
  - . landing aids
  - . landing instruments
  - . landing radar
  - . radarscopes
  - . surveillance radar

## radar astronomy

DEF The study of celestial bodies within the solar system by means of radiation originating on Earth but reflected from the body under observation.

- GS astronomy
  - . . . . . **radar astronomy**
- RT radio astronomy

## radar attenuation

- GS attenuation
  - . wave attenuation
  - . . . . . **radar attenuation**
- RT atmospheric attenuation
  - . electromagnetic absorption
  - . electromagnetic wave transmission
  - . radio attenuation
  - . sidelobe reduction
  - . signal transmission

transmission  
 wave propagation

**radar beacons**  
 DEF Beacons transmitting characteristic signals on radar frequency, permitting crafts to determine their bearings and sometimes the range of the beacons. Used for racon beacons.  
 UF *racon beacons*  
 GS navigation aids  
 . beacons  
 . . **radar beacons**  
 . . . discrete address beacon system  
 radar equipment  
 . **radar beacons**  
 . . discrete address beacon system

RT aircraft communication  
 compasses  
 position (location)  
 solar compasses  
 transponders

**radar beams**  
 GS beams (radiation)  
 . **radar beams**

RT beamforming  
 pencil beams

**radar clutter maps**  
 GS maps  
 . **radar clutter maps**

**radar corner reflectors**  
 UF *luneberg lenses*  
 GS radar equipment  
 . radar reflectors  
 . . **radar corner reflectors**  
 reflectors  
 . radar reflectors  
 . . **radar corner reflectors**

RT reflector antennas  
 retroreflectors

**radar cross sections**  
 DEF The ratios of power returned in a radar echo to power received by the target reflecting the signal.  
 RT angels (radar)  
 computational electromagnetics  
 ∞ cross sections  
 low observable reentry vehicles  
 moving target indicators  
 stealth technology

**radar data**  
 RT ∞ data  
 microwave photography  
 video data

**radar detection**  
 GS detection  
 . **radar detection**

RT coherent radar  
 continuous wave radar  
 digital radar systems  
 Doppler radar  
 electronic countermeasures  
 electronic warfare  
 multistatic radar  
 optical radar  
 over-the-horizon radar  
 radar  
 radar target scatter site program  
 radarscopes  
 resolution cell  
 satellite-borne radar  
 search radar  
 signal detection  
 space-time adaptive processing  
 stealth technology

*radar direction finders*  
 USE **radio direction finders**

*radar displays*  
 USE **radarscopes**

**radar echoes**  
 UF *radar reflections*  
 GS echoes

. **radar echoes**  
 . . angels (radar)  
 . . clutter  
 . . lunar radar echoes  
 . . solar radar echoes  
 . . Venus radar echoes

RT airborne radar  
 auroral echoes  
 chaff  
 ghosts  
 glint  
 targets

**radar equipment**  
 GS **radar equipment**  
 . doghouses (electronics)  
 . radar antennas  
 . . radant  
 . radar beacons  
 . . discrete address beacon system  
 . radar filters  
 . radar receivers  
 . radar reflectors  
 . . radar corner reflectors  
 . radar transmitters  
 . radarscopes  
 . . plan position indicators  
 . retroreflectors

RT airborne equipment  
 airborne radar  
 airport surface detection equipment  
 automated radar terminal system  
 digital radar systems  
 diplexers  
 distance measuring equipment  
 Doppler radar  
 ∞ equipment  
 jammers  
 look angles (electronics)  
 onboard equipment  
 parabolic antennas  
 radio equipment  
 radomes  
 range finders  
 servomechanisms  
 synthetic aperture radar  
 transponders

**radar filters**  
 GS electromagnetic wave filters  
 . electric filters  
 . . **radar filters**  
 radar equipment  
 . **radar filters**

RT ∞ filters  
 FIR filters  
 microwave filters  
 radant  
 radio filters  
 space-time adaptive processing  
 waveguide filters

**radar geology**  
 DEF The application of imaging radar to geologic problems.  
 GS geology  
 . **radar geology**

RT geological surveys  
 ground penetrating radar  
 Mars Reconnaissance Orbiter  
 Shuttle Imaging Radar

**radar homing missiles**  
 DEF Radar-following missiles designed to attack radar transmitters.  
 GS missiles  
 . **radar homing missiles**

RT military technology  
 missile control  
 missile systems  
 target recognition

**radar imagery**  
 GS imagery  
 . **radar imagery**

RT airborne radar  
 change detection  
 image analysis  
 imaging radar  
 imaging techniques

infrared radar  
 lunar equator  
 Magellan spacecraft (NASA)  
 Priroda module  
 radar maps  
 resolution cell  
 Shuttle Imaging Radar  
 side-looking radar  
 x ray imagery

**radar maps**  
 GS maps  
 . **radar maps**

RT airborne radar  
 digital elevation models  
 map matching guidance  
 meteorological charts  
 radar imagery

**radar measurement**  
 UF *radar sounding*  
 GS radar  
 . **radar measurement**

RT altimetry  
 differential absorption lidar  
 distance measuring equipment  
 ∞ measurement  
 radio altimeters  
 rangefinding  
 satellite altimetry

**radar navigation**  
 GS navigation  
 . **radar navigation**

RT air navigation  
 air traffic control  
 aircraft guidance  
 all-weather air navigation  
 automatic flight control  
 celestial navigation  
 collision avoidance  
 dead reckoning  
 distance  
 distance measuring equipment  
 Doppler navigation  
 Doppler radar  
 Doppler-Fizeau effect  
 ground based control  
 inertial navigation  
 interplanetary navigation  
 map matching guidance  
 radarscopes  
 radio navigation  
 satellite navigation systems  
 space navigation  
 surface navigation  
 Tacan

**radar networks**  
 DEF A series of tracking stations each of which can individually or jointly track a target by utilizing an interchange of radar information. Used for multiradar tracking.  
 UF *multiradar tracking*  
 GS networks  
 . tracking networks  
 . . **radar networks**

RT Doppler radar  
 polystation doppler tracking system  
 tracking stations

*radar observation*  
 USE **radar tracking**

**radar photography**  
 GS imagery  
 . photography  
 . . multispectral photography  
 . . . **radar photography**

RT black and white photography  
 microwave photography  
 radarscopes  
 spectral reconnaissance  
 ultraviolet photography

**radar range**  
 DEF The distance from a radar to a target as measured by the radar. The maximum distance at which a radar set is effective in detecting targets.

## radar receivers

GS distance  
. **radar range**

RT continuous wave radar  
optical slant range  
over-the-horizon radar  
radio range

**radar receivers**

GS radar equipment  
. **radar receivers**  
receivers  
. **radar receivers**

RT airborne radar  
digital radar systems  
electromagnetic noise  
microwave sensors  
radio receivers  
repeaters

**radar reception**

GS signal reception  
. **radar reception**

RT radio reception  
∞ receiving  
sidelobe reduction

*radar reflections*  
USE **radar echoes**

**radar reflectors**

DEF Devices capable of or intended for reflecting radar signals.

GS radar equipment  
. **radar reflectors**  
. . radar corner reflectors  
reflectors  
. **radar reflectors**  
. . radar corner reflectors

RT parabolic antennas  
parabolic reflectors  
radio echoes  
reflector antennas  
sidelobe reduction

**radar resolution**

GS resolution  
. **radar resolution**

RT angular resolution  
display devices  
high resolution coverage antennas  
sidelobe reduction  
spectral resolution

**radar scanning**

DEF The action or process of moving or directing a searching radar beam.

GS scanning  
. **radar scanning**

RT conical scanning  
digital radar systems  
frequency scanning  
meteorological radar  
multiple beam interval scanners  
panoramic scanning  
radio tracking  
side-looking radar  
surveillance

**radar scattering**

GS scattering  
. **radar scattering**

RT EISCAT radar system (Europe)  
incoherent scatter radar  
incoherent scattering  
radar target scatter site program  
scatterometers

**radar signatures**

GS signatures  
. **radar signatures**

RT Cobra Dane (radar)  
detection  
imagery  
microwave signatures  
signature analysis  
stealth technology

target recognition

*radar sounding*  
(added February 2009)  
USE **radar measurement**

**radar target scatter site program**

UF *RATSCAT program*

GS programs  
. **radar target scatter site program**  
targets  
. radar targets  
. . **radar target scatter site program**

RT radar detection  
radar scattering

**radar targets**

DEF Objects which reflect a sufficient amount of a radar signal to produce an echo signal on the radar screen.

GS targets  
. **radar targets**  
. . radar target scatter site program

RT airborne radar  
digital radar systems  
early warning systems  
multiple target tracking  
radial velocity

**radar tracking**

UF *radar observation*

GS tracking (position)  
. **radar tracking**

RT automated radar terminal system  
Ballistic Missile Early Warning System  
compensatory tracking  
digital radar systems  
Doppler radar  
early warning systems  
meteorological radar  
monopulse radar  
moving target indicators  
multiple target tracking  
pursuit tracking  
radio tracking  
range and range rate tracking  
rangefinding  
rawinsondes  
search radar  
slewing  
spacecraft tracking  
surveillance radar  
threat evaluation  
tracking radar  
transponder control group

**radar transmission**

GS transmission  
. electromagnetic wave transmission  
. . **radar transmission**  
. signal transmission  
. . **radar transmission**

RT atmospheric attenuation  
digital radar systems  
EISCAT radar system (Europe)  
electromagnetic pulses  
radio transmission  
radome materials  
wave attenuation  
wave propagation

**radar transmitters**

GS radar equipment  
. **radar transmitters**  
transmitters  
. **radar transmitters**

**Radarsat**

DEF A civilian remote sensing satellite that will be polar orbiting and is jointly being developed by Canada and the United Kingdom with NASA providing the launch. In addition to a synthetic aperture radar, it may carry other instruments such as the Advanced Along Track Scanning Radiometer (AATSR) and the Advanced Radar Altimeter (ARA)/Ocean Wave Spectrometer (OWS). Launch is planned for 1994.

GS Canadian spacecraft  
. **Radarsat**

RT Canadian space program  
synthetic aperture radar

**radarscopes**

DEF The cathode ray oscilloscopes used in radar sets, which display the received signal in such a manner as to indicate things such as range or bearing. Used for radar displays.

UF *radar displays*

GS display devices  
. **radarscopes**  
. . plan position indicators  
radar equipment  
. **radarscopes**  
. . plan position indicators

RT aircraft guidance  
indicating instruments  
microwave imagery  
microwave photography  
radar approach control  
radar detection  
radar navigation  
radar photography  
surveillance radar

**radial distribution**

GS distribution (property)  
. **radial distribution**

RT Rayleigh distribution  
star distribution  
wind profiles

*radial drainage patterns*  
USE **drainage patterns**

**radial flow**

GS fluid flow  
. **radial flow**

RT axial flow  
centrifugal compressors  
diffusion  
flow geometry  
gas flow  
heat transmission  
two dimensional flow

**radial velocity**

DEF In radar, that vector component of the velocity of a moving target that is directed away from or toward the ground station.

GS rates (per time)  
. **radial velocity**  
velocity  
. **radial velocity**

RT astronomical spectroscopy  
blue shift  
Doppler effect  
radar targets  
red shift  
velocity measurement

**radiance**

SN (DIRECTIONAL EMISSION RATE PER UNIT AREA OF RADIATION)

DEF In radiometry, a measure of the intrinsic radiant intensity emitted by a radiator in a given direction. It is the irradiance (radiant flux density) produced by radiation from the source upon a unit surface area oriented normal to the line between source and receiver, divided by the solid angle subtended by the source at the receiving surface. It is assumed that the medium between the radiator and receiver is perfectly transparent; therefore radiance is independent of attenuation between source and receiver.

GS electromagnetic properties  
. optical properties  
. . **radiance**  
rates (per time)  
. flux density  
. . radiant flux density  
. . . **radiance**

RT black body radiation  
brightness  
emissivity  
emittance  
glare  
incandescence  
∞ intensity  
irradiance

lumens  
 luminosity  
 neutron flux density  
 solar flux density  
 transmissometers  
 visibility

**radiancy**

SN (EMISSION RATE PER UNIT AREA OF RADIATION)  
 DEF The rate of radiant energy emission from a unit area of a source in all the radial directions of the overspreading hemisphere.  
 GS rates (per time)  
 . flux density  
 . . radiant flux density  
 . . . **radiancy**  
 RT electron flux density  
 illuminance  
 luminous intensity  
 neutron flux density  
 particle flux density  
 proton flux density  
 solar flux density

**radiant cooling**

GS cooling  
 . **radiant cooling**  
 RT radiative heat transfer  
 surface cooling

*radiant energy*

USE **radiation**

**radiant flux density**

SN (DYNES/CM-SEC AS DISTINGUISHED FROM RADIATION PRESSURE--DYNES/SQ CM)  
 DEF The rate of radiant energy emission from a unit area of a source in all the radial directions of the overspreading hemisphere. Used for power density (electromagnetic), radiant intensity, and radiation intensity.  
 UF *power density (electromagnetic)*  
*radiant intensity*  
*radiation intensity*  
 GS rates (per time)  
 . flux density  
 . . **radiant flux density**  
 . . . irradiance  
 . . . . illuminance  
 . . . . solar constant  
 . . . lumens  
 . . . luminous intensity  
 . . . . illuminance  
 . . . . luminance  
 . . . particle flux density  
 . . . electron flux density  
 . . . neutron flux density  
 . . . proton flux density  
 . . radiance  
 . . radiancy  
 . . solar flux density  
 . . . solar constant  
 RT BL Lacertae objects  
 brightness  
 brightness distribution  
 CERES (experiment)  
 dosimeters  
 emissivity  
 emittance  
 far fields  
 flux (rate)  
 gamma ray bursts  
 laser outputs  
 luminosity  
 maser outputs  
 mass to light ratios  
 post-blast nuclear radiation  
 ∞ radiation  
 radiation counters  
 radiation pressure  
 radio spectra  
 scattering functions  
 solar reflectors  
 sound intensity  
 view effects

**radiant heating**

UF *radiation heating*  
 GS heating

**. radiant heating**

RT ∞ energy  
 gas heating  
 ∞ radiation  
 radiative heat transfer  
 radiative transfer  
 solar heating

*radiant intensity*

USE **radiant flux density**

**∞ radiation**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF The process by which energy is emitted or transferred in the form of photons or electromagnetic waves. Used for radiant energy and radiation emission.  
 UF *radiant energy*  
*radiation emission*  
 RT alpha particles  
 antenna radiation patterns  
 artificial radiation belts  
 atmospheric radiation  
 background noise  
 background radiation  
 base heating  
 beams (radiation)  
 black body radiation  
 Cerenkov radiation  
 circumsolar radiation  
 coherent acoustic radiation  
 coherent electromagnetic radiation  
 coherent radiation  
 continuous radiation  
 corpuscular radiation  
 cosmic rays  
 cyclotron radiation  
 diffuse radiation  
 Earth radiation budget experiment  
 elastic waves  
 electromagnetic noise  
 electromagnetic radiation  
 electron radiation  
 emission  
 extraterrestrial radiation  
 extreme ultraviolet radiation  
 fallout  
 far infrared radiation  
 far ultraviolet radiation  
 flux (rate)  
 flux density  
 galactic radiation  
 gamma rays  
 geophysics  
 gravitational waves  
 harmonic radiation  
 heating  
 incident radiation  
 infrared radiation  
 inner radiation belt  
 interstellar radiation  
 ion cyclotron radiation  
 ionizing radiation  
 irradiation  
 Kirchhoff law of radiation  
 light (visible radiation)  
 long wave radiation  
 longitudinal waves  
 lunar radiation  
 Lyman alpha radiation  
 Lyman beta radiation  
 microwaves  
 modulated continuous radiation  
 monochromatic radiation  
 near infrared radiation  
 near ultraviolet radiation  
 nonthermal radiation  
 nuclear medicine  
 nuclear radiation  
 nucleon potential  
 outer radiation belt  
 photons  
 photosynthetically active radiation  
 plane waves  
 planetary radiation  
 plasma radiation  
 polarized electromagnetic radiation  
 polarized radiation

post-blast nuclear radiation  
 pulsed radiation  
 quantum theory  
 radiant flux density  
 radiant heating  
 radiation absorption  
 radiation belts  
 radiation chemistry  
 radiation counters  
 radiation damage  
 radiation detectors  
 radiation distribution  
 radiation dosage  
 radiation effects  
 radiation hardening  
 radiation hazards  
 radiation injuries  
 radiation laws  
 radiation measurement  
 radiation measuring instruments  
 Radiation Meteoroid spacecraft  
 radiation pressure  
 radiation protection  
 radiation pyrometers  
 radiation shielding  
 radiation sickness  
 radiation sources  
 radiation spectra  
 radiation therapy  
 radiation tolerance  
 radiation transport  
 radiation trapping  
 radiative transfer  
 radioactivity  
 radiology  
 reflected waves  
 relic radiation  
 resonance fluorescence  
 self absorption  
 short wave radiation  
 silicon radiation detectors  
 sky radiation  
 solar corpuscular radiation  
 solar radiation  
 Solar Radiation 1 satellite  
 Solar Radiation 3 satellite  
 solar radiation shielding  
 solar wind  
 sound waves  
 spectral emission  
 standing waves  
 stellar radiation  
 Stokes law of radiation  
 stratosphere radiation  
 synchrotron radiation  
 temperature effects  
 terrestrial radiation  
 thermal radiation  
 TRAP program  
 tropospheric radiation  
 ultrasonic radiation  
 ultraviolet radiation  
 Volterra equations  
 x ray sources

**radiation absorption**

GS energy absorption  
 . **radiation absorption**  
 . . electromagnetic absorption  
 . . . auroral absorption  
 . . . gamma ray absorption  
 . . . infrared absorption  
 . . . microwave absorption  
 . . . multiphoton absorption  
 . . . photoabsorption  
 . . . polar cap absorption  
 . . . ultraviolet absorption  
 . . . x ray absorption  
 . . molecular absorption  
 . . self absorption  
 RT ∞ absorption  
 absorption cross sections  
 atmospheric attenuation  
 gamma ray absorptiometry  
 Goly detector cells  
 gray gas  
 interstellar extinction  
 material absorption  
 neutron absorbers

## Radiation and Meteoroid satellite

- nuclear reactions
- photon absorptiometry
- ∞ radiation
- radiation chemistry
- stopping power

### Radiation and Meteoroid satellite

- GS artificial satellites
- . geophysical satellites
- . . **Radiation and Meteoroid satellite**

### radiation belts

DEF Envelopes of charged particles trapped in the magnetic field of a spatial body. Used for geomagnetically trapped particles and Van Allen radiation belts.

- UF *geomagnetically trapped particles*
- Van Allen radiation belts*

- GS particles
- . charged particles
- . . magnetically trapped particles
- . . . **radiation belts**
- . . . . artificial radiation belts
- . . . . inner radiation belt
- . . . . outer radiation belt
- . . . . proton belts
- . corpuscular radiation
- . . **radiation belts**
- . . . artificial radiation belts
- . . . inner radiation belt
- . . . outer radiation belt
- . . . proton belts
- . trapped particles
- . . magnetically trapped particles
- . . . **radiation belts**
- . . . . artificial radiation belts
- . . . . inner radiation belt
- . . . . outer radiation belt
- . . . . proton belts

- RT aerospace environments

- ∞ belts
- cosmic rays
- Earth atmosphere
- Earth magnetosphere
- electron density (concentration)
- electron precipitation
- electron trajectories
- electrons
- elementary particles
- entrapment
- exosphere
- extraterrestrial radiation
- ionizing radiation
- ionospheric drift
- magnetic fields
- mirror point
- plasmas (physics)
- proton precipitation
- protons
- ∞ radiation
- solar radiation
- trapping
- upper atmosphere

### radiation chemistry

DEF The branch of chemistry concerned with the chemical effects, including decomposition, of energetic radiation or particles of matter.

- GS **radiation chemistry**
- . photodecomposition
- . photodissociation
- . photolysis
- . radiolysis

- RT ∞ chemistry
- electromagnetic radiation
- ∞ radiation
- radiation absorption

### radiation counters

DEF Instruments used for detecting or measuring moving subatomic particles by a counting process. Used for ionization counters, particle counters, and particle detectors.

- UF *ionization counters*
- particle counters*
- particle detectors*

- GS measuring instruments
- . counters
- . . **radiation counters**
- . . . Cerenkov counters

- . . . electron counters
- . . . Geiger counters
- . . . neutron counters
- . . . . neutron spectrometers
- . . . . particle telescopes
- . . . . proportional counters
- . . . . quantum counters
- . . . . scintillation counters
- . . . . spark chambers
- . radiation measuring instruments
- . . **radiation counters**
- . . . Cerenkov counters
- . . . electron counters
- . . . Geiger counters
- . . . neutron counters
- . . . . neutron spectrometers
- . . . . particle telescopes
- . . . . proportional counters
- . . . . quantum counters
- . . . . scintillation counters
- . . . . spark chambers

- RT anticoincidence detectors
- bubble chambers
- channel multipliers
- cloud chambers
- coincidence circuits
- dosimeters
- electrostatic probes
- fluence
- gas discharge tubes
- hodoscopes
- ion traps (instrumentation)
- ionization chambers
- ionizing radiation
- nuclear emulsions
- particle flux density
- proton flux density
- radiant flux density
- ∞ radiation
- scintillating fibers
- spectrometers

### radiation damage

- GS damage
- . **radiation damage**
- . . laser damage
- . radiation effects
- . . **radiation damage**
- . . . laser damage

- RT ionizing radiation
- ∞ radiation
- single event upsets

### radiation detectors

- GS measuring instruments
- . radiation measuring instruments
- . . **radiation detectors**
- . . . dosimeters
- . . . . threshold detectors (dosimeters)
- . . . . Golay detector cells
- . . . . silicon radiation detectors

- RT ∞ detectors
- Geiger counters
- health physics
- multi-anode microchannel arrays
- ∞ radiation
- satellite-borne instruments
- Vela satellites

### radiation distribution

- UF *radiation fields*
- GS distribution (property)
- . **radiation distribution**
- . . antenna radiation patterns
- . . . sidelobes
- . . diffraction patterns
- . . . Kossel pattern
- . . . rainbows
- RT corpuscular radiation
- elastic waves
- electromagnetic radiation
- field theory (physics)
- flux density
- null zones
- ∞ patterns
- ∞ radiation
- vertical distribution

- wave dispersion

### radiation dosage

DEF The amount of radiation absorbed by a material, system, or tissue in a given amount of time; usually measured in units as roentgen. Used for radiation exposure.

- UF *radiation exposure*
- GS dosage
- . **radiation dosage**
- RT biological effects
- dosimeters
- exposure
- health physics
- irradiation
- ∞ radiation
- single event upsets

### radiation effects

- GS **radiation effects**
- . radiation damage
- . . laser damage
- . radiation injuries
- . radiolysis
- . single event upsets
- RT apoptosis
- biological effects
- blackout (propagation)
- Bragg curve
- CRRES (satellite)
- damage
- dosimeters
- ∞ effects
- electron radiation
- fallout
- gamma rays
- health physics
- hematopoiesis
- irradiation
- mechanical properties
- mutagenesis
- neutrons
- nuclear explosion effect
- nuclear radiation
- nuclear vulnerability
- particle tracks
- physiological effects
- post-blast nuclear radiation
- Poynting-Robertson effect
- preserving
- ∞ radiation
- radioactive contaminants
- space based radar
- sterilization effects

### radiation emission

- USE **radiation**

### radiation exposure

- USE **radiation dosage**

### radiation fields

- USE **radiation distribution**

### radiation hardening

- GS hardening (systems)
- . **radiation hardening**
- RT antennas
- electronic equipment
- ∞ radiation

### radiation hazards

- GS hazards
- . **radiation hazards**
- RT dermatitis
- dosimeters
- electromagnetic radiation
- fallout
- flux density
- hazardous materials
- hazardous wastes
- health physics
- ionizing radiation
- laser damage
- mutations
- nuclear explosion effect
- nuclear explosions
- nuclear radiation
- occupational diseases
- operational hazards

- ∞ radiation
  - radioactive contaminants
  - radioactive materials
  - radioactive wastes
  - radioactivity
  - reactor safety
  - space weather
- radiation heating*  
USE **radiant heating**
- radiation injuries**
- GS injuries
    - . **radiation injuries**
    - radiation effects
    - . **radiation injuries**
  - RT burns (injuries)
  - health physics
  - ∞ radiation
- radiation intensity*  
USE **radiant flux density**
- radiation laws**
- GS laws
    - . **radiation laws**
    - . . . Kirchhoff law of radiation
    - . . . Stefan-Boltzmann law
    - . . . Stokes law of radiation
  - RT electromagnetic radiation
  - quantum theory
  - ∞ radiation
- radiation measurement**
- RT dosage
  - dosimeters
  - irradiation
  - ∞ measurement
  - ∞ radiation
  - sensitometry
- radiation measuring instruments**
- UF *photoelectromagnetic detectors*
  - photosensors*
  - radiation meters*
  - GS measuring instruments
    - . **radiation measuring instruments**
    - . . . actinometers
    - . . . . infrared spectrometers
    - . . . . . filter wheel infrared spectrometers
    - . . . . . pyranometers
    - . . . . . radiometers
    - . . . . . Dicke radiometers
    - . . . . . infrared detectors
    - . . . . . . FLIR detectors
    - . . . . . infrared radiometers
    - . . . . . . . Advanced Very High Resolution Radiometer
    - . . . . . . . infrared scanners
    - . . . . . . . visible infrared spin scan radiometer
    - . . . . . . . quantum well infrared photodetectors
    - . . . . . . . microwave radiometers
    - . . . . . . . Advanced Microwave Sounding Unit
    - . . . . . . . . . passive L-band radiometers
    - . . . . . . . . . pressure modulator radiometers
    - . . . . . . . . . spectroradiometers
    - . . . . . . . . . . MISR (radiometry)
    - . . . . . . . . . . MODIS (radiometry)
    - . . . . . . . . . solar spectrometers
    - . . . . . . . . . spectroheliographs
    - . . . . . . . . . spectrophotometers
    - . . . . . . . . . . infrared spectrophotometers
    - . . . . . . . . . . ultraviolet spectrophotometers
    - . . . . . . . . . . ultraviolet detectors
    - . . . . . . . . . . ultraviolet spectrometers
    - . . . . . . . . . . . high dispersion spectrographs
    - . . . . . . . . . . . Total Ozone Mapping Spectrometer
    - . . . . . . . . . . . ultraviolet spectrophotometers
    - . . . . . . . . . x ray detectors
    - . . . bolometers
    - . . Ebert spectrometers
    - . . electrostatic probes
    - . . Fabry-Perot spectrometers
    - . . hodoscopes
    - . . infrared instruments
- . . . infrared detectors
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . . Advanced Very High Resolution Radiometer
- . . . . . . . infrared scanners
- . . . . . . . visible infrared spin scan radiometer
- . . . . . . . quantum well infrared photodetectors
- . . . . . . . infrared interferometers
- . . . . . . . infrared spectrometers
- . . . . . . . filter wheel infrared spectrometers
- . . . . . . . infrared spectrophotometers
- . . . . . . . photometers
- . . . . . . . electrophotometers
- . . . . . . . ultraviolet spectrometers
- . . . . . . . high dispersion spectrographs
- . . . . . . . Total Ozone Mapping Spectrometer
- . . . . . . . quantum well infrared photodetectors
- . . . . . . . ultraviolet spectrophotometers
- . . . . . . . radiation counters
- . . . . . . . Cerenkov counters
- . . . . . . . electron counters
- . . . . . . . Geiger counters
- . . . . . . . neutron counters
- . . . . . . . . neutron spectrometers
- . . . . . . . . particle telescopes
- . . . . . . . . proportional counters
- . . . . . . . . quantum counters
- . . . . . . . . scintillation counters
- . . . . . . . . spark chambers
- . . . . . . . radiation detectors
- . . . . . . . dosimeters
- . . . . . . . . threshold detectors (dosimeters)
- . . . . . . . . Golay detector cells
- . . . . . . . . silicon radiation detectors
- . . . . . . . riometers
- RT ∞ detectors
- Earth radiation budget experiment
- health physics
- ionization chambers
- monitors
- nuclear emulsions
- optical measuring instruments
- ∞ radiation
- safety devices
- solar instruments
- Vela satellites
- view effects
- radiation medicine*  
USE **nuclear medicine**
- Radiation Meteoroid spacecraft**
- RT meteoroids
  - ∞ radiation
  - ∞ spacecraft
  - spacecraft configurations
- radiation meters*  
USE **radiation measuring instruments**
- radiation noise*  
USE **electromagnetic noise**
- radiation pressure**
- SN (DYNES/SQ CM AS DISTINGUISHED FROM RADIANT FLUX DENSITY--DYNES/CM-SEC)
  - DEF Pressure exerted upon any material body by electromagnetic radiation incident upon it.
  - GS pressure
    - . **radiation pressure**
    - . . electron pressure
    - . . lumens
    - . . luminous intensity
    - . . illuminance
    - . . luminance
    - . . sound pressure
  - RT baroclinic waves
  - Bessel-Bredichin theory
  - comet tails
  - corpuscular radiation
  - elastic waves
  - electromagnetic radiation
- Kohoutek comet
- particle flux density
- perturbation
- photophoresis
- radiant flux density
- ∞ radiation
- solar flux density
- solar radiation
- solar wind
- stellar winds
- radiation protection**
- GS protection
    - . **radiation protection**
    - . . radiation shielding
    - . . . solar radiation shielding
  - RT antiradiation drugs
  - cysteamine
  - health physics
  - ∞ radiation
  - synchrotron radiation
  - thermal protection
  - visors
- radiation pyrometers**
- GS measuring instruments
  - temperature measuring instruments
  - . . pyrometers
  - . . . **radiation pyrometers**
  - RT bolometers
  - circumsolar telescopes
  - optical pyrometers
  - ∞ radiation
  - temperature measurement
  - thermocouple pyrometers
- radiation resistance*  
USE **radiation tolerance**
- radiation shielding**
- UF *nuclear shielding*
  - GS protection
    - . radiation protection
    - . . **radiation shielding**
    - . . . solar radiation shielding
  - shielding
  - . **radiation shielding**
  - . . solar radiation shielding
  - RT absorbers (materials)
  - attenuators
  - Boral
  - electromagnetic absorption
  - electromagnetic shielding
  - gamma rays
  - ∞ insulated structures
  - magnetic shielding
  - neutron absorbers
  - neutron flux density
  - neutrons
  - nuclear reactors
  - protons
  - ∞ radiation
  - radio frequency shielding
  - reactor materials
  - reflectors
  - safety devices
  - space based radar
  - spacecraft shielding
  - stopping power
  - Tower Shielding Reactor 2
- radiation sickness**
- DEF A syndrome following intense acute exposure to ionizing radiation. It is characterized by nausea and vomiting a few hours after exposure. Further symptoms include bloody diarrhea, hemorrhage under the skin (and internally), epilation (hair falling out), and a decrease in blood cell level.
- GS diseases
  - . **radiation sickness**
- RT antiradiation drugs
- dermatitis
- health physics
- ∞ radiation
- radiopathology
- radiation sources**
- UF *coherent sources*
- GS **radiation sources**



## radiation spectra

- . monochromators
  - . neutron sources
  - . point sources
  - RT corpuscular radiation
  - duochromators
  - electromagnetic radiation
  - electron sources
  - extragalactic radio sources
  - ∞ generators
  - heat sources
  - interstellar masers
  - ion sources
  - light sources
  - pulsars
  - ∞ radiation
  - radio sources (astronomy)
  - radioactive materials
  - sound generators
  - ∞ sources
  - spectral counterparts (astronomy)
  - x ray stars
- radiation spectra**
- GS spectra
    - . **radiation spectra**
    - . . . absorption spectra
    - . . . Fraunhofer lines
    - . . . Herzberg bands
    - . . . telluric lines
    - . . . electromagnetic spectra
    - . . . gamma ray spectra
    - . . . infrared spectra
    - . . . line spectra
      - . . . . Balmer series
      - . . . . D lines
      - . . . . electronic spectra
      - . . . . Fraunhofer lines
      - . . . . H lines
        - . . . . . H alpha line
        - . . . . . H beta line
        - . . . . . H gamma line
      - . . . . K lines
      - . . . . Lyman spectra
      - . . . . Paschen series
      - . . . . Rydberg series
      - . . . . telluric lines
    - . . . radio spectra
      - . . . . microwave spectra
      - . . . Raman spectra
      - . . . stellar spectra
      - . . . . solar spectra
      - . . . UVB spectra
      - . . . ultraviolet spectra
      - . . . vibrational spectra
      - . . . visible spectrum
      - . . . x ray spectra
      - . . emission spectra
  - RT astronomical spectroscopy
  - Cosmic Background Explorer satellite
  - energy spectra
  - mass spectra
  - noise spectra
  - plasma spectra
  - ∞ radiation
- radiation therapy**
- UF *radiotherapy*
  - GS therapy
    - . **radiation therapy**
  - RT cancer
  - medical science
  - pathology
  - ∞ radiation
- radiation tolerance**
- UF *radiation resistance*
  - radiosensitivity*
  - GS sensitivity
    - . **radiation tolerance**
    - tolerances (physiology)
    - . **radiation tolerance**
  - RT human tolerances
  - irradiation
  - ∞ radiation
  - ∞ resistance
  - tolerances (mechanics)
- radiation transport**
- DEF The study of radiation from emission to absorption.

- RT exploding wires
  - ∞ radiation
  - radiative transfer
  - transport properties
- radiation trapping**
- DEF Confinement of radiation with a magnetic field.
  - RT argon
  - Earth magnetosphere
  - excitation
  - metastable state
  - plasma physics
  - ∞ radiation
- radiative forcing**
- (added August 2009)
  - DEF Stratospherically adjusted radiative flux change at the Earth's troposphere as influenced by a natural or anthropomorphic climate factor.
  - GS environment effects
    - . **radiative forcing**
  - RT aerosols
  - air pollution
  - atmospheric heating
  - atmospheric radiation
  - atmospheric temperature
  - climate change
  - climatology
  - Earth albedo
  - Earth radiation budget
  - global warming
  - greenhouse effect
- radiative heat transfer**
- GS radiative transfer
    - . **radiative heat transfer**
    - transmission
    - . heat transmission
    - . . heat transfer
    - . . . **radiative heat transfer**
  - RT concentrators
  - convective heat transfer
  - cooling fins
  - heat radiators
  - infrared reflection
  - near infrared radiation
  - radiant cooling
  - radiant heating
  - satellite temperature
  - spacecraft radiators
  - Stefan-Boltzmann law
  - surface cooling
  - thermohydraulics
  - Trombe walls
  - view effects
- radiative lifetime**
- RT decay
  - half life
- radiative recombination**
- GS recombination reactions
    - . electron recombination
    - . . **radiative recombination**
    - . electron-ion recombination
    - . . **radiative recombination**
  - RT airglow
  - atomic recombination
  - carrier injection
  - deionization
  - lightning
- radiative transfer**
- GS **radiative transfer**
  - . radiative heat transfer
  - RT atmospheric correction
  - cosmic rays
  - electromagnetic radiation
  - energy transfer
  - extraterrestrial radiation
  - galactic radiation
  - heat transfer
  - heat transmission
  - interstellar radiation
  - near infrared radiation
  - planetary atmospheres
  - polarized electromagnetic radiation
  - radiant heating

- ∞ radiation
  - radiation transport
  - radio bursts
  - radio stars
  - solar radiation
  - stellar atmospheres
  - stellar radiation
  - Surface Meteorology and Solar Energy project
  - Surface Radiation Budget project
- ∞ **radiators**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF Any sources of radiant energy, especially electromagnetic radiation. Devices that dissipate the heat from something as from water or oil, not necessarily by radiation only.
  - RT antennas
  - heat radiators
  - sound transducers
  - thermosiphons
- radicals**
- GS **radicals**
  - . amino radical
  - . formyl ions
  - . free radicals
  - . . hydroxyl radicals
  - . methylidyne
  - . vanadyl radical
  - . vinyl radical
  - RT ∞ roots
- radii**
- UF *radius*
  - GS dimensions
  - . **radii**
  - . . Larmor radius
  - geometry
  - . Euclidean geometry
  - . . **radii**
  - . . . Larmor radius
  - RT circles (geometry)
  - circumferences
  - diameters
  - lines (geometry)
  - radio frequencies
  - segments
- radio altimeters**
- DEF Devices that measure the altitude of a craft above the terrain by measuring the elapsed time between transmission of radio waves from the craft and the reception of the same waves reflected from the terrain. Used for radar altimeters.
  - UF *radar altimeters*
  - GS flight instruments
  - . **radio altimeters**
  - measuring instruments
  - . distance measuring equipment
  - . . altimeters
  - . . . **radio altimeters**
  - RT aircraft instruments
  - automatic pilots
  - instrument landing systems
  - radar measurement
- radio antennas**
- GS antennas
  - . **radio antennas**
  - . . microwave antennas
  - . . . horn antennas
  - . . . lens antennas
  - . . . rectennas
  - . . . spacetennas
  - radio equipment
  - . **radio antennas**
  - . . microwave antennas
  - . . . horn antennas
  - . . . lens antennas
  - . . . rectennas
  - . . . spacetennas
  - RT aircraft antennas
  - backfire antennas
  - directional antennas
  - omnidirectional antennas
  - reception diversity

reflector antennas  
rhombic antennas  
satellite antennas  
Schwarzschild antennas  
two reflector antennas  
whip antennas

**radio astronomy**

DEF The study of celestial objects through observation of radiofrequency waves emitted or reflected by these objects. Specifically, the study of celestial objects by measurement of the radiation emitted by them in the radiofrequency range of the electromagnetic spectrum.

GS astronomy

. **radio astronomy**

RT astronomical interferometry  
astronomical observatories  
astronomical spectroscopy  
brightness distribution  
brightness temperature  
coronal holes  
cosmic microwave background  
radiation  
extragalactic radio sources  
extraterrestrial radio waves  
gamma ray astronomy  
IUE  
linear polarization  
Maffei galaxies  
Michelson interferometers  
phase switching interferometers  
pulsars  
quasars  
Quasat  
radar astronomy  
radio jets (astronomy)  
SAS-1  
SAS-2  
SAS-3  
∞ science  
Sunyaev-Zeldovich effect  
very high frequency radio equipment  
Very Large Array (VLA)  
very long base interferometry  
Very Long Baseline Array (VLBA)

*Radio Astronomy Explorer 2*

USE **Explorer 49 satellite**

*Radio Astronomy Explorer B*

USE **Explorer 49 satellite**

**Radio Astronomy Explorer satellite**

GS artificial satellites  
. scientific satellites  
. Explorer satellites  
. . . **Radio Astronomy Explorer satellite**

**radio attenuation**

UF *radio signal attenuation*

GS attenuation

. wave attenuation

. . **radio attenuation**

RT atmospheric attenuation  
electromagnetic absorption  
electromagnetic wave transmission  
ground effect (communications)  
radar attenuation  
signal transmission  
transhorizon radio propagation  
transmission  
wave propagation

**Radio Attenuation Measurement project**

UF *RAM project*

GS programs

. projects

. . **Radio Attenuation Measurement project**

**radio auroras**

GS atmospheric radiation

. auroras

. . **radio auroras**

RT ∞ disturbances

ionospherics

nightglow

solar activity

**radio beacons**

DEF Transmitters together with their associated equipment, that emit signals enabling the determination, by means of suitable receiving equipment, of direction, distance, or position with respect to the beacon. Used for radio ranges.

UF *radio ranges*

GS navigation aids

. beacons

. . **radio beacons**

. . . omnidirectional radio ranges

. . . . self calibrating omnirange

radio equipment

. radio transmitters

. . **radio beacons**

. . . omnidirectional radio ranges

. . . . self calibrating omnirange

transmitters

. radio transmitters

. . **radio beacons**

. . . omnidirectional radio ranges

. . . . self calibrating omnirange

RT

airport beacons

Beacon Collision Avoidance System

homing devices

instrument landing systems

landing aids

∞ markers

night flights (aircraft)

ORBIS

ORBIS CAL satellite

ranges (facilities)

solar compasses

*radio broadcasting*

USE **broadcasting**

**radio bursts**

GS bursts

. **radio bursts**

. . solar radio bursts

. . . type 2 bursts

. . . type 3 bursts

. . . type 4 bursts

. . . type 5 bursts

electromagnetic radiation

. radio waves

. . extraterrestrial radio waves

. . . **radio bursts**

. . . . solar radio bursts

. . . . . type 2 bursts

. . . . . type 3 bursts

. . . . . type 4 bursts

. . . . . type 5 bursts

. . radio emission

. . . **radio bursts**

. . . . solar radio bursts

. . . . . type 2 bursts

. . . . . type 3 bursts

. . . . . type 4 bursts

. . . . . type 5 bursts

emission

. radio emission

. . **radio bursts**

. . . solar radio bursts

. . . . type 2 bursts

. . . . . type 3 bursts

. . . . . type 4 bursts

. . . . . type 5 bursts

extraterrestrial radiation

. extraterrestrial radio waves

. . **radio bursts**

. . . solar radio bursts

. . . . type 2 bursts

. . . . . type 3 bursts

. . . . . type 4 bursts

. . . . . type 5 bursts

RT ∞ disturbances

pulsars

quasars

radiative transfer

solar radio emission

stellar radiation

**radio communication**

GS telecommunication

. **radio communication**

. . radio relay systems

. . . code division multiple access

. . . time division multiple access

. . radio telegraphy

. . radio telemetry

. . . pulse frequency modulation

telemetry

. . telephony

RT

access control

aircraft communication

blackout (propagation)

broadcasting

circumlunar communication

code division multiplexing

communication equipment

communication networks

Fleet Satellite Communication System

frequency division multiple access

frequency division multiplexing

ground-air-ground communication

interplanetary communication

interstellar communication

land mobile satellite service

lunar communication

Marisat 1 satellite

Marisat satellites

mobile communication systems

MSAT

NASCOM network

point to point communication

Project SETI

pulse communication

radiotelephones

reentry communication

satellite communication

ship to shore communication

space communication

spacecraft communication

telegraph systems

telemetry

television systems

transoceanic communication

underground communication

vocoders

voice communication

**radio control**

DEF Remote control of a pilotless airplane, rocket, or spacecraft by means of radio signals that activate controlling devices.

GS remote control

. **radio control**

RT

aircraft control

automatic control

∞ control

Deep Space Instrumentation Facility

ground based control

missile control

spacecraft control

*radio detection and ranging*

USE **radar**

**radio direction finders**

DEF Radio receiving sets, together with associated equipment, used to determine the direction from which a radio signal is transmitted. Used for direction finders (radio) and radar direction finders.

UF *direction finders (radio)*

*radar direction finders*

GS

display devices

. position indicators

. . **radio direction finders**

measuring instruments

. indicating instruments

. . position indicators

. . . **radio direction finders**

navigation aids

. beacons

. . **radio direction finders**

. navigation instruments

. . **radio direction finders**

RT

aircraft equipment

compasses

direction finding

flight instruments

gyrocompasses

homing

homing devices

## radio echoes

radiogoniometers  
VHF omnirange navigation

### radio echoes

UF *radio reflection*  
GS echoes  
  . **radio echoes**  
RT angels (radar)  
  auroral echoes  
  ghosts  
  Harvard Radio Meteor Project  
  infrared reflection  
  lunar echoes  
  radar reflectors  
  ultraviolet reflection

### radio electronics

RT ∞ electronics

### radio emission

GS electromagnetic radiation  
  . radio waves  
  . . **radio emission**  
  . . . CN emission  
  . . . hydroxyl emission  
  . . . radio bursts  
  . . . . solar radio bursts  
  . . . . . type 2 bursts  
  . . . . . type 3 bursts  
  . . . . . type 4 bursts  
  . . . . . type 5 bursts  
  . . . solar radio emission  
  . . . . solar radio bursts  
  . . . . . type 2 bursts  
  . . . . . type 3 bursts  
  . . . . . type 4 bursts  
  . . . . . type 5 bursts  
  emission  
  . **radio emission**  
  . . CN emission  
  . . hydroxyl emission  
  . . radio bursts  
  . . . solar radio bursts  
  . . . . type 2 bursts  
  . . . . type 3 bursts  
  . . . . type 4 bursts  
  . . . . type 5 bursts  
  . . . solar radio emission  
  . . . . solar radio bursts  
  . . . . . type 2 bursts  
  . . . . . type 3 bursts  
  . . . . . type 4 bursts  
  . . . . . type 5 bursts  
RT extragalactic radio sources  
  extraterrestrial radio waves  
  quasars  
  radio jets (astronomy)

### radio equipment

GS **radio equipment**  
  . radio antennas  
  . . microwave antennas  
  . . . horn antennas  
  . . . lens antennas  
  . . . rectennas  
  . . . spacetennas  
  . radio filters  
  . radio receivers  
  . . superheterodyne receivers  
  . . transmitter receivers  
  . . whistler recorders  
  . radio telescopes  
  . . kilometer wave orbiting telescope  
  . . Very Large Array (VLA)  
  . . Very Long Baseline Array (VLBA)  
  . radio transmitters  
  . . radio beacons  
  . . . omnidirectional radio ranges  
  . . . . self calibrating omnirange  
  . . radiometeorographs  
  . . radiosondes  
  . . . ionosondes  
  . . . rawinsondes  
  . . radiotelephones  
  . . sonobuoys  
  . . transmitter receivers  
  . . reception diversity  
  . spacecraft antennas  
  . transponders  
  . very high frequency radio equipment

RT airborne equipment  
  antennas  
  broadcasting  
  communication equipment  
  crystal filters  
  cylindrical antennas  
  jammers  
  near fields  
  onboard equipment  
  radar equipment

### radio filters

GS electromagnetic wave filters  
  . electric filters  
  . . **radio filters**  
  radio equipment  
  . **radio filters**  
RT crystal filters  
∞ filters  
  interference grating  
  microwave filters  
  radar filters  
  tunable filters

### radio frequencies

DEF Frequencies at which coherent electromagnetic radiation of energy is useful for communications purposes.

GS frequencies  
  . **radio frequencies**  
  . . extremely low frequencies  
  . . high frequencies  
  . . intermediate frequencies  
  . . low frequencies  
  . . . very low frequencies  
  . . microwave frequencies  
  . . . C band  
  . . . extremely high frequencies  
  . . . P band  
  . . . superhigh frequencies  
  . . ultrahigh frequencies  
  . . . P band  
  . . very high frequencies  
  . . . P band

RT audio frequencies  
  carrier frequencies  
  radii

### radio frequency discharge

GS electric current  
  . electric discharges  
  . . **radio frequency discharge**  
RT electrodeless discharges  
  electron emission  
  ring discharge

### radio frequency heating

GS heating  
  . **radio frequency heating**  
RT induction heating  
  plasma heating  
  VASIMR (propulsion system)

### radio frequency impedance probes

GS measuring instruments  
  . impedance probes  
  . . **radio frequency impedance probes**  
RT impedance measurement  
  ion probes  
  microwave probes  
  plasma probes

### radio frequency interference

DEF Degradation of the reception of a wanted signal caused by radio frequency disturbance.

UF *radio interference*  
GS electromagnetic interference  
  . **radio frequency interference**  
  . . blackout (propagation)  
  . . . polar radio blackout  
  . . . chirp  
  . . . chirp signals  
  . . electromagnetic noise  
  . . . atmospheric  
  . . . . ionospheric  
  . . . . . dawn chorus  
  . . . . . hiss

  . . . . sudden enhancement of  
  . . . . . atmospheric  
  . . . . whistlers  
  . . . cosmic noise  
  . . . ionospheric noise  
  . . . . whistlers  
  . . . shot noise  
  . . . white noise  
  . . . . thermal noise  
  . . cochannel interference  
  . . ionospheric cross modulation  
RT clutter  
  cross coupling  
  electromagnetic compatibility  
  electronic countermeasures  
  electronic warfare  
  extraterrestrial radio waves  
∞ interference  
  interference grating  
  interference immunity  
  jamming  
  noise generators  
  noise storms  
  signal fading

*radio frequency ion thruster engines*

USE **RIT engines**

*radio frequency noise*

USE **electromagnetic noise**

*radio frequency radiation*

USE **radio waves**

### radio frequency shielding

GS shielding  
  . electromagnetic shielding  
  . . **radio frequency shielding**  
RT radiation shielding  
  spacecraft shielding

### radio galaxies

GS celestial bodies  
  . galaxies  
  . . active galaxies  
  . . . **radio galaxies**  
  . . radio sources (astronomy)  
  . . extragalactic radio sources  
  . . . **radio galaxies**  
RT active galactic nuclei  
  blazars  
  disk galaxies  
  Maffei galaxies  
  quasars

### radio horizons

DEF Loci or points at which direct rays from a radio transmitter become tangential to the Earth's surface.

GS horizon  
  . **radio horizons**  
RT horizon scanners

*radio interference*

USE **radio frequency interference**

### radio interferometers

DEF Interferometers operating at radio frequencies. Radio interferometers are used in radio astronomy and in satellite tracking.

GS measuring instruments  
  . interferometers  
  . . **radio interferometers**  
RT astrophysics  
  Orion (radio interferometry network)  
  very long base interferometry

### radio jets (astronomy)

DEF Jets of energetic particles occurring in radio galaxies and quasars usually emitted from the nuclear (active) region of the extragalactic radio source.

GS celestial bodies  
  . radio sources (astronomy)  
  . . extragalactic radio sources  
  . . . **radio jets (astronomy)**  
  particles  
  . charged particles  
  . . plasma jets  
  . . . **radio jets (astronomy)**

- RT astrophysics  
energetic particles  
extraterrestrial radiation  
extraterrestrial radio waves  
galactic nuclei  
galactic radio waves  
quasars  
radio astronomy  
radio emission
- radio meteorology**  
GS meteorology  
. **radio meteorology**  
RT atmospheric  
meteorological radar  
radiosondes
- radio meteors**  
DEF Meteors which have been detected by the reflection of radio signals from the meteor trails of relatively high ion density (ion columns).  
GS celestial bodies  
. meteoroids  
. . **radio meteors**  
RT atmospheric ionization  
meteor trails
- radio navigation**  
DEF Navigation based upon the reception of radio signals.  
GS navigation  
. **radio navigation**  
. . hyperbolic navigation  
. . . Decca navigation  
. . . LORAC navigation system  
. . . loran  
. . . . loran C  
. . . . loran D  
. . . Shoran  
. . Tacan  
. . VHF omnirange navigation  
RT air navigation  
air traffic control  
aircraft guidance  
all-weather air navigation  
astronavigation  
automatic flight control  
celestial navigation  
collision avoidance  
dead reckoning  
distance measuring equipment  
Doppler navigation  
flight control  
guidance (motion)  
homing devices  
inertial navigation  
interplanetary navigation  
navigation aids  
omnidirectional radio ranges  
positioning  
radar navigation  
satellite navigation systems  
solar compasses  
space navigation  
surface navigation
- radio observation**  
GS observation  
. **radio observation**  
RT space observations (from Earth)
- radio occultation**  
GS occultation  
. **radio occultation**  
RT atmospheric composition  
atmospheric pressure  
atmospheric temperature  
planetary atmospheres  
space probes  
spacecraft trajectories
- radio physics**  
RT  $\infty$  physics  
 $\infty$  science  
theoretical physics
- radio probing**  
RT measuring instruments
- $\infty$  probes
- radio propagation*  
USE **radio transmission**
- radio range**  
SN (EXCLUDES RADIO BEACONS)  
GS distance  
. **radio range**  
range (extremes)  
. frequency ranges  
. . **radio range**  
RT radar range
- radio ranges*  
USE **radio beacons**
- radio receivers**  
GS communication equipment  
. **radio receivers**  
. . superheterodyne receivers  
. . transmitter receivers  
. . whistler recorders  
radio equipment  
. **radio receivers**  
. . superheterodyne receivers  
. . transmitter receivers  
. . whistler recorders  
receivers  
. **radio receivers**  
. . superheterodyne receivers  
. . transmitter receivers  
. . whistler recorders  
RT data links  
directors (antenna elements)  
electromagnetic noise  
intermediate frequency amplifiers  
loudspeakers  
Orion (radio interferometry network)  
parasitic elements (antennas)  
radar receivers  
reception diversity  
television reception  
transponders  
tuners
- radio reception**  
GS signal reception  
. **radio reception**  
RT homodyne reception  
radar reception  
 $\infty$  receiving  
reception diversity  
scatter propagation  
television reception
- radio reflection*  
USE **radio echoes**
- radio relay systems**  
GS telecommunication  
. radio communication  
. . **radio relay systems**  
. . . code division multiple access  
. . . time division multiple access  
RT communication equipment  
communication satellites  
data links  
Defense Communications Satellite System  
Earth terminal measurement system  
Earth terminals  
Global Tracking Network  
Molniya satellites  
MSAT  
orbit spectrum utilization  
 $\infty$  relay  
 $\infty$  systems  
TDR satellites
- radio scattering**  
GS scattering  
. **radio scattering**  
. . microwave scattering  
RT atmospheric diffusion  
atmospheric scattering  
scatter propagation  
signal fading
- signal transmission
- radio signal attenuation*  
USE **radio attenuation**
- radio signal propagation*  
USE **radio transmission**
- radio signals**  
RT broadcasting  
Project SETI  
Rayleigh fading  
signal distortion  
signal mixing  
 $\infty$  signals  
transhorizon radio propagation  
whistlers
- radio sources (astronomy)**  
SN (LIMITED TO EXTRATERRESTRIAL RADIO SOURCES)  
DEF Celestial objects that emit radio waves.  
GS celestial bodies  
. **radio sources (astronomy)**  
. . Cassiopeia A  
. . extragalactic radio sources  
. . . radio galaxies  
. . . radio jets (astronomy)  
. . . quasars  
. . radio stars  
. . . pulsars  
RT BL Lacertae objects  
blazars  
CN emission  
extraterrestrial radio waves  
galactic nuclei  
galaxies  
gamma ray sources (astronomy)  
hydroxyl emission  
irregular galaxies  
Maffei galaxies  
Milky Way Galaxy  
radiation sources  
 $\infty$  sources  
spectral counterparts (astronomy)
- radio spectra**  
DEF Frequencies of electromagnetic radiation usable for radio communication.  
GS spectra  
. radiation spectra  
. . electromagnetic spectra  
. . . **radio spectra**  
. . . . microwave spectra  
RT carrier waves  
electromagnetic noise  
H I regions  
radiant flux density
- radio spectroscopy**  
GS spectroscopy  
. **radio spectroscopy**  
RT astronomical spectroscopy  
ultraviolet spectra  
ultraviolet spectroscopy  
x ray spectroscopy
- radio stars**  
GS celestial bodies  
. radio sources (astronomy)  
. . **radio stars**  
. . . pulsars  
. . stars  
. . **radio stars**  
. . . pulsars  
RT quasars  
radiative transfer  
stellar radiation
- radio telegraphy**  
GS telecommunication  
. radio communication  
. . **radio telegraphy**  
RT communication equipment  
keying  
Morse code
- radio telemetry**  
GS telecommunication  
. radio communication  
. . **radio telemetry**

## radio telescopes

- . . . pulse frequency modulation telemetry
- . telemetry
- . . **radio telemetry**
- . . . pulse frequency modulation telemetry
- transmission
- . signal transmission
- . . telemetry
- . . . **radio telemetry**
- . . . . pulse frequency modulation telemetry
- RT communication equipment
- data transmission
- extraterrestrial communication
- ground support equipment
- measuring instruments
- pulse modulation
- radiometeorographs
- radiosondes
- space communication
- wireless communication

### radio telescopes

DEF Devices for receiving, amplifying, and measuring the intensity of radio waves originating outside the Earth's atmosphere or reflected from a body outside the atmosphere.

- GS radio equipment
- . **radio telescopes**
- . . kilometer wave orbiting telescope
- . . Very Large Array (VLA)
- . . Very Long Baseline Array (VLBA) telescopes
- . **radio telescopes**
- . . kilometer wave orbiting telescope
- . . Very Large Array (VLA)
- . . Very Long Baseline Array (VLBA)
- RT antennas
- Jodrell Bank Observatory
- optical equipment
- phase switching interferometers
- Quasat

### radio tracking

- GS tracking (position)
- . **radio tracking**
- . . wildlife radiolocation
- RT radar scanning
- radar tracking
- range and range rate tracking
- rangefinding
- rawinsondes
- spacecraft tracking

### radio transmission

DEF The transmission of signals by means of radiated electromagnetic waves other than light or heat waves. Used for radio propagation and radio signal propagation.

- UF *radio propagation*
- radio signal propagation*
- GS transmission
- . electromagnetic wave transmission
- . . **radio transmission**
- . . . double sideband transmission
- . . . ionospheric propagation
- . . . . ionospheric F-scatter propagation
- . . . microwave transmission
- . . . multipath transmission
- . . . short wave radio transmission
- . . . single sideband transmission
- . . . spread spectrum transmission
- . . . transequatorial propagation
- . . . transhorizon radio propagation
- . signal transmission
- . . **radio transmission**
- . . . double sideband transmission
- . . . ionospheric propagation
- . . . . ionospheric F-scatter propagation
- . . . microwave transmission
- . . . multipath transmission
- . . . short wave radio transmission
- . . . single sideband transmission
- . . . spread spectrum transmission
- . . . transequatorial propagation
- . . . transhorizon radio propagation
- RT antipodes

- atmospheric attenuation
- broadcasting
- code division multiplexing
- companding
- data transmission
- Earth-ionosphere waveguide
- F region
- frequency reuse
- frequency shift keying
- magnetoionics
- modulation
- multiplexing
- packet switching
- pulse communication
- pulse frequency modulation telemetry
- radar transmission
- radome materials
- satellite transmission
- scatter propagation
- Seafarer project
- Sommerfeld approximation
- Symphonie satellites
- Voice of America
- wave attenuation
- wave propagation

### radio transmitters

DEF Devices for producing radio-frequency power, for purposes of radio transmission.

- GS radio equipment
- . **radio transmitters**
- . . radio beacons
- . . . omnidirectional radio ranges
- . . . . self calibrating omnirange
- . . radiometeorographs
- . . radiosondes
- . . . ionosondes
- . . . rawinsondes
- . . radiotelephones
- . . sonobuoys
- . . transmitter receivers
- transmitters
- . **radio transmitters**
- . . radio beacons
- . . . omnidirectional radio ranges
- . . . . self calibrating omnirange
- . . radiometeorographs
- . . radiosondes
- . . . ionosondes
- . . . rawinsondes
- . . radiotelephones
- . . sonobuoys
- . . transmitter receivers
- RT multichannel communication
- quartz crystals
- television transmission
- transponders
- wildlife radiolocation

### radio wave refraction

- GS refraction
- . atmospheric refraction
- . . **radio wave refraction**
- RT wave dispersion

### radio waves

DEF Waves produced by oscillation of an electric charge at a frequency useful for radio communication. Used for radio frequency radiation.

- UF *radio frequency radiation*
- GS electromagnetic radiation
- . **radio waves**
- . . decametric waves
- . . extraterrestrial radio waves
- . . . galactic radio waves
- . . . . North Polar Spur (astronomy)
- . . . radio bursts
- . . . . solar radio bursts
- . . . . . type 2 bursts
- . . . . . type 3 bursts
- . . . . . type 4 bursts
- . . . . . type 5 bursts
- . . . solar radio emission
- . . . . solar radio bursts
- . . . . . type 2 bursts
- . . . . . type 3 bursts
- . . . . . type 4 bursts
- . . . . . type 5 bursts

- . . . cosmic microwave background radiation
- . . long wave radiation
- . . radio emission
- . . . CN emission
- . . . hydroxyl emission
- . . . radio bursts
- . . . . solar radio bursts
- . . . . . type 2 bursts
- . . . . . type 3 bursts
- . . . . . type 4 bursts
- . . . . . type 5 bursts
- . . . solar radio emission
- . . . . solar radio bursts
- . . . . . type 2 bursts
- . . . . . type 3 bursts
- . . . . . type 4 bursts
- . . . . . type 5 bursts
- . . short wave radiation
- . . . microwaves
- . . . centimeter waves
- . . . cosmic microwave background radiation
- . . . . decimeter waves
- . . . . microwave emission
- . . . . millimeter waves
- . . . submillimeter waves
- . . sky waves
- . . whistlers
- RT atmospheric
- coherent electromagnetic radiation
- electromagnetic noise
- electromagnetic surface waves
- extraterrestrial radiation
- far infrared radiation
- frequencies
- ground wave propagation
- monochromatic radiation
- multipath transmission
- nonthermal radiation
- planetary radiation
- polarized electromagnetic radiation
- scatter propagation
- solar radiation
- solitary waves
- thermal radiation
- transverse waves
- traveling waves
- tropospheric waves

### radioactive age determination

- UF *radioactive dating*
- RT  $\infty$  aging
- fossils
- geochronology
- half life
- $\infty$  measurement
- radiochemistry
- radiogenic materials
- time measurement

### radioactive contaminants

- GS contaminants
- . **radioactive contaminants**
- RT atmospheric composition
- fallout
- nuclear radiation
- radiation effects
- radiation hazards

### *radioactive dating*

USE **radioactive age determination**

### $\infty$ radioactive debris

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT debris
- fallout
- radioactive materials
- radioactive wastes
- radiogenic materials

### radioactive decay

DEF The spontaneous transformation of a nuclide into one or more nuclides accompanied by the release of radiation.

- GS decay
- . **radioactive decay**
- . . alpha decay

. . neutron emission  
 nuclear reactions  
 . **radioactive decay**  
 . . alpha decay  
 . . neutron emission  
 RT emission  
 gamma ray beams  
 gamma rays  
 half life  
 hypernuclei  
 nuclear fission  
 nuclear radiation  
 particle decay  
 photoproduction  
 post-blast nuclear radiation  
 radioactivity  
 radiogenic materials  
 thermonuclear reactions  
 vector currents

*radioactive elements*USE **radioactive isotopes****radioactive isotopes**

UF *radioactive elements*  
*radioactive nuclides*  
*radionuclides*  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **radioactive isotopes**  
 . . . . astatine isotopes  
 . . . . beryllium 7  
 . . . . beryllium 9  
 . . . . beryllium 10  
 . . . . carbon 14  
 . . . . cerium 137  
 . . . . cerium 144  
 . . . . cesium 134  
 . . . . cesium 137  
 . . . . cesium 144  
 . . . . cobalt 58  
 . . . . cobalt 60  
 . . . . copper isotopes  
 . . . . gold 198  
 . . . . indium isotopes  
 . . . . iodine 125  
 . . . . iodine 131  
 . . . . iodine 132  
 . . . . iron 59  
 . . . . krypton 85  
 . . . . niobium 95  
 . . . . nitrogen 16  
 . . . . phosphorus 32  
 . . . . polonium 208  
 . . . . polonium 209  
 . . . . polonium 210  
 . . . . potassium 38  
 . . . . potassium 40  
 . . . . rubidium 86  
 . . . . sodium 22  
 . . . . sodium 24  
 . . . . strontium 85  
 . . . . strontium 88  
 . . . . strontium 89  
 . . . . strontium 90  
 . . . . transuranium elements  
 . . . . americium  
 . . . . . americium isotopes  
 . . . . . americium 241  
 . . . . . berkelium  
 . . . . . californium  
 . . . . . californium isotopes  
 . . . . . curium  
 . . . . . curium isotopes  
 . . . . . curium 242  
 . . . . . curium 244  
 . . . . . einsteinium  
 . . . . . fermium  
 . . . . . lawrencium  
 . . . . . mendelevium  
 . . . . . neptunium  
 . . . . . neptunium isotopes  
 . . . . . nobelium  
 . . . . . plutonium  
 . . . . . plutonium isotopes  
 . . . . . plutonium 238  
 . . . . . plutonium 239  
 . . . . . plutonium 240

. . . . . plutonium 241  
 . . . . . plutonium 244  
 . . . . . sergenium  
 . . . . . tritium  
 . . . . . uranium 232  
 . . . . . uranium 233  
 . . . . . uranium 238  
 . . . . . xenon 133  
 . . . . . xenon 135  
 . . . . . zirconium 95  
 RT actinide series  
 arsenic isotopes  
 gold isotopes  
 isotope effect  
 isotopic labeling  
 radiocardiography  
 radioisotope batteries  
 radioisotope heat sources  
 radiophosphors  
 rhenium isotopes

**radioactive materials**

RT actinide series  
 fissile fuels  
 fission products  
 fissionable materials  
 ionizing radiation  
 isotopes  
 ∞ materials  
 nuclear fission  
 nuclear radiation  
 radiation hazards  
 radiation sources  
 ∞ radioactive debris  
 radioactivity  
 radiobiology  
 radiochemistry  
 uranium plasmas

*radioactive nuclides*USE **radioactive isotopes****radioactive wastes**

UF *nuclear wastes*  
 GS wastes  
 . **radioactive wastes**  
 RT contamination  
 decommissioning  
 environment pollution  
 environment protection  
 environmental surveys  
 fission products  
 hazardous material disposal (in space)  
 nonpoint sources  
 plasma core reactors  
 poisoning (reaction inhibition)  
 pollution  
 radiation hazards  
 ∞ radioactive debris  
 radiochemistry  
 radiogenic materials  
 soil pollution  
 solid wastes  
 waste disposal

**radioactivity**

DEF Spontaneous disintegration of atomic nuclei with emission of corpuscular or electromagnetic radiations. The number of spontaneous disintegrations per unit mass and per unit time of a given unstable (radioactive) element, usually measured in curies.

RT ∞ activity  
 alpha particles  
 emission  
 fallout  
 fission products  
 gamma rays  
 geochemistry  
 geophysics  
 half life  
 ionizing radiation  
 nuclear radiation  
 particle production  
 post-blast nuclear radiation  
 ∞ radiation  
 radiation hazards  
 radioactive decay  
 radioactive materials

radiochemistry

**radiobiology**

DEF The study of the effects produced on living organisms by radiation.  
 GS medical science  
 . nuclear medicine  
 . . **radiobiology**  
 RT antiradiation drugs  
 ∞ biology  
 biomagnetism  
 dosimeters  
 health physics  
 immunoassay  
 irradiation  
 ∞ medicine  
 nuclear radiation  
 radioactive materials  
 radiochemistry  
 radioimmunoassay

**radiocardiography**

DEF The technique of recording an intravenously injected radioisotope in the heart chambers.  
 GS bioengineering  
 . biometrics  
 . . **radiocardiography**  
 RT cardiology  
 radioactive isotopes

**radiochemical separation**

GS radiochemistry  
 . **radiochemical separation**  
 RT chemical reactions  
 quantitative analysis  
 ∞ separation

**radiochemistry**

UF *reactor chemistry*  
 GS **radiochemistry**  
 . radiochemical separation  
 RT chemical analysis  
 ∞ chemistry  
 ionizing radiation  
 isotopic labeling  
 nuclear chemistry  
 nuclear radiation  
 nuclear research  
 radioactive age determination  
 radioactive materials  
 radioactive wastes  
 radioactivity  
 radiobiology

**radiogenic materials**

RT nuclear reactions  
 radioactive age determination  
 ∞ radioactive debris  
 radioactive decay  
 radioactive wastes  
 transmutation

**radiogoniometers**

GS measuring instruments  
 . goniometers  
 . . **radiogoniometers**  
 RT radio direction finders

**radiography**

UF *cinelfluorography*  
*cineradiography*  
 GS imagery  
 . **radiography**  
 . . angiography  
 . . autoradiography  
 . . neutron radiography  
 . . tomography  
 . . . computer aided tomography  
 . . . urography  
 RT Bragg angle  
 crystallography  
 ∞ flash  
 irradiation  
 lixiscopes  
 ∞ materials tests  
 metallography  
 nondestructive tests  
 photography  
 pneumography

## radioimmunoassay

- radiology
- x ray analysis
- x ray apparatus
- x ray astronomy
- x ray diffraction
- x ray fluorescence
- x ray imagery
- x ray inspection
- x ray spectroscopy
- x ray telescopes
- x ray tubes
- x rays

### radioimmunoassay

DEF A medical diagnostic procedure for the components (hormones and immunoglobulins primarily) as well as pharmaceuticals in the blood. The RIA is based on the antigen antibody reactions.

- GS immunoassay
  - . **radioimmunoassay**
- RT antigens
- assaying
- biochemistry
- immunology
- radiobiology

### radioisotope batteries

- UF *atomic batteries*
- GS electric generators
  - . direct power generators
  - . . **radioisotope batteries**
  - . . . SNAP 7
  - . . . SNAP 9A
  - . . . SNAP 11
  - . . . SNAP 13
  - . . . SNAP 15
  - . . . SNAP 17
  - . . . SNAP 19
  - . . . SNAP 21
  - . . . SNAP 23
  - . . . SNAP 27
  - . . . SNAP 29
- RT electric batteries
- fission electric cells
- nuclear auxiliary power units
- radioactive isotopes
- radioisotope heat sources
- thermionic converters
- thermoelectric generators

### radioisotope heat sources

(added December 2002)

DEF Heat sources comprised of encapsulated radioactive isotopes; often used as heat units in thermoelectric generators.

- UF *General Purpose Heat Sources*  
*GPHS (nucleonics)*
- GS heat sources
  - . **radioisotope heat sources**
- RT radioactive isotopes
- radioisotope batteries
- thermoelectric power generation

### radiology

- GS medical science
  - . **radiology**
- RT aerospace medicine
- ∞ medicine
- ∞ radiation
- radiography
- x ray analysis
- x rays

### radiolysis

- GS chemical reactions
  - . photochemical reactions
  - . . **radiolysis**
  - decomposition
    - . **radiolysis**
  - dissociation
    - . **radiolysis**
  - radiation chemistry
    - . **radiolysis**
  - radiation effects
    - . **radiolysis**
- RT photolysis

### radiometeorographs

- GS measuring instruments

- . meteorological instruments
- . . **radiometeorographs**
- radio equipment
- . radio transmitters
- . . **radiometeorographs**
- recording instruments
- . **radiometeorographs**
- transmitters
- . radio transmitters
- . . **radiometeorographs**
- RT radio telemetry
- radiosondes

### radiometers

DEF Instruments for detecting and, usually, measuring radiant energy.

- GS measuring instruments
- . radiation measuring instruments
- . . actinometers
- . . . **radiometers**
- . . . . Dicke radiometers
- . . . . infrared detectors
- . . . . . FLIR detectors
- . . . . . infrared radiometers
- . . . . . Advanced Very High Resolution Radiometer
- . . . . . infrared scanners
- . . . . . visible infrared spin scan radiometer
- . . . . . quantum well infrared photodetectors
- . . . . . microwave radiometers
- . . . . . Advanced Microwave Sounding Unit
- . . . . . passive L-band radiometers
- . . . . . pressure modulator radiometers
- . . . . . spectroradiometers
- . . . . . MISR (radiometry)
- . . . . . MODIS (radiometry)
- RT bolometers
- forest fire detection
- horizon scanners
- infrared photography
- infrared tracking
- Knudsen gages
- photometers
- pyranometers
- radiometric resolution
- spectrophotometers
- thermistors
- ultraviolet detectors
- x ray detectors

### radiometric correction

DEF An effort to correct the intensity range of an image. Used for radiometric rectification.

- UF *radiometric rectification*
- RT image enhancement
- infrared radiometers
- multispectral band scanners
- vegetative index

### radiometric rectification

- USE **radiometric correction**

### radiometric resolution

DEF The sensitivity of the sensor to distinguish between gray levels.

- GS resolution
- . **radiometric resolution**
- RT multispectral band scanners
- radiometers
- remote sensors
- spectral resolution

### radionuclides

- USE **radioactive isotopes**

### radiopathology

- GS medical science
  - . **radiopathology**
- RT antiradiation drugs
- nuclear medicine
- radiation sickness

### radiophosphors

- GS phosphors
- . **radiophosphors**

- RT radioactive isotopes

### radioprotective agents

- USE **antiradiation drugs**

### radiosensitivity

- USE **radiation tolerance**

### radiosondes

DEF Instruments, usually balloonborne, for the simultaneous measurement and transmission of meteorological data while moving vertically through the atmosphere.

- GS measuring instruments
- . meteorological instruments
- . . **radiosondes**
- . . . ionosondes
- . . . rawinsondes
- . sondes
- . . **radiosondes**
- . . . ionosondes
- . . . rawinsondes
- radio equipment
- . radio transmitters
- . . **radiosondes**
- . . . ionosondes
- . . . rawinsondes
- transmitters
- . radio transmitters
- . . **radiosondes**
- . . . ionosondes
- . . . rawinsondes

- RT Arcas rocket vehicles
- balloon sounding
- balloon-borne instruments
- dropsondes
- meteorological balloons
- radio meteorology
- radio telemetry
- radiometeorographs
- ROBIN balloons
- satellite sounding
- sounding rockets

### radiotelephones

- GS radio equipment
- . radio transmitters
- . . **radiotelephones**
- receivers
- . **radiotelephones**
- telecommunication
- . **radiotelephones**
- telephones
- . **radiotelephones**
- transmitters
- . radio transmitters
- . . **radiotelephones**
- RT echo suppressors
- radio communication
- telephony
- voice communication

### radiotherapy

- USE **radiation therapy**

### radium

- GS chemical elements
- . actinide series
- . . **radium**
- . . . radium isotopes
- . . . . radium 226
- metals
- . actinide series
- . . **radium**
- . . . radium isotopes
- . . . . radium 226

### radium 226

- GS chemical elements
- . actinide series
- . . radium
- . . . radium isotopes
- . . . . **radium 226**
- . nuclides
- . . isotopes
- . . . radium isotopes
- . . . . **radium 226**
- metals
- . actinide series
- . . radium

- ... radium isotopes
- ... **radium 226**
- radium isotopes**
  - GS chemical elements
    - . actinide series
    - . radium
    - ... **radium isotopes**
    - ... radium 226
    - . nuclides
    - . isotopes
    - ... **radium isotopes**
    - ... radium 226
    - metals
      - . actinide series
      - . radium
      - ... **radium isotopes**
      - ... radium 226
- radius*
  - USE **radii**
- radome materials**
  - GS dielectrics
    - . **radome materials**
  - RT electromagnetic wave transmission
    - ∞ materials
    - radar transmission
    - radio transmission
    - radomes
    - transparence
- radomes**
  - DEF Dielectric housings for antennas.  
(From RAdar DOME. Pronounced ray-domes.)
  - GS housings
    - . **radomes**
    - shells (structural forms)
    - . domes (structural forms)
    - ... **radomes**
  - RT inflatable structures
    - protuberances
    - radant
    - radar antennas
    - radar equipment
    - radome materials
- radon**
  - GS chemical elements
    - . rare gases
    - ... **radon**
    - ... radon isotopes
    - gases
      - . rare gases
      - ... **radon**
      - ... radon isotopes
- radon isotopes**
  - UF *thoron*
  - GS chemical elements
    - . nuclides
    - . isotopes
    - ... **radon isotopes**
    - . rare gases
    - . radon
    - ... **radon isotopes**
    - gases
      - . rare gases
      - . radon
      - ... **radon isotopes**
- Raduga satellite**
  - DEF A Soviet communications satellite in geostationary orbit for radio and TV transmission.
  - GS artificial satellites
    - . communication satellites
    - . **Raduga satellite**
    - . Soviet satellites
- ... **Raduga satellite**
- RAE 1
  - USE **Explorer 49 satellite**
- RAE 2
  - USE **Explorer 49 satellite**
- RAE B
  - USE **Explorer 49 satellite**
- RAE-1
  - USE **Explorer 38 satellite**
- Raffaello Logistics Module (ISS)*  
(added April 2005)
  - USE **Multi-Purpose Logistics Modules**
- rafts**
  - GS **rafts**
    - . life rafts
  - RT floats
    - lifeboats
    - survival equipment
- rail transportation**
  - UF *railroads*
  - GS transportation
    - . **rail transportation**
  - RT automated guideway transit vehicles
    - automated transit vehicles
    - locomotives
    - magnetic levitation vehicles
    - marine transportation
    - rails
    - rapid transit systems
    - surface vehicles
    - urban transportation
- railgun accelerators**
  - DEF Linear dc motors consisting of a pair of rigid, field-producing rails, and a movable conducting armature.
  - RT ∞ accelerators
    - hypervelocity guns
    - hypervelocity launchers
    - mass drivers
    - nuclear fusion
    - particle accelerators
    - spacecraft launching
- railroad humping tests**
  - RT cargo
    - impact acceleration
    - materials handling
    - shock tests
    - ∞ tests
- railroads*
  - USE **rail transportation**
- rails**
  - RT rail transportation
    - rapid transit systems
    - surface vehicles
- rain**
  - GS precipitation (meteorology)
    - . **rain**
    - . . acid rain
  - RT aquifers
    - cloud seeding
    - condensation nuclei
    - flood predictions
    - hydrology
    - hydrology models
    - limnology
    - precipitation measurement
    - rainbows
    - raindrops
    - rainstorms
    - ∞ showers
    - thunderstorms
    - TRMM satellite
    - watersheds
- rain erosion**
  - DEF The wearing away of the land by rain.
  - GS erosion
    - . **rain erosion**
  - RT landslides
- mud
- sands
- soil erosion
- rain forests**
  - GS resources
    - . Earth resources
    - . . forests
    - ... **rain forests**
  - RT canopies (vegetation)
    - geobotany
    - plants (botany)
    - ∞ showers
    - tropical regions
    - vegetation
- rain gages**
  - UF *pluviographs*
  - GS measuring instruments
    - . meteorological instruments
    - . . **rain gages**
  - RT precipitation measurement
- rain impact damage**
  - GS damage
    - . impact damage
    - . . **rain impact damage**
  - RT arroyos
    - erosion
    - soil erosion
    - water erosion
- rainbows**
  - GS distribution (property)
    - . radiation distribution
    - . . diffraction patterns
    - ... **rainbows**
  - RT halos
    - light transmission
    - rain
- raindrops**
  - GS particles
    - . drops (liquids)
    - . . **raindrops**
  - RT drop size
    - falling spheres
    - rain
    - rainmaking
- rainmaking**
  - GS weather modification
    - . **rainmaking**
  - RT climatology
    - cloud seeding
    - precipitation (meteorology)
    - raindrops
    - water resources
- rainstorms**
  - GS storms
    - . storms (meteorology)
    - . . **rainstorms**
    - . . . thunderstorms
  - RT acid rain
    - flood control
    - flood predictions
    - hailstorms
    - precipitation (meteorology)
    - rain
    - ∞ showers
    - storm damage
    - storm enhancement
    - storm suppression
    - tornadoes
- ∞ **rakes**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT pressure sensors
  - slopes
- ∞ **ram**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT antiradar coatings
  - rams (presses)



## ram accelerators

rams (pumps)

### ram accelerators

(added July 1994)

UF *ramjet-in-tube accelerators*

RT ∞ accelerators

detonation waves

hypervelocity guns

hypervelocity launchers

ramjet engines

### RAM B launch vehicle

GS launch vehicles

. **RAM B launch vehicle**

rocket vehicles

. multistage rocket vehicles

. . **RAM B launch vehicle**

RT solid propellant rocket engines

TX-354 engine

*ram effect (hydrodynamics)*

USE **hydrodynamic ram effect**

*RAM project*

USE **Radio Attenuation Measurement project**

*Raman effect*

USE **Raman spectra**

### Raman lasers

GS stimulated emission devices

. lasers

. . **Raman lasers**

*Raman scattering*

USE **Raman spectra**

### Raman spectra

DEF Spectra of the modified frequencies resulting from inelastic scattering when matter is irradiated by a monochromatic beam of radiant energy. Used for Raman effect and Raman scattering.

UF *Raman effect*

*Raman scattering*

GS molecular properties

. molecular spectra

. . **Raman spectra**

scattering

. wave scattering

. . electromagnetic scattering

. . . **Raman spectra**

spectra

. molecular spectra

. . **Raman spectra**

. radiation spectra

. . electromagnetic spectra

. . . **Raman spectra**

RT absorption spectra

emission spectra

light (visible radiation)

line spectra

molecular rotation

nonlinear optics

vibrational spectra

### Raman spectroscopy

UF *coherent anti-Stokes Raman spectroscopy*

GS spectroscopy

. molecular spectroscopy

. . **Raman spectroscopy**

RT astronomical spectroscopy

infrared spectroscopy

laser-induced breakdown

spectroscopy

line spectra

optogalvanic spectroscopy

Rayleigh scattering

spectroscopic analysis

### ramjet engines

DEF Jet engines with no mechanical compressor consisting of specially shaped tubes or ducts open at both ends, the air necessary for combustion being shoved into the duct and compressed by the forward motion of the engine, where the air passes through a diffuser and is mixed with fuel and burned, the exhaust

gases issuing in a jet from the rear opening. Ramjet engines cannot operate under static conditions. Often called ramjets. Used for athodyds.

UF *athodyds*

GS engines

. air breathing engines

. . gas turbine engines

. . . jet engines

. . . . **ramjet engines**

. . . . . integral rocket ramjets

. . . . . low volume ramjet engines

. . . . . pulsejet engines

. . . . . supersonic combustion ramjet

engines

. . . . . turboramjet engines

. internal combustion engines

. . gas turbine engines

. . . jet engines

. . . . **ramjet engines**

. . . . . integral rocket ramjets

. . . . . low volume ramjet engines

. . . . . pulsejet engines

. . . . . supersonic combustion ramjet

engines

. . . . . turboramjet engines

. turbine engines

. . gas turbine engines

. . . jet engines

. . . . **ramjet engines**

. . . . . integral rocket ramjets

. . . . . low volume ramjet engines

. . . . . pulsejet engines

. . . . . supersonic combustion ramjet

engines

. . . . . turboramjet engines

RT dump combustors

hydrogen fuels

Meteor 1 rocket vehicle

Navaho missile

ram accelerators

rocket-based combined-cycle engines

Saenger space transportation system

supersonic low altitude missile

turbojet engines

### ramjet missiles

GS missiles

. **ramjet missiles**

. . Navaho missile

. . supersonic low altitude missile

RT air to air missiles

antiaircraft missiles

supersonic combustion ramjet

engines

surface to air missiles

surface to surface missiles

*ramjet-in-tube accelerators*

USE **ram accelerators**

### ramp functions

GS functions (mathematics)

. **ramp functions**

RT dynamic response

frequency response

∞ ramps

reaction time

slopes

step functions

∞ ramps

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT ramp functions

ramps (structures)

### ramps (structures)

RT bridges (structures)

crossings

highways

intake systems

intersections

∞ parking

∞ ramps

slopes

wheelchairs

### rams (presses)

GS presses

. **rams (presses)**

RT hammers

platens

plungers

∞ ram

### rams (pumps)

GS pumps

. **rams (pumps)**

RT plungers

∞ ram

water hammer

### Ramsauer effect

RT ∞ effects

electron scattering

∞ interference

negative resistance devices

rare gases

scattering cross sections

### rand project

GS programs

. projects

. . **rand project**

RT operations research

### random access

DEF The process of obtaining data from, or placing data into, storage when there is no sequential relation governing the access time to successive storage location.

RT Aloha system

computer storage devices

input/output routines

random access memory

random processes

VSAT (network)

### random access memory

GS computer components

. computer storage devices

. . **random access memory**

. . . carbon nanotube based memory

. . . core storage

memory (computers)

. **random access memory**

. . carbon nanotube based memory

. . core storage

RT random access

*random distributions*

USE **statistical distributions**

### random errors

DEF Errors that are not systematic, are not erratic, and are not mistakes.

GS errors

. **random errors**

RT BCH codes

∞ dispersion

probability theory

quality control

sampling

stochastic processes

systematic errors

### random loads

GS loads (forces)

. **random loads**

. . gust loads

RT contact loads

dynamic loads

impact loads

static loads

structural design criteria

transient loads

variable amplitude loading

### random noise

DEF Oscillations whose instantaneous amplitudes occur, as a function of time according to a normal (Gaussian) curve. Used for Gaussian noise.

UF *Gaussian noise*

GS **random noise**

. random signals

RT background noise

channel noise

communication theory

- electromagnetic noise
- ∞ noise
- noise (sound)
- noise generators
- noise spectra
- probability theory
- pseudonoise
- signal to noise ratios
- stochastic processes
- white noise
- random numbers**
- DEF Expressions formed by sets of digits selected from a sequence of digits in which each successive digit is equally likely to be any of the digits.
- RT mathematical tables
- ∞ numbers
- pseudorandom sequences
- random positioning machines*  
(added July 2000)
- USE **clinostats**
- random processes**
- GS stochastic processes
- . **random processes**
- . . random walk
- RT communication theory
- information theory
- intermittency
- Markov processes
- Monte Carlo method
- random access
- statistical analysis
- random sampling**
- DEF The process of selecting units for a sample of size *n* in such a manner that all combinations of *n* units under consideration have an equal or ascertainable chance of being selected as the sample.
- GS sampling
- . **random sampling**
- RT quality control
- random signals**
- GS random noise
- . **random signals**
- RT noise spectra
- signal to noise ratios
- ∞ signals
- stochastic processes
- random variables**
- DEF Variables characterized by random behavior in assuming their different possible values. Mathematically, they are described by their probability distribution, which specifies the possible values of a random variable together with the probability associated (in an appropriate sense) with each value. Random variables are said to be continuous if their possible values extend over a continuum and discrete if their possible values are separated by finite intervals.
- RT functions (mathematics)
- Shannon-Wiener measure
- ∞ statistics
- ∞ variable
- random vibration**
- GS vibration
- . **random vibration**
- RT bending vibration
- flutter
- forced vibration
- lattice vibrations
- linear vibration
- missile vibration
- noise (sound)
- self induced vibration
- structural vibration
- torsional vibration
- random walk**
- GS stochastic processes
- . random processes
- . . **random walk**
- RT Markov chains
- Monte Carlo method
- ∞ **range**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT distance
- orbital position estimation
- range (extremes)
- ranges (facilities)
- range (extremes)**
- UF *extrema*
- Gumbel theory*
- GS **range (extremes)**
- . dynamic range
- . frequency ranges
- . . octaves
- . . radio range
- . . subaudible frequencies
- . proportional limit
- . Roche limit
- RT confidence limits
- constraints
- distance
- domains
- dynamic characteristics
- errors
- functions (mathematics)
- heterogeneity
- horizon
- integral equations
- ∞ limits
- maxima
- mean
- minima
- optimization
- quality control
- ∞ range
- sensitivity
- standard deviation
- statistical tests
- tolerances (mechanics)
- tolerances (physiology)
- ∞ travel
- variability
- variance (statistics)
- range and range rate tracking**
- GS distance
- . **range and range rate tracking**
- radar
- . **range and range rate tracking**
- tracking (position)
- . **range and range rate tracking**
- RT Global Tracking Network
- missile tracking
- optical tracking
- radar tracking
- radio tracking
- satellite tracking
- STDN (network)
- range control*
- USE **trajectory control**
- range errors**
- SN (EXCLUDES ERRORS IN DISTANCE TRAVELED--LIMITED TO ERRORS IN DISTANCE MEASUREMENT)
- DEF Errors in radar range measurement due to the propagation of radio energy through a nonhomogeneous atmosphere. These errors are due to the fact that the velocity of radio wave propagation varies with the index of refraction and that ray travel is not in straight lines through actual atmospheres. The resulting range errors are generally insignificant.
- GS errors
- . **range errors**
- RT accuracy
- boresight error
- distance measuring equipment
- error analysis
- error signals
- range finders**
- UF *range indicators*
- GS measuring instruments
- . distance measuring equipment
- . . **range finders**
- . . . optical range finders
- . . . . laser range finders
- RT altimeters
- fire control
- geodimeters
- laser ranger/tracker
- lunar rangefinding
- navigation aids
- position indicators
- radar equipment
- rangefinding
- sound localization
- space perception
- stadimeters
- tellurometers
- range indicators*
- USE **range finders**
- range measurement*
- USE **rangefinding**
- range resources**
- GS resources
- . Earth resources
- . . **range resources**
- range safety**
- GS safety
- . **range safety**
- RT aerospace safety
- impact prediction
- missile ranges
- test ranges
- trajectory control
- rangefinding**
- UF *range measurement*
- ranging*
- GS **rangefinding**
- . airborne range and orbit determination
- . laser ranging
- . lunar rangefinding
- . sound ranging
- . . satellite laser ranging
- RT ballistic cameras
- laser ranger/tracker
- Marots (ESA)
- ∞ measurement
- radar measurement
- radar tracking
- radio tracking
- range finders
- tracking (position)
- rangelands**
- DEF Land providing forage for domestic and wild animals, wildlife cover, recreation opportunities, and vegetation for watershed protection.
- GS land
- . **rangelands**
- RT cattle
- grasslands
- grazing
- livestock
- rural areas
- rural land use
- Rangemaster aircraft*
- USE **G-1 aircraft**
- Ranger 1 lunar probe**
- GS lunar spacecraft
- . lunar probes
- . . Ranger lunar probes
- . . . **Ranger 1 lunar probe**
- unmanned spacecraft
- . space probes
- . . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 1 lunar probe**
- Ranger 2 lunar probe**
- GS lunar spacecraft
- . lunar probes
- . . Ranger lunar probes
- . . . **Ranger 2 lunar probe**
- unmanned spacecraft

## Ranger 3 lunar probe

- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 2 lunar probe**

### Ranger 3 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 3 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 3 lunar probe**

### Ranger 4 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 4 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 4 lunar probe**
- RT Atlas Agena B launch vehicle

### Ranger 5 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 5 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 5 lunar probe**

### Ranger 6 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 6 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 6 lunar probe**

### Ranger 7 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 7 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 7 lunar probe**

### Ranger 8 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 8 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 8 lunar probe**

### Ranger 9 lunar probe

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger 9 lunar probe**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger 9 lunar probe**

### Ranger block 3 television system

- GS communication equipment
- . spacecraft television
- . . . **Ranger block 3 television system**
- telecommunication
- . spacecraft television

- . . . **Ranger block 3 television system**
- television systems
- . spacecraft television
- . . . **Ranger block 3 television system**

RT  $\infty$  systems

### Ranger lunar landing vehicles

- GS lunar spacecraft
- . lunar probes
- . . . Ranger lunar probes
- . . . . **Ranger lunar landing vehicles**
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . Ranger lunar probes
- . . . . . **Ranger lunar landing vehicles**
- RT BE-3 engine
- $\infty$  vehicles

### Ranger lunar probes

- UF *Ranger satellites*
- GS lunar spacecraft
- . lunar probes
- . . . **Ranger lunar probes**
- . . . . Ranger 1 lunar probe
- . . . . Ranger 2 lunar probe
- . . . . Ranger 3 lunar probe
- . . . . Ranger 4 lunar probe
- . . . . Ranger 5 lunar probe
- . . . . Ranger 6 lunar probe
- . . . . Ranger 7 lunar probe
- . . . . Ranger 8 lunar probe
- . . . . Ranger 9 lunar probe
- . . . . Ranger lunar landing vehicles
- unmanned spacecraft
- . space probes
- . . . lunar probes
- . . . . **Ranger lunar probes**
- . . . . . Ranger 1 lunar probe
- . . . . . Ranger 2 lunar probe
- . . . . . Ranger 3 lunar probe
- . . . . . Ranger 4 lunar probe
- . . . . . Ranger 5 lunar probe
- . . . . . Ranger 6 lunar probe
- . . . . . Ranger 7 lunar probe
- . . . . . Ranger 8 lunar probe
- . . . . . Ranger 9 lunar probe
- . . . . . Ranger lunar landing vehicles
- RT Atlas Agena B launch vehicle

### Ranger project

- GS programs
- . NASA programs
- . . . NASA space programs
- . . . . **Ranger project**
- . . . . . Agena B Ranger Program
- . projects
- . . . **Ranger project**
- . . . . Agena B Ranger Program
- . space programs
- . . . NASA space programs
- . . . . **Ranger project**
- . . . . . Agena B Ranger Program
- RT Agena B rocket vehicle
- Agena rocket vehicles
- Atlas launch vehicles
- lunar photographs
- lunar photography
- lunar probes

*Ranger satellites*

USE **Ranger lunar probes**

### ranges (facilities)

- GS **ranges (facilities)**
- . test ranges
- . . . ballistic ranges
- . . . . missile ranges
- RT radio beacons
- $\infty$  range

*ranging*

USE **rangefinding**

### rank tests

- GS statistical analysis
- . statistical tests
- . . . **rank tests**

RT  $\infty$  tests

### Rankine cycle

DEF An ideal thermodynamic cycle consisting of heat addition at constant pressure, isentropic expansion, heat rejection at constant pressure, and isentropic compression; used as an ideal standard for the performance of heat-engine and heat-pump installations operating with a condensable vapor as the working fluid, such as a steam power plant.

GS cycles

. thermodynamic cycles

. . . **Rankine cycle**

- RT ASTEC solar turboelectric generator
- Brayton cycle
- Carnot cycle
- laser propulsion
- Otto cycle
- solar dynamic power systems
- solar generators
- thermodynamics

### Rankine-Hugoniot relation

- RT aerothermodynamics
- $\infty$  density
- . pressure gradients
- . shock wave propagation

### ranking

- RT arrays
- comparison
- evaluation
- ratings
- selection
- sequencing
- value

### Raoult law

- RT composition (property)
- Henry law
- partial pressure
- solutions
- vapor pressure

*RAPCON (control)*

USE **radar approach control**

### rapid ballistics identification

- GS identifying
- . **rapid ballistics identification**
- RT display devices
- imaging techniques
- laser applications
- lasers
- measuring instruments
- photography
- scanning
- stimulated emission
- stimulated emission devices

### rapid eye movement state

- UF *desynchronized sleep*
- REMS*
- RT dreams
- eye movements
- sleep

### rapid prototyping

*(added November 2001)*

DEF The fabrication of functional prototypes within a short turn-around time in order to support model verification, reduce design-cycle time, or reduce the overall cost of development. A set of advanced manufacturing technologies that can quickly generate three-dimensional objects directly from computer-based models.

- RT computer aided design
- computer aided manufacturing
- cost reduction
- fabrication
- product development
- prototypes
- three dimensional models

### rapid quenching (metallurgy)

DEF Rapid cooling of molten metals or alloys to achieve maximum uniformity in the crystal structure. Used for rapid solidification.

UF *rapid solidification*

- GS cooling  
 . quenching (cooling)  
 . . **rapid quenching (metallurgy)**
- RT crystal growth  
 crystal lattices  
 crystal structure  
 ∞ metallurgy  
 ∞ quenching
- rapid solidification*  
 USE **rapid quenching (metallurgy)**  
**solidification**
- rapid transit systems**  
 UF *high speed transportation*  
 GS transportation  
 . **rapid transit systems**
- RT air transportation  
 automated guideway transit vehicles  
 automated transit vehicles  
 cargo  
 ground effect machines  
 highways  
 logistics  
 passengers  
 rail transportation  
 rails  
 roads  
 ∞ systems  
 ∞ transport vehicles  
 transportation networks  
 urban transportation
- rapids**  
 RT meanders  
 river basins  
 rivers  
 streams  
 water currents  
 water flow
- rare earth alloys**  
 GS alloys  
 . **rare earth alloys**  
 . . erbium alloys  
 . . gadolinium alloys  
 . . lanthanum alloys  
 . . mischmetal  
 . . neodymium alloys
- RT yttrium alloys
- rare earth compounds**  
 GS **rare earth compounds**  
 . cerium compounds  
 . . bastnasite  
 . . cerium oxides  
 . . dysprosium compounds  
 . . erbium compounds  
 . . europium compounds  
 . . lanthanum tellurides  
 . . lutetium compounds  
 . . neodymium compounds  
 . . praseodymium compounds  
 . . samarium compounds  
 . . scandium compounds  
 . . scandium oxides  
 . . terbium compounds  
 . . thulium compounds  
 . . ytterbium compounds
- RT ∞ chemical compounds  
 ∞ Group 3B compounds  
 ∞ metal compounds
- rare earth elements**  
 UF *lanthanide series metals*  
 GS chemical elements  
 . **rare earth elements**  
 . . cerium  
 . . . cerium isotopes  
 . . . . cerium 137  
 . . . . cerium 144  
 . . dysprosium  
 . . . dysprosium isotopes  
 . . erbium  
 . . . erbium isotopes  
 . . europium  
 . . . europium isotopes  
 . . gadolinium  
 . . . gadolinium isotopes  
 . . holmium  
 . . . holmium isotopes  
 . . lanthanum  
 . . . lanthanum isotopes  
 . . lutetium  
 . . . lutetium isotopes  
 . . neodymium  
 . . . neodymium isotopes  
 . . praseodymium  
 . . . praseodymium isotopes  
 . . promethium  
 . . . promethium isotopes  
 . . samarium  
 . . . samarium isotopes  
 . . scandium  
 . . . scandium isotopes  
 . . terbium  
 . . . terbium isotopes  
 . . thulium  
 . . . thulium isotopes  
 . . ytterbium  
 . . . ytterbium isotopes  
 . . yttrium  
 . . . yttrium isotopes
- RT alkali vapor lamps  
 krep  
 neodymium lasers  
 transition metals
- ∞ **rare gas compounds**  
 SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)  
 RT ∞ chemical compounds  
 excimer lasers  
 excimers  
 helium compounds  
 xenon compounds
- rare gases**  
 DEF Gases such as helium, neon, argon,  
 krypton, xenon, and radon, all of whose shells of  
 planetary electrons contain stable numbers of  
 electrons so that the atoms are almost com-  
 pletely chemically inactive. Used for inert gases  
 and noble gases.  
 UF *inert gases*  
*noble gases*  
 GS chemical elements  
 . **rare gases**  
 . . argon  
 . . . argon isotopes  
 . . helium  
 . . . helium isotopes  
 . . . . liquid helium  
 . . . . liquid helium 2  
 . . krypton  
 . . . krypton isotopes  
 . . . . krypton 85  
 . . neon  
 . . . liquid neon  
 . . . neon isotopes  
 . . radon  
 . . . radon isotopes  
 . . xenon  
 . . . xenon isotopes  
 . . . . xenon 129  
 . . . . xenon 133  
 . . . . xenon 135  
 gases  
 . **rare gases**  
 . . argon  
 . . . argon isotopes  
 . . helium  
 . . . helium isotopes  
 . . . . liquid helium  
 . . . . liquid helium 2  
 . . krypton  
 . . . krypton isotopes  
 . . . . krypton 85  
 . . neon  
 . . . liquid neon  
 . . . neon isotopes  
 . . radon  
 . . . radon isotopes  
 . . xenon  
 . . . xenon isotopes  
 . . . . xenon 129  
 . . . . xenon 133  
 . . . . xenon 135
- RT monatomic gases  
 nonpolar gases  
 Ramsauer effect
- rare gas-halide lasers**  
 DEF A class of lasers in which the inert  
 gases are used as the amplifying medium.  
 GS stimulated emission devices  
 . lasers  
 . . gas lasers  
 . . . **rare gas-halide lasers**  
 . . . . krypton fluoride lasers  
 . . . . xenon chloride lasers  
 . . . . xenon fluoride lasers
- RT coherent light  
 laser pumping  
 lasing  
 light beams  
 optical pumping  
 stimulated emission
- rarefaction**  
 RT antinodes  
 compressing  
 elastic waves  
 expansion  
 vacuum
- rarefaction waves*  
 USE **elastic waves**
- rarefied gas dynamics**  
 GS mechanics (physics)  
 . fluid mechanics  
 . . fluid dynamics  
 . . . gas dynamics  
 . . . . **rarefied gas dynamics**
- RT atomic beams  
 BGK model  
 Chapman-Enskog theory  
 continuum flow  
 ∞ dynamics  
 free molecular flow  
 Knudsen flow  
 low density flow  
 low density wind tunnels  
 molecular beams  
 molecular flow  
 plasmas (physics)  
 slip flow

**rarefied gases**

transition flow

**rarefied gases**

UF *low density gases*

GS **gases**

- . **rarefied gases**
- . . . cosmic gases
- . . . interplanetary gas
- . . . interstellar gas

RT

- electron gas
- free molecular flow
- gas density
- gas temperature
- high temperature gases
- low density flow
- low density research
- molecular gases

**rarefied plasmas**

GS **gases**

- . **rarefied plasmas**
- particles
- . charged particles
- . . . energetic particles
- . . . plasmas (physics)
- . . . . **rarefied plasmas**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **rarefied plasmas**

RT

- cathode glow
- cold plasmas
- collisionless plasmas
- electron plasma
- nonuniform plasmas

*rasers*

USE **masers**

**raster scanning**

DEF Sweeping a cathode ray screen or an antenna beam characterized by a network of parallel sweeps either from side to side or from top to bottom.

GS *imaging techniques*

. **raster scanning**

RT

- cathode ray tubes
- computer graphics
- display devices
- image processing
- images
- picture tubes
- television cameras

*rate meters*

USE **measuring instruments**

**rate of climb indicators**

GS *aircraft instruments*

. **rate of climb indicators**

RT

- altimeters
- flight instruments

∞ *indicators*

**rates (per time)**

GS **rates (per time)**

- . acceleration (physics)
- . . angular acceleration
- . . deceleration
- . . . spin reduction
- . . electron acceleration
- . . high acceleration
- . . high gravity environments
- . . impact acceleration
- . . particle acceleration
- . . plasma acceleration
- . . transverse acceleration
- . acoustic velocity
- . airspeed
- . angular velocity
- . bit error rate
- . burning rate
- . collision rates
- . critical velocity
- . decay rates
- . . electron decay rate
- . drift rate
- . escape velocity

- . evaporation rate
- . exhaust velocity
- . flow velocity
- . . solar wind velocity
- . flux (rate)
- . . heat flux
- . . magnetic flux
- . . solar flux
- . flux density
- . . current density
- . . photon density
- . . radiant flux density
- . . irradiance
- . . . illuminance
- . . . solar constant
- . . lumens
- . . luminous intensity
- . . . illuminance
- . . luminance
- . . particle flux density
- . . . electron flux density
- . . . neutron flux density
- . . . proton flux density
- . . radiance
- . . radiancy
- . . solar flux density
- . . . solar constant
- . . sound intensity
- . . zero sound
- . ground speed
- . group velocity
- . heart rate
- . . arrhythmia
- . . bradycardia
- . . tachycardia
- . high speed
- . hypersonic speed
- . ion production rates
- . landing speed
- . light speed
- . loading rate
- . low speed
- . mass flow rate
- . orbital velocity
- . phase velocity
- . physiological acceleration
- . propagation velocity
- . pulse rate
- . . pulse repetition rate
- . radial velocity
- . recombination coefficient
- . relativistic velocity
- . respiratory rate
- . . dyspnea
- . . hypoventilation
- . . tachypnea
- . rotor speed
- . signal fading rate
- . solar velocity
- . star formation rate
- . strain energy release rate
- . strain rate
- . subsonic speed
- . supersonic speed
- . systole
- . terminal velocity
- . tip speed
- . transmission rate (communications)
- . transonic speed
- . wind velocity
- . . solar wind velocity

RT

- access time
- MTBF
- solitary waves
- time functions
- time measurement
- volume

**ratings**

GS **ratings**

- . pilot ratings
  - . . Cooper-Harper ratings
- RT assessments
- consistency
  - evaluation
  - normalizing (statistics)
- ∞ performance
- position (title)

ranking

**ratiometers**

GS *measuring instruments*

. **ratiometers**

**rational functions**

- GS *analysis (mathematics)*
- . complex variables
- . . meromorphic functions
- . . . **rational functions**
- functions (mathematics)
- . meromorphic functions
- . . **rational functions**

**rations**

GS **rations**

- . space rations

RT ∞ *food*

**ratios**

UF *percentage*

GS **ratios**

- . aspect ratio
  - . . fineness ratio
  - . . high aspect ratio
  - . . low aspect ratio
  - . . thickness ratio
  - . Biot number
  - . bypass ratio
  - . compression ratio
  - . fiber volume fraction
  - . Froude number
  - . fuel-air ratio
  - . Grashof number
  - . Hartmann number
  - . hematocrit ratio
  - . indexes (ratios)
  - . . KP index
  - . . morphological indexes
  - . . vegetative index
  - . . . leaf area index
  - . . . normalized difference vegetation index
  - . isotope ratios
  - . Laval number
  - . Lewis numbers
  - . lift drag ratio
  - . likelihood ratio
  - . Mach number
  - . mass ratios
  - . . mass to light ratios
  - . . mixing ratios
  - . . payload mass ratio
  - . . propellant mass ratio
  - . Mills ratio
  - . modular ratios
  - . Nusselt number
  - . Peclet number
  - . perveance
  - . Poisson ratio
  - . Prandtl number
  - . pressure ratio
  - . Rayleigh number
  - . Reynolds number
  - . . high Reynolds number
  - . . low Reynolds number
  - . Brinkman number
  - . Richardson number
  - . scale (ratio)
  - . Schmidt number
  - . signal to noise ratios
  - . similarity numbers
  - . standing wave ratios
  - . Stanton number
  - . stress ratio
  - . Strouhal number
  - . temperature ratio
  - . thrust-weight ratio
  - . void ratio
- RT dynamic range
- efficiency
  - fractals
  - fractions
  - proportion
  - psychological tests
  - refractivity

**rats**

GS *animals*

. vertebrates  
 . . mammals  
 . . . rodents  
 . . . . **rats**

RT animal models  
 mice  
 pocket mice

*RATSCAT program*  
 USE **radar target scatter site program**

*Raven helicopter*  
 USE **OH-23 helicopter**

**ravines**  
 GS landforms  
 . **ravines**

RT canyons  
 erosion  
 river basins  
 topography  
 valleys  
 water erosion

**rawinsondes**  
 DEF Combinations of raob and rawin; observations of temperature, pressure, relative humidity, and winds-aloft by means of radiosonde and radio direction finding equipment of radar tracking.  
 GS measuring instruments  
 . meteorological instruments  
 . . radiosondes  
 . . . **rawinsondes**  
 . sondes  
 . . radiosondes  
 . . . **rawinsondes**  
 radio equipment  
 . radio transmitters  
 . . radiosondes  
 . . . **rawinsondes**  
 transmitters  
 . radio transmitters  
 . . radiosondes  
 . . . **rawinsondes**

RT dropsondes  
 meteorological balloons  
 radar tracking  
 radio tracking  
 wind measurement

*ray acoustics*  
 USE **geometrical acoustics**

*ray casting*  
*(added May 1997)*  
 USE **ray tracing**

*ray optics*  
 USE **geometrical optics**

**ray tracing**  
 DEF A procedure used in the graphical determination of the path followed by a single ray of radiant energy as it travels through media of varying indices of refraction.  
 UF *ray casting*  
 RT diffraction  
 geometrical optics  
 geometrical theory of diffraction  
 gradient index optics  
 grazing incidence  
 optical measurement  
 reflectance  
 tracking (position)  
 transmittance

**Rayleigh distribution**  
 GS functions (mathematics)  
 . probability density functions  
 . . **Rayleigh distribution**  
 statistical analysis  
 . probability density functions  
 . . **Rayleigh distribution**  
 statistical distributions  
 . **Rayleigh distribution**

RT error analysis  
 operations research

radial distribution

**Rayleigh equations**  
 RT  $\infty$  equations  
 flow equations  
 heat transfer  
 thermodynamics

**Rayleigh fading**  
*(added June 2000)*  
 DEF Rapid-fluctuation, small-scale fading resulting from multipath effects, and typically occurring in non-line-of-sight (NLOS) environments.  
 GS fading  
 . signal fading  
 . . **Rayleigh fading**

RT channels (data transmission)  
 mobile communication systems  
 multipath transmission  
 phase shift keying  
 radio signals  
 reception diversity

**Rayleigh number**  
 GS dimensionless numbers  
 . **Rayleigh number**  
 ratios  
 . **Rayleigh number**

RT Benard cells  
 buoyancy  
 Rayleigh-Benard convection

**Rayleigh scattering**  
 DEF Any scattering process produced by spherical particles whose radii are smaller than about one tenth the wavelength of the scattered radiation.  
 GS scattering  
 . wave scattering  
 . . electromagnetic scattering  
 . . . Mie scattering  
 . . . . **Rayleigh scattering**

RT airglow  
 gray gas  
 light scattering  
 Raman spectroscopy  
 sky

**Rayleigh waves**  
 DEF Two dimensional barotropic disturbances in a fluid having one or more discontinuities in the vorticity profile. Surface waves associated with the free boundary of a solid, such that a surface particle describes an ellipse whose major axis is normal to the surface and whose center is at the undisturbed surface. At maximum particle displacement away from the solid surface the motion of the particle is opposite to that of the wave.  
 GS elastic waves  
 . seismic waves  
 . . **Rayleigh waves**

RT barotropic flow  
 fluid flow  
 S waves  
 two dimensional flow

**Rayleigh-Benard convection**  
 DEF The flow of a fluid contained between horizontal thermally conducting plates and heated from below. The Rayleigh number is proportional to the temperature difference between the plates.  
 GS convection  
 . free convection  
 . . **Rayleigh-Benard convection**  
 . . . Benard cells  
 fluid flow  
 . convective flow  
 . . **Rayleigh-Benard convection**  
 . . . Benard cells

RT buoyancy-driven flow  
 convection currents  
 convection-diffusion equation  
 convective heat transfer  
 forced convection  
 hot surfaces  
 laminar flow  
 Rayleigh number

solar convection (astronomy)  
 stellar convection  
 thermal boundary layer

**Rayleigh-Ritz method**  
 GS analysis (mathematics)  
 . numerical analysis  
 . . approximation  
 . . . **Rayleigh-Ritz method**

RT  $\infty$  methodology  
 variational principles

**rayon**  
 DEF A manufactured fiber composed of regenerated cellulose, as well as fibers composed of regenerated cellulose in which substituents have replaced not more than 15 percent of the hydrogens of the hydroxyl groups.  
 GS fibers  
 . synthetic fibers  
 . . **rayon**  
 textiles  
 . **rayon**

$\infty$  rays  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT atmospheric radiation  
 background noise  
 beams (radiation)  
 caustics (optics)  
 coherent radiation  
 continuous radiation  
 corpuscular radiation  
 electromagnetic radiation  
 extraterrestrial radiation  
 gamma rays  
 lunar rays  
 polarized radiation  
 pulsed radiation

**Raytheon computers**  
 GS data processing equipment  
 . computers  
 . . digital computers  
 . . . **Raytheon computers**

**razor blades**  
 GS cutters  
 . blades (cutters)  
 . . **razor blades**

*RB-47 aircraft*  
 USE **B-47 aircraft**

*RB-50 aircraft*  
 USE **B-50 aircraft**

*RB-57 aircraft*  
 USE **B-57 aircraft**

*RB-66 aircraft*  
 USE **B-66 aircraft**

*RBCC engines*  
*(added August 1999)*  
 USE **rocket-based combined-cycle engines**

*RBE*  
 USE **relative biological effectiveness (RBE)**

**RC circuits**  
 UF *RC networks*  
 GS circuits  
 . **RC circuits**

RT capacitance  
 coupling circuits  
 discriminators  
 electric filters  
 electrical resistance  
 LC circuits  
 network analysis  
 network synthesis  
 RLC circuits  
 time constant

## RCA computers

transconductance

### RC networks

USE **RC circuits**

### RCA computers

GS data processing equipment  
. computers  
. . . **RCA computers**  
. . . RCA spectra 70 computer  
. . . RCA-110 computers  
RT data processing

### RCA Satcom satellites

DEF Domestic commercial communications satellites launched by NASA for the RCA Corporation.

GS artificial satellites  
. communication satellites  
. . . **RCA Satcom satellites**  
commercial spacecraft  
. **RCA Satcom satellites**  
RT Delta launch vehicle  
domestic satellite communications systems

### RCA spectra 70 computer

GS data processing equipment  
. computers  
. . . digital computers  
. . . **RCA spectra 70 computer**  
. . . RCA computers  
. . . **RCA spectra 70 computer**

### RCA-110 computers

GS data processing equipment  
. computers  
. . . RCA computers  
. . . **RCA-110 computers**

### RCB stars

USE **R Coronae Borealis stars**

### RDX

UF *cyclotrimethylene trinitramine*  
*trinitrotriazocyclohexane*  
GS explosives  
. **RDX**  
nitrogen compounds  
. azo compounds  
. . . **RDX**  
organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . **RDX**  
propellants  
. **RDX**  
RT pyrotechnics  
solid propellants  
solid rocket propellants

### reactance

GS electrical properties  
. electrical impedance  
. . . **reactance**  
impedance  
. electrical impedance  
. . . **reactance**  
RT capacitance  
electrical resistance  
Foster theory  
inductance  
Smith chart  
transconductance

### reactance amplifiers

USE **parametric amplifiers**

### reacting flow

(added August 1991)

DEF Fluid flows in which chemical reactions are occurring or potentially can occur. Used for chemically reacting flow.

UF *chemically reacting flow*  
GS fluid flow  
. **reacting flow**  
. . . combustible flow  
RT boundary layer combustion  
chemical reactions  
combustion chemistry

detonable gas mixtures  
direct numerical simulation  
flame propagation  
∞ flow  
fuel flow  
premixed flames  
propellant combustion  
reaction kinetics  
turbulent combustion  
turbulent flow

### ∞ reaction

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT chemical reactions  
human reactions  
irritation  
nuclear reactions  
thrust

### reaction bonding

DEF Chemical combining of ingredients to produce silicon nitride ceramics.

GS bonding  
. **reaction bonding**  
RT aluminum  
ceramics  
chemical reactions  
melting points  
nitrogen  
oxygen  
powder metallurgy  
sialon  
silicon  
silicon nitrides  
sintering

### ∞ reaction control

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT chemical reaction control  
∞ control  
directional control  
Marquardt R4D engine  
nuclear reactor control  
reactor safety  
thrust control

### reaction intermediates

(added August 2004)

DEF Substances formed during or contributing towards, the synthesis or metabolism of other products. Reaction intermediates may also be the desired product of two or more initial reacting materials.

GS products  
. reaction products  
. . . **reaction intermediates**  
RT chemical reactions  
reaction kinetics  
synthesis (chemistry)

### reaction jet backpacks

USE **self maneuvering units**

### reaction jets

USE **jet flow**  
**jet thrust**

### reaction kinetics

UF *chemical kinetics*  
*reaction rate*  
GS kinetics  
. **reaction kinetics**  
RT amino radical  
association reactions  
autocatalysis  
catalysis  
chemical equilibrium  
chemical reactions  
combustion chemistry  
Damkohler number  
Fischer-Tropsch process  
half life  
heat of dissociation  
interstellar chemistry  
irreversible processes  
nitrous acid  
nuclear reactions

pressure dependence  
reacting flow  
reaction intermediates  
reaction-diffusion equations  
reagents  
solvation

### reaction products

DEF The substances formed in a chemical reaction -- the desired items as well as the unwanted fumes, sludge, residues, etc.

GS products  
. **reaction products**  
. . . combustion products  
. . . soot  
. . . reaction intermediates  
RT ashes  
by-products  
effluents  
engines  
exhaust gases  
fumes  
gases  
infrared suppression  
jet engines  
precipitates  
residues  
slags  
sludge

### reaction rate

USE **reaction kinetics**

### reaction time

DEF In human engineering, the interval between an input signal (physiological) or a stimulus (psychophysiological) and the response elicited by the signal. Used for reverse time.

UF *reverse time*  
GS time

. **reaction time**

. . . chronaxy  
RT adaptation  
conditioned reflexes  
dynamic characteristics  
dynamic response  
human reactions  
perceptual time constant  
physiological effects  
pontryagin principle  
psychological effects  
psychomotor performance  
ramp functions  
reflexes  
refractory period  
sensitivity  
sensorimotor performance  
step functions  
time constant  
time lag

### reaction wheels

UF *inertia wheels*  
GS wheels  
. **reaction wheels**  
RT attitude control  
counter-rotating wheels  
flywheels

### reaction-diffusion equations

(added July 1994)

RT combustion physics  
convection-diffusion equation  
diffusion coefficient  
∞ equations  
Ficks equation  
partial differential equations  
reaction kinetics  
transport theory

### reactive centers

(added August 2004)

USE **active sites (chemistry)**

### reactivity

DEF The ability to react. For proper use of the term, the reaction in question and the conditions should be stated and the parameter used

in measuring reactivity indicated, such as rate, uniformity, or the like.

- GS **reactivity**
  - . photorefractivity
- RT chemical reactions
  - inhour equation
  - nuclear reactions

*reactor chemistry*

- USE **radiochemistry**

#### reactor cores

DEF In nuclear reactors, the regions containing the fissionable material.

- GS cores
  - . **reactor cores**
- RT annular core pulse reactors
  - control rods
  - nuclear fuel elements
  - nuclear fuels
  - nuclear reactors
- ∞ operators
  - plasma core reactors
  - reflectometers
  - reflectors
  - void ratio

#### reactor design

- RT annular core pulse reactors
  - blankets (fission reactors)
  - blankets (fusion reactors)
  - chemical reactors
  - computer aided design
- ∞ design
  - engine design
  - engineering test reactors
  - Hanford reactors
  - high temperature nuclear reactors
  - limiters (fusion reactors)
  - nuclear reactors
  - nuclear research and test reactors
  - offshore reactor sites
  - organic cooled reactors
  - pebble bed reactors
  - product development

*reactor fuels*

- USE **nuclear fuels**

*reactor in flight test program*

- USE **RIFT (reactor in flight test)**

#### reactor materials

- RT annular core pulse reactors
  - blankets (fission reactors)
  - blankets (fusion reactors)
  - chemical reactors
- ∞ construction materials
  - coolants
  - limiters (fusion reactors)
  - loss of coolant
- ∞ materials
  - materials selection
  - moderators
  - nuclear fuel elements
  - nuclear fuels
  - nuclear reactors
  - pressure vessels
  - radiation shielding
  - spent fuels

#### reactor physics

- GS nuclear physics
  - . **reactor physics**
- RT annular core pulse reactors
  - beta factor
  - Hanford reactors
  - inhour equation
  - nuclear fuel burnup
  - nuclear reactors
- ∞ physics
- ∞ science

#### reactor safety

DEF Theoretical and experimental investigations of the behavior of reactor types and designs under various real or hypothetical accidents.

- GS safety
  - . **reactor safety**

- RT annular core pulse reactors
  - chemical reactors
  - control rods
  - explosions
  - industrial safety
  - nuclear reactor control
  - nuclear reactors
  - offshore reactor sites
  - radiation hazards
- ∞ reaction control
  - relief valves
  - Transient Reactor Test Facility

#### reactor startup tests

- GS fuel tests
  - . **reactor startup tests**
- RT initiation
  - nuclear fuels
  - nuclear reactors
  - starting
- ∞ tests

#### reactor technology

- GS technologies
  - . **reactor technology**
- RT annular core pulse reactors
  - ∞ engineering
    - engineering test reactors
    - Hanford reactors
    - high temperature nuclear reactors
    - Joint European Torus
    - nuclear fuel burnup
    - nuclear reactors
    - nuclear research and test reactors
    - offshore reactor sites
    - organic cooled reactors
    - pebble bed reactors
    - reverse field pinch

#### ∞ reactors

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT annular core pulse reactors
  - chemical reactors
  - electric reactors
  - fast test reactors
  - fusion reactors
  - fusion-fission hybrid reactors
  - high temperature nuclear reactors
  - molten salt nuclear reactors
  - nuclear reactors
  - nuclear research and test reactors
  - plasma core reactors
  - power reactors
  - RIFT (reactor in flight test)
  - SNAPTRAN reactor
  - spheromaks
  - swimming pool reactors
  - thermal reactors
  - tokamak devices
  - water cooled reactors

#### readers

- UF *reading machines*
- RT character recognition
  - conical scanning
- ∞ detectors
  - magnetic tapes
  - microfilms
  - optical data processing
  - optical scanners
  - pattern recognition
  - punched cards
  - punched tapes
  - reading

#### reading

- GS **reading**
  - . lip reading
- RT character recognition
  - conical scanning
  - data transmission
  - display devices
  - input
- ∞ interpretation
  - legibility
  - perception
  - printing
  - readers

- scanners
- scanning
- symbols
- visibility

*reading machines*

- USE **readers**

*readjustment*

- USE **adjusting**

#### read-only memory devices

DEF Computer devices for storing data in permanent or nonerasable form. Used for ROM devices.

- UF *ROM devices*
- GS computer components
  - . computer storage devices
  - . . **read-only memory devices**
  - . . . CD-ROM
- RT computer design
  - computer systems design
  - computers

#### readout

- RT display devices
  - multiple output programs
  - output
  - printers (data processing)
  - printouts
  - remote consoles

#### reagents

- RT catalysts
  - chemical analysis
  - chemical reactions
  - reaction kinetics

#### real gases

- GS gases
  - . **real gases**
- RT equations of state
  - gas density
  - ideal gas
  - kinetic theory
  - molecular gases
  - monatomic gases

#### real numbers

- GS **real numbers**
  - . integers
- RT complex numbers
  - ∞ numbers

#### real time operation

DEF Time in which reporting on events or recording of events is simultaneous with the events.

- RT automatic control
  - computer programming
  - computers
  - display devices
  - integrated mission control center
  - multiprocessing (computers)
  - onboard data processing
  - windows (computer programs)

#### real variables

- GS analysis (mathematics)
  - . **real variables**
  - . . Abel function
  - . . asymptotes
  - . . Bessel functions
  - . . . Hankel functions
  - . . Bethe-Salpeter equation
  - . . calculus of variations
  - . . composite functions
  - . . delta function
  - . . differential equations
  - . . . Blasius equation
  - . . . Chandrasekhar equation
  - . . . cosine series
  - . . . Duffing differential equation
  - . . . Falkner-Skan equation
  - . . . hyperbolic differential equations
  - . . . Lamé wave equations
  - . . . partial differential equations
  - . . . . biharmonic equations
  - . . . . Burger equation
  - . . . . Cauchy-Riemann equations



## reattached flow

- ... elliptic differential equations
- ... Monge-Ampere equation
- ... Euler-Cauchy equations
- ... Ffowcs Williams-Hawkings equation
- ... Fokker-Planck equation
- ... Gauss equation
- ... Helmholtz vorticity equation
- ... Liouville equations
- ... parabolic differential equations
- ... Poisson equation
- ... vlasov equations
- ... Riccati equation
- ... vorticity equations
- ... Helmholtz vorticity equation
- ... Einstein equations
- ... existence theorems
- ... extremum values
- ... limits (mathematics)
- ... maxima
- ... minima
- ... Cramer-Rao bounds
- ... Fourier-Bessel transformations
- ... Green's functions
- ... hyperbolic functions
- ... hyperplanes
- ... Jacobi integral
- ... Jacobi matrix method
- ... kernel functions
- ... Liapunov functions
- ... linear equations
- ... Ffowcs Williams-Hawkings equation
- ... linear evolution equations
- ... Riccati equation
- ... Lipschitz condition
- ... measure and integration
- ... binary integration
- ... Borel sets
- ... functional integration
- ... integral calculus
- ... J integral
- ... Lebesgue theorem
- ... numerical integration
- ... Runge-Kutta method
- ... Stieltjes integral
- ... weighting functions
- ... Neumann problem
- ... nonlinear equations
- ... cubic equations
- ... Duffing differential equation
- ... Monge-Ampere equation
- ... nonlinear evolution equations
- ... quadratic equations
- ... quartic equations
- ... numerical differentiation
- ... periodic functions
- ... trigonometric functions
- ... cosine series
- ... sine series
- ... tangents
- ... series (mathematics)
- ... asymptotic series
- ... Campbell-Hausdorff series
- ... cosine series
- ... Fourier series
- ... Pade approximation
- ... power series
- ... Taylor series
- ... MacLaurin series
- ... progressions
- ... Prony series
- ... sine series
- ... Sturm-Liouville theory
- ... vector analysis
- ... collinearity
- ... coplanarity
- ... curl (vectors)
- ... vorticity
- ... Weierstrass functions
- ... Whittaker functions
- RT aperiodic functions
- calculus
- Cholesky factorization
- complex variables
- continuums
- dependent variables
- differential calculus
- factorization
- Fourier analysis
- Hermitian polynomial
- hyperspheres
- infinity
- inflection points
- maximum principle
- monotone functions
- Schmidt method
- stability derivatives
- uniqueness theorem
- ∞ variable
- rearward facing steps
- USE **backward facing steps**
- reattached flow**
- GS fluid flow
  - . viscous flow
  - . boundary layer flow
  - . . . **reattached flow**
- RT ∞ attachment
- backward facing steps
- boundary layer separation
- Coanda effect
- Crocco-Lee theory
- flow characteristics
- flow distribution
- separated flow
- reattachment
- USE **attachment**
- REB
- USE **relativistic electron beams**
- rebreathing**
- RT air purification
- carbon dioxide concentration
- carbon dioxide removal
- expired air
- life support systems
- spacecraft cabin atmospheres
- receivers**
- DEF Initial components or sensing elements of measuring systems. For example, the receiver of a thermoelectric thermometer is the measuring thermocouple. Instruments used to detect the presence and to determine the information carried by electromagnetic radiation. Receivers include circuits designed to detect, amplify, rectify, and shape the incoming radio frequency signals received at the antenna in such a manner that the information containing component of the received energy can be delivered to the desired indicating of recording equipment. Used for receiving systems.
- UF *receiving systems*
- GS **receivers**
  - . linear receivers
  - . logarithmic receivers
  - . radar receivers
  - . radio receivers
  - . superheterodyne receivers
  - . transmitter receivers
  - . whistler recorders
  - . radiotelephones
  - . television receivers
- RT amplifiers
- ∞ detectors
- display devices
- duplexers
- electric filters
- instrument receivers
- ∞ receiving
- repeaters
- tanks (containers)
- teleprinters
- teletypewriters
- transmitters
- ∞ **receiving**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- UF *reception*
- RT acquisition
- collection
- delivery
- procurement
- radar reception
- radio reception
- receivers
- recognition
- signal reception
- television reception
- receiving systems*
- USE **receivers**
- receptacles (containers)*
- USE **containers**
- reception*
- USE **receiving**
- reception diversity**
- UF *space diversity*
- GS radio equipment
- . **reception diversity**
- RT fading
- radio antennas
- radio receivers
- radio reception
- Rayleigh fading
- signal fading
- receptors (physiology)**
- DEF Sensory nerve endings or organs in a living organism that is sensitive to physical or chemical stimuli.
- GS **receptors (physiology)**
  - . baroreceptors
  - . chemoreceptors
  - . gravireceptors
  - . otolith organs
  - . mechanoreceptors
  - . photoreceptors
  - . proprioceptors
  - . thermoreceptors
- RT sense organs
- sensitometry
- recesses**
- RT cavities
- crevasses
- ∞ hollow
- recession**
- RT ∞ depression
- economics
- recharging**
- DEF The restoring of discharged electric storage batteries to a charged condition by passing direct current through them in a direction opposite to that of the discharging current.
- RT charge efficiency
- reciprocal theorems**
- GS theorems
- . **reciprocal theorems**
- RT angles (geometry)
- geometry
- lines (geometry)
- points (mathematics)
- projective geometry
- reciprocating engines*
- USE **piston engines**
- reciprocation**
- RT cycles
- mechanical oscillators
- piston engines
- pistons
- reciprocity theorem**
- DEF Any theorem expressing reciprocal relations for the behavior of some physical system in which input and output can be interchanged without altering the response of the system to a given excitation.
- GS theorems
- . **reciprocity theorem**
- RT acoustic scattering
- electromagnetic fields
- electromagnetic scattering

- wave scattering
- recirculation*
  - USE **circulation**
- recirculative fluid flow**
  - GS fluid flow
    - . **recirculative fluid flow**
  - RT backward facing steps
    - boundary layer flow
    - boundary layer separation
    - reversed flow
    - turbulent flow
    - turbulent mixing
    - vortices
- reclamation**
  - GS **reclamation**
    - . materials recovery
    - . . gas recovery
    - . . nuclear fuel reprocessing
    - . . solvolysis
    - . . water reclamation
  - RT environmental cleanup
    - oil recovery
  - ∞ recovery
    - recycling
    - regeneration (engineering)
    - waste management
- recognition**
  - DEF The psychological process in which an observer so interprets the visual or auditory stimuli he receives from a distant object that he forms a correct conclusion as to the exact nature of that object or sound.
  - GS **recognition**
    - . pattern recognition
    - . . character recognition
    - . . graphology
    - . speech recognition
    - . target recognition
    - . timber identification
  - RT acquisition
    - consciousness
    - crop identification
    - identifying
    - IFF systems (identification)
  - ∞ interpretation
    - memory
  - ∞ receiving
    - remote sensing
- recoil atoms**
  - GS atoms
    - . **recoil atoms**
  - RT recoilings
- recoil ions**
  - GS ions
    - . **recoil ions**
  - RT atomic collisions
    - charge exchange
    - electron scattering
    - ion impact
    - ion production rates
    - ion scattering
    - ionic collisions
    - recoilings
- recoil protons**
  - GS particles
    - . charged particles
    - . . protons
    - . . . **recoil protons**
    - . elementary particles
    - . . fermions
    - . . . protons
    - . . . . **recoil protons**
  - RT baryons
    - recoilings
- recoilings**
  - RT collisions
    - particle motion
    - recoil atoms
    - recoil ions
- recoil protons
- recombinant DNA*
  - USE **deoxyribonucleic acid**
- recombination coefficient**
  - DEF A measure of the specific rate at which oppositely charged ions join to form neutral particles (a measure of ion recombination).
  - GS coefficients
    - . **recombination coefficient**
    - rates (per time)
    - . **recombination coefficient**
  - RT free electrons
    - ion recombination
    - ionized gases
- recombination reactions**
  - GS **recombination reactions**
    - . atomic recombination
    - . . oxygen recombination
    - . . electron recombination
    - . . radiative recombination
    - . . electron-ion recombination
    - . . radiative recombination
    - . hydrogen recombinations
    - . ion recombination
  - RT atomic collisions
    - capture effect
    - fertilization
    - Suhl effect
- recommendations**
  - GS **recommendations**
    - . suggestion
  - RT decision theory
    - general overviews
- recompression*
  - USE **compressing**
- reconfigurable hardware**
  - (added September 2001)
  - DEF Electronic circuit devices whose architectures can be programmatically modified to suit the application at hand.
  - GS **reconfigurable hardware**
    - . programmable logic devices
    - . . field-programmable gate arrays
    - . . evolvable hardware
  - RT chips (electronics)
    - ∞ hardware
      - integrated circuits
      - logic circuits
- reconnaissance**
  - GS **reconnaissance**
    - . aerial reconnaissance
    - . . Airborne Integrated Reconnaissance System
    - . photoreconnaissance
    - . . spectral reconnaissance
  - RT COSPAS
    - Earth resources
    - observation
    - patrols
    - photogeology
    - SarSat
    - searching
    - situational awareness
    - space observations (from Earth)
    - space surveillance (spaceborne)
    - surveillance
    - surveys
    - terrain analysis
- reconnaissance aircraft**
  - UF *Darkstar unmanned aerial vehicle*
  - GS **reconnaissance aircraft**
    - . A-9 aircraft
    - . Breguet 1150 aircraft
    - . Cessna L-19 aircraft
    - . HS-801 aircraft
    - . SR-71 aircraft
    - . TSR-2 aircraft
    - . U-2 aircraft
    - . Victor MK-1 aircraft
    - . weather reconnaissance aircraft
  - RT aerial reconnaissance
    - ∞ aircraft
- antisubmarine warfare aircraft
- Earth Resources Survey aircraft
- flying platforms
- jet aircraft
- light aircraft
- ∞ military aircraft
- ∞ military aviation
  - ∞ military helicopters
  - observation aircraft
  - pilotless aircraft
  - submersible aircraft
  - supersonic aircraft
  - unmanned aircraft systems
  - utility aircraft
  - V/STOL aircraft
  - Valiant aircraft
  - water takeoff and landing aircraft
  - YF-12 aircraft
- reconnaissance spacecraft**
  - GS military spacecraft
    - . **reconnaissance spacecraft**
    - . . Inspector satellite
    - . . . Midas satellites
    - . . . . Midas 2 satellite
    - . . . . Midas 3 satellite
    - . . . . Midas 4 satellite
    - . . . . Midas 5 satellite
    - . . . . Midas 6 satellite
    - . . . . Midas 7 satellite
    - . . photo reconnaissance spacecraft
    - . . . Samos
  - RT aerial reconnaissance
    - artificial satellites
    - manned orbital laboratories
    - manned spacecraft
    - unmanned spacecraft
- reconstruction**
  - GS **reconstruction**
    - . image reconstruction
    - . wave front reconstruction
  - RT construction
    - restoration
- ∞ **recorders**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT cable force recorders
    - data recorders
    - playbacks
    - recording instruments
    - registers (computers)
    - tape recorders
    - VLF emission recorders
- recording**
  - GS **recording**
    - . data recording
    - . data smoothing
    - . magnetic recording
    - . photographic recording
    - . prediction recording
  - RT playbacks
    - plotting
    - privacy
  - ∞ storage
- recording heads**
  - RT data recording
    - magnetic recording
    - magnetic tapes
    - recording instruments
    - tape recorders
    - video equipment
- recording instruments**
  - UF *emissographs*
    - pluviographs*
    - thermograms*
  - GS **recording instruments**
    - . bathythermographs
    - . cable force recorders
    - . flight recorders
    - . . flight load recorders
    - . force vector recorders
    - . mechanograms
    - . oscillographs
    - . plotters
    - . . x-y plotters

## records

- . pressure recorders
- . radiometeorographs
- . seismographs
- . . lunar seismographs
- . tape recorders
- . . video tape recorders
- . weather data recorders
- . whistler recorders
- RT aircraft instruments
- automatic control
- bubble technique
- control equipment
- counters
- data recorders
- electronic recording systems
- flight instruments
- graphs (charts)
- indicating instruments
- instrument receivers
- instrument transmitters
- ∞ instruments
- measuring instruments
- meteorological instruments
- ∞ pens
- photographic recording
- ∞ recorders
- recording heads
- sonograms
- sphygmography
- transducers
- VLF emission recorders

## records

- GS documents
- . **records**
- . . video disks
- RT case histories
- ∞ data
- data processing
- data recording
- documentation
- ∞ drawing
- format
- histories
- periodicals
- playbacks
- Presidential reports
- privacy
- records management
- reports
- supplements
- technical writing
- ∞ tests
- texts

## records management

(added August 1989)

- GS management
- . information management
- . . **records management**
- RT data management
- information resources management
- information systems
- management information systems
- records

## recoverability

- RT damage assessment
- ∞ properties
- ∞ recovery

## recoverable launch vehicles

- GS launch vehicles
- . **recoverable launch vehicles**
- RT booster recovery
- launch vehicle configurations
- multiengine vehicles
- ∞ recovery
- recovery parachutes
- reusable launch vehicles
- ∞ vehicles
- ∞ winged vehicles
- X-33 reusable launch vehicle
- X-34 reusable launch vehicle

*recoverable satellites*

USE **recoverable spacecraft**

## recoverable spacecraft

UF *recoverable satellites*

- GS reentry vehicles
- . **recoverable spacecraft**
- . . Apollo spacecraft
- . . . Apollo lunar experiment module
- . . Astro vehicle
- . . Gemini B spacecraft
- . . Gemini spacecraft
- . . . Gemini 2 spacecraft
- . . . Gemini (GT-1) spacecraft
- . . Mercury spacecraft
- . . . Aurora 7
- . . . Faith 7
- . . . Friendship 7
- . . . SIGMA 7
- . . reusable spacecraft
- . . . aerospace planes
- . . . . HOPE aerospace plane
- . . . . HOTOL launch vehicle
- . . . . VentureStar launch vehicle
- . . . . X-30 vehicle
- . . . . X-37 vehicle
- . . . . X-40A vehicle
- . . . MARS (Manned Reusable Spacecraft)
- . . . single stage to orbit vehicles
- . . . . Delta Clipper
- . . . . HOTOL launch vehicle
- . . . space shuttles
- . . . . Buran space shuttle
- . . . . Hermes manned spaceplane
- . . . . Space Shuttle orbiters
- . . . . . Atlantis (orbiter)
- . . . . . Challenger (Orbiter)
- . . . . . Columbia (Orbiter)
- . . . . . Discovery (Orbiter)
- . . . . . Endeavour (orbiter)
- . . . . . Enterprise (Orbiter)
- . . voskhod manned spacecraft
- . . Voskhod 1 spacecraft
- . . Voskhod 2 spacecraft
- . . Vostok spacecraft
- . . . Vostok 1 spacecraft
- . . . Vostok 2 spacecraft
- . . . Vostok 3 spacecraft
- . . . Vostok 4 spacecraft
- . . . Vostok 5 spacecraft
- . . . Vostok 6 spacecraft
- RT booster rocket engines
- boostglide vehicles
- expendable stages (spacecraft)
- hypersonic vehicles
- Inertial Upper Stage
- interim stages (spacecraft)
- lifting reentry vehicles
- maneuverable spacecraft
- manned spacecraft
- military spacecraft
- rendezvous spacecraft
- space capsules
- ∞ spacecraft
- spacecraft recovery
- unmanned spacecraft
- ∞ winged vehicles

## ∞ recovery

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT booster recovery
- gas recovery
- loop transfer recovery
- materials recovery
- nuclear fuel reprocessing
- oil recovery
- pressure recovery
- reclamation
- recoverability
- recoverable launch vehicles
- recovery parachutes
- retrieval
- reuse
- spacecraft recovery
- stress relaxation
- stress relieving
- visual discrimination

## recovery parachutes

- GS parachutes
- . **recovery parachutes**
- RT booster recovery

- Discoverer recovery capsules
- recoverable launch vehicles
- ∞ recovery
- ribbon parachutes
- spacecraft recovery

## recovery vehicles

- SN (EXCLUDES RECOVERABLE VEHICLES)
- GS **recovery vehicles**
- . Assured Crew Return Vehicle
- . X-38 crew return vehicle
- RT helicopters
- ∞ military vehicles
- trucks
- ∞ vehicles

## recovery zones

- RT downrange
- landing sites
- reentry range
- regions
- spacecraft recovery

## recreation

- RT morale
- parks
- relaxation (physiology)
- rest
- Starsite program
- tourism
- urban planning
- urban research

## recrystallization

- DEF In metals, the change from one crystal structure to another, as occurs on heating or cooling through a critical temperature. The formation of a new strain free grain structure from that existing in cold worked metal, usually accomplished by heating.
- GS crystallization
- . **recrystallization**
- RT annealing
- heat treatment
- laser annealing
- ∞ metallurgy
- nucleation
- polygonization
- ∞ separation

## rectangles

- GS geometry
- . Euclidean geometry
- . . polygons
- . . . tetragons
- . . . . **rectangles**
- RT rectangular planforms

## rectangular beams

- GS structural members
- . beams (supports)
- . . **rectangular beams**
- RT box beams

*rectangular coordinates*

USE **Cartesian coordinates**

*rectangular drainage*

USE **drainage patterns**

## rectangular panels

- GS panels
- . **rectangular panels**
- planforms
- . rectangular planforms
- . . **rectangular panels**
- RT strakes
- structural members
- wing panels

## rectangular planforms

- GS planforms
- . **rectangular planforms**
- . . rectangular panels
- . . . rectangular plates
- . . . rectangular wings
- RT rectangles
- wing planforms

## rectangular plates

- GS planforms

- . rectangular planforms
- . . **rectangular plates**
- structural members
- . plates (structural members)
- . . **rectangular plates**
- RT flat plates
- metal plates
- ∞ plates
- rectangular waveguides**
- GS waveguides
- . **rectangular waveguides**
- RT beam waveguides
- microwave filters
- rectangular wind tunnels**
- GS test facilities
- . wind tunnels
- . . **rectangular wind tunnels**
- RT subsonic wind tunnels
- rectangular wings**
- UF *straight wings*
- GS airfoils
- . wings
- . . unswept wings
- . . . **rectangular wings**
- planforms
- . rectangular planforms
- . . **rectangular wings**
- rectennas**
- DEF Devices that convert microwave energy into direct-current power by utilizing a number of small diodes each with its own diode rectifier. Used for rectifier antennas.
- UF *rectifier antennas*
- GS antennas
- . radio antennas
- . . microwave antennas
- . . . **rectennas**
- microwave equipment
- . microwave antennas
- . . **rectennas**
- radio equipment
- . radio antennas
- . . microwave antennas
- . . . **rectennas**
- RT satellite power transmission
- solar radiation
- spacetennas
- rectification**
- GS **rectification**
- . geometric rectification (imagery)
- RT ∞ condensation
- distillation
- purification
- refining
- rectifier antennas*
- USE **rectennas**
- rectifiers**
- SN (EXCLUDES PHOTOGRAPHIC RECTIFIER)
- DEF Static devices having an asymmetrical conduction characteristic which is used to convert attending current into direct current.
- GS **rectifiers**
- . avalanche diodes
- . . cryosar
- . crystal rectifiers
- . germanium diodes
- . ignitrons
- . thyratrons
- . thyristors
- . . silicon controlled rectifiers
- RT Barritt diodes
- current converters (AC to DC)
- diodes
- electron tubes
- ∞ energy sources
- form factors
- ITO (semiconductors)
- mercury arcs
- metal oxide semiconductors
- ∞ power supplies
- power supply circuits
- semiconductor devices
- solid state devices
- thin films
- rectum**
- GS anatomy
- . digestive system
- . . gastrointestinal system
- . . . intestines
- . . . . **rectum**
- recuperators*
- USE **regenerators**
- recursion formulas*
- USE **recursive functions**
- recursive filters*
- (added December 2002)
- USE **IIR filters**
- recursive functions**
- UF *recursion formulas*
- GS functions (mathematics)
- . **recursive functions**
- RT FIR filters
- IIR filters
- LISP (programming language)
- strange attractors
- recycling**
- RT economy
- extraction
- materials recovery
- nuclear fuel reprocessing
- ∞ processing
- reclamation
- refining
- resources
- solvolysis
- spent fuels
- waste management
- red arcs**
- GS atmospheric radiation
- . auroras
- . . auroral arcs
- . . . **red arcs**
- RT ∞ arcs
- auroral ionization
- red blood cells*
- USE **erythrocytes**
- red dwarf stars**
- DEF Red stars of low luminosity, so designated by E. Hertzsprung. Red Dwarf stars are commonly those main sequence stars fainter than an absolute magnitude of plus 1, and are the faintest and coolest of the dwarfs.
- GS celestial bodies
- . stars
- . . main sequence stars
- . . . dwarf stars
- . . . . **red dwarf stars**
- RT hot stars
- late stars
- massive compact halo objects
- stellar luminosity
- stellar magnitude
- subdwarf stars
- supernova remnants
- white dwarf stars
- red giant stars**
- DEF Stars whose evolution has progressed to the point where hydrogen core burning has been completed, the helium core has become denser and hotter than originally, and the envelope has expanded to perhaps 100 times its initial size.
- GS celestial bodies
- . stars
- . . giant stars
- . . . **red giant stars**
- . . . . carbon stars
- RT asymptotic giant branch stars
- late stars
- M stars
- Mira variables
- S stars
- stellar evolution
- stellar luminosity
- Red Sea**
- GS seas
- . **Red Sea**
- RT Africa
- Asia
- red shift**
- DEF In astronomy, the displacement of observed spectral lines toward the longer wavelengths of the red end of the spectrum.
- RT blue shift
- cosmology
- Doppler effect
- Doppler-Fizeau effect
- galaxies
- Hubble constant
- Hubble diagram
- irregular galaxies
- radial velocity
- red sprites*
- (added January 2000)
- USE **sprites (atmospheric physics)**
- red tide**
- RT fishes
- marine environments
- microorganisms
- oceanography
- plankton
- sea water
- toxicology
- Redeye missile**
- GS missiles
- . antiaircraft missiles
- . . **Redeye missile**
- . surface to air missiles
- . . **Redeye missile**
- RT solid propellant rocket engines
- Redox cells**
- DEF Cells for converting the energy of reactants to electrical energy; an intermediate reductant in the form of liquid electrolyte reacts at the anode in a conventional manner and is regenerated by reaction with a primary fuel.
- GS electrochemical cells
- . electric batteries
- . . **Redox cells**
- RT electrochemistry
- electrolytes
- energy conversion efficiency
- energy storage
- reduced gravity*
- USE **microgravity**
- reduced instruction set computing*
- USE **RISC processors**
- reduced order filters**
- GS linear filters
- . **reduced order filters**
- RT electric filters
- ∞ filters
- Kalman filters
- navigation aids
- ∞ **reduction**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- UF *decrementing*
- diminution*
- shortening*
- RT attenuation
- cleaning
- comminution
- contraction
- damping
- data reduction
- deceleration
- decontamination
- demagnetization
- deoxygenation
- depletion
- depolarization

## reduction (chemistry)

dilution  
dimming  
dispersing  
dissipation  
drag reduction  
elimination  
friction reduction  
hydrogenolysis  
∞ inhibition  
iodimetry  
leakage  
metal working  
noise reduction  
optimization  
pressure reduction  
prevention  
purification  
reduction (chemistry)  
refining  
relaxation (mechanics)  
removal  
retarding  
shrinkage  
sidelobe reduction  
spin reduction  
stopping  
tapering

### reduction (chemistry)

GS chemical reactions  
. **reduction (chemistry)**  
. . deoxidizing  
. . hydrogenation  
RT ∞ chemistry  
dehydrogenation  
electrodeposition  
electrolysis  
metal powder  
oxidation  
oxidation-reduction reactions  
purification  
∞ reduction  
roasting  
smelting  
trichloroethylene

### reduction (mathematics)

USE **optimization**

### redundancy

DEF The existence of more than one means of accomplishing a given task, where all means must fail before there is an overall failure of the system.

RT assurance  
communication theory  
computer program integrity  
correction  
error detection codes  
information theory  
reliability

### redundancy encoding

GS coding  
. **redundancy encoding**  
RT concatenated codes  
data transmission  
error correcting codes  
error correcting devices  
error detection codes  
Reed-Solomon codes  
repetition  
signal encoding

### redundant components

UF *redundant structures*  
RT backups  
∞ components  
reliability  
spare parts  
∞ structures

### redundant structures

USE **redundant components**

### reeds (plants)

GS plants (botany)  
. grasses

### . . reeds (plants)

### Reed-Solomon codes

(added June 1992)  
UF *RS codes*  
GS error correcting codes  
. **Reed-Solomon codes**  
RT bit error rate  
∞ codes  
coding  
concatenated codes  
decoders  
redundancy encoding  
signal encoding

### reefs

DEF Chains of rocks, sand ridges, or coral at or near the surface of water.  
GS landforms  
. barriers (landforms)  
. . **reefs**  
RT atolls  
bars (landforms)  
coral reefs  
island arcs  
islands  
oceanography  
rocks  
sands  
shallow water  
∞ shelves  
shoals

### reels

RT cables (ropes)  
∞ containers  
magnetic tapes  
spools  
tethered balloons  
tethered satellites  
tethering

### reentry

DEF The event occurring when a spacecraft or other object comes back into the sensible atmosphere after going to higher altitudes; the action involved in this event.

GS atmospheric entry  
. **reentry**  
. . hyperbolic reentry  
. . hypersonic reentry  
. . . uncontrolled reentry (spacecraft)  
. . manned reentry  
. . spacecraft reentry  
. . . uncontrolled reentry (spacecraft)

RT ablation  
aerodynamic heating  
aerodynamic stability  
aerodynamics  
aerothermodynamics  
descent  
descent trajectories  
∞ entry  
flight paths  
impact prediction  
lifting reentry vehicles  
low observable reentry vehicles  
missiles  
∞ rockets  
space flight  
terminal guidance

### reentry bodies

USE **reentry vehicles**

### reentry breakup

USE **spacecraft breakup**

### reentry communication

GS telecommunication  
. space communication  
. . spacecraft communication  
. . . **reentry communication**  
RT blackout (propagation)  
manned reentry  
plasma sheaths  
radio communication

voice communication

### reentry decoys

GS countermeasures  
. **reentry decoys**  
decoys  
. **reentry decoys**  
reentry vehicles  
. **reentry decoys**  
RT ballistic missile decoys  
missile defense

### reentry effects

RT ablation  
aerodynamic heating  
blackout (propagation)  
∞ effects  
hypersonic reentry  
plasma sheaths  
spacecraft breakup  
temperature effects

### reentry gliders

USE **lifting reentry vehicles**

### reentry guidance

GS guidance (motion)  
. **reentry guidance**  
RT automatic control  
descent trajectories  
inertial guidance  
manual control  
satellite guidance  
spacecraft guidance  
terminal guidance

### reentry physics

RT ablation  
aerothermochemistry  
aerothermodynamics  
hypersonic reentry  
low observable reentry vehicles  
∞ physics  
plasma sheaths  
∞ science

### reentry range

GS distance  
. **reentry range**  
RT missile ranges  
recovery zones

### reentry shielding

GS shielding  
. heat shielding  
. . **reentry shielding**  
RT ablation  
ablative nose cones  
aerodynamic heating  
aerothermochemistry  
heat sinks  
∞ insulated structures  
Ludox (trademark)  
nose cones  
reusable heat shielding  
spacecraft shielding  
thermal control coatings  
thermal insulation  
thermal protection

### reentry trajectories

DEF Those parts of rocket trajectories that begin at reentry and end at target or at the surface.

GS trajectories  
. descent trajectories  
. . **reentry trajectories**  
RT circumlunar trajectories  
flight mechanics  
hyperbolic reentry  
missile trajectories  
moon-Earth trajectories  
spacecraft trajectories  
terminal guidance

### reentry vehicles

DEF Any payload carrying vehicles designed to leave the sensible atmosphere and then return through it to Earth. Used for reentry bodies.

UF *reentry bodies*  
 GS **reentry vehicles**  
 . boostglide vehicles  
 . . X-20 aircraft  
 . low observable reentry vehicles  
 . maneuverable reentry bodies  
 . . lifting reentry vehicles  
 . . . FDL-5 reentry vehicle  
 . . . HL-10 reentry vehicle  
 . . . HLD-35 reentry vehicle  
 . . . Janus spacecraft  
 . . . M-2 lifting body  
 . . . . M-2F2 lifting body  
 . . . X-20 aircraft  
 . . . X-24 aircraft  
 . Mark 1 reentry body  
 . Mark 2 reentry body  
 . Mark 3 reentry body  
 . Mark 4 reentry body  
 . Mark 5 reentry body  
 . Mark 6 reentry body  
 . Mark 11 reentry body  
 . Mark 12 reentry body  
 . Mark 17 reentry body  
 . recoverable spacecraft  
 . Apollo spacecraft  
 . . Apollo lunar experiment module  
 . . Astro vehicle  
 . . Gemini B spacecraft  
 . . Gemini spacecraft  
 . . . Gemini 2 spacecraft  
 . . . Gemini (GT-1) spacecraft  
 . . Mercury spacecraft  
 . . . Aurora 7  
 . . . Faith 7  
 . . . Friendship 7  
 . . . SIGMA 7  
 . reusable spacecraft  
 . . aerospace planes  
 . . . . HOPE aerospace plane  
 . . . . HOTOL launch vehicle  
 . . . . VentureStar launch vehicle  
 . . . . X-30 vehicle  
 . . . . X-37 vehicle  
 . . . . X-40A vehicle  
 . . MARS (Manned Reusable  
 Spacecraft)  
 . . single stage to orbit vehicles  
 . . . . Delta Clipper  
 . . . . HOTOL launch vehicle  
 . . . space shuttles  
 . . . . Buran space shuttle  
 . . . . Hermes manned spaceplane  
 . . . . Space Shuttle orbiters  
 . . . . . Atlantis (orbiter)  
 . . . . . Challenger (Orbiter)  
 . . . . . Columbia (Orbiter)  
 . . . . . Discovery (Orbiter)  
 . . . . . Endeavour (orbiter)  
 . . . . . Enterprise (Orbiter)  
 . . voskhod manned spacecraft  
 . . Voskhod 1 spacecraft  
 . . Voskhod 2 spacecraft  
 . . Vostok spacecraft  
 . . . Vostok 1 spacecraft  
 . . . Vostok 2 spacecraft  
 . . . Vostok 3 spacecraft  
 . . . Vostok 4 spacecraft  
 . . . Vostok 5 spacecraft  
 . . . Vostok 6 spacecraft  
 . reentry decoys  
 . Trailblazer 1 reentry vehicle  
 . Trailblazer 2 reentry vehicle  
 . X-17 reentry vehicle  
 RT ablative nose cones  
 aeroshells  
 aerothermochemistry  
 Athena rocket vehicle  
 ∞ ballistic vehicles  
 bluff bodies  
 ∞ bodies  
 ferry spacecraft  
 ∞ flight vehicles  
 hypersonic vehicles  
 ∞ insulated structures  
 landing modules  
 lifting bodies  
 maneuverable spacecraft  
 missiles

nose cones  
 pyramidal bodies  
 ∞ rockets  
 space capsules  
 ∞ spacecraft  
 spacecraft configurations  
 terminal guidance  
 test vehicles  
 ∞ vehicles  
 ∞ winged vehicles  
**reference atmospheres**  
 UF *standard atmospheres*  
 GS models  
 . atmospheric models  
 . . **reference atmospheres**  
 standards  
 . **reference atmospheres**  
**reference stars**  
 GS celestial bodies  
 . stars  
 . . **reference stars**  
 RT astronomical coordinates  
 astronomical photography  
 celestial navigation  
 laser guide stars  
 navigation aids  
 space navigation  
 ∞ **reference systems**  
 SN (USE OF A MORE SPECIFIC TERM IS  
 RECOMMENDED--CONSULT THE TERMS  
 LISTED BELOW)  
 RT bibliographies  
 celestial reference systems  
 coordinates  
 documentation  
 indexes (documentation)  
 inertial reference systems  
 libraries  
 spherical coordinates  
 ∞ systems  
 Wiswesser notations  
*references (standards)*  
 USE **standards**  
**refilling**  
 GS filling  
 . **refilling**  
 RT ∞ loading  
 replenishment  
**refining**  
 GS **refining**  
 . electrorefining  
 . electroslag refining  
 RT alkylation  
 beneficiation  
 chemical fractionation  
 clean fuels  
 cleaning  
 ∞ conversion  
 crystallization  
 desulfurizing  
 dewaxing  
 distillation  
 drop transfer  
 energy policy  
 enrichment  
 extraction  
 fractionation  
 hydrogenation  
 hydrometallurgy  
 isomerization  
 materials recovery  
 polymerization  
 ∞ processing  
 purification  
 pyrometallurgy  
 rectification  
 recycling  
 ∞ reduction  
 ∞ separation  
 smelting  
 sublimation  
 upgrading

zone melting  
**reflectance**  
 DEF The ratio of the radiant flux reflected by a body to that incident upon it. Used for reflection coefficient and reflectivity.  
 UF *reflection coefficient*  
*reflectivity*  
 GS electromagnetic properties  
 . optical properties  
 . . **reflectance**  
 . . . bidirectional reflectance  
 . . . spectral reflectance  
 RT absorbance  
 albedo  
 attenuation coefficients  
 birefringence  
 bistatic reflectivity  
 brightness  
 coarseness  
 cosmic ray albedo  
 Earth albedo  
 flow coefficients  
 geometrical theory of diffraction  
 luster  
 MISR (radiometry)  
 optical measurement  
 optical reflection  
 photometry  
 ray tracing  
 reflection  
 reflectometers  
 surface properties  
 surface roughness effects  
 thermochromic coatings  
 transmittance  
 vegetative index  
*reflected radiation*  
 USE **reflected waves**  
*reflected rays*  
 USE **reflected waves**  
**reflected waves**  
 DEF Shock waves, expansion waves, or compression waves reflected by another wave incident upon a wall or other boundary. In electronics, radio waves reflected from a surface or object. Used for reflected radiation and reflected rays.  
 UF *reflected radiation*  
*reflected rays*  
 RT corpuscular radiation  
 elastic waves  
 electromagnetic radiation  
 evanescent waves  
 incident radiation  
 optical reflection  
 photon beams  
 ∞ radiation  
 refracted waves  
 retroreflection  
 wave reflection  
**reflecting telescopes**  
 DEF Telescopes which collect light by means of concave mirrors.  
 GS telescopes  
 . **reflecting telescopes**  
 . . Large Deployable Reflector  
 . . Starsat telescope  
 RT Cassegrain optics  
 honeycomb mirrors  
 mirrors  
 optical equipment  
 optical measuring instruments  
 paraboloid mirrors  
 reflectors  
 Schmidt telescopes  
 segmented mirrors  
 spectroscopic telescopes  
 stratoscope telescopes  
**reflection**  
 DEF The process whereby a surface of discontinuity turns back a portion of the incident radiation into the medium through which the radiation approached.  
 GS **reflection**

## reflection nebulae

- . infrared reflection
- . optical reflection
- . retroreflection
- . signal reflection
- . specular reflection
- . spread reflection
- . ultraviolet reflection
- . wave reflection
- . . Mach reflection

RT bidirectional reflectance

- Brewster angle
- deflection
- diffusion
- echelette gratings
- echelle gratings
- electromagnetic absorption
- electromagnetic radiation
- impingement
- Lambert surface
- light (visible radiation)
- ∞ optics
- reflectance
- refraction
- scattering
- transmission
- zero sound

*reflection coefficient*  
USE **reflectance**

### reflection nebulae

DEF Any celestial body having a hazy cloudy appearance whose brightness results from the scattering by dust particles of light from nearby stars.

GS celestial bodies

- . nebulae
- . . **reflection nebulae**

RT cosmic dust

- interstellar matter
- light scattering

*reflectivity*  
USE **reflectance**

### reflectometers

DEF Instruments for measuring reflectance.

GS measuring instruments

- . optical measuring instruments
- . . **reflectometers**
- . . . microwave reflectometers
- optical equipment
- . optical measuring instruments
- . . **reflectometers**
- . . . microwave reflectometers

RT comparators

- directors (antenna elements)
- optical measurement
- photometers
- reactor cores
- reflectance
- reflector antennas
- Schelkunoff principle
- two reflector antennas
- ultraviolet reflection

### reflector antennas

DEF Antennas consisting of one or more reflecting surfaces and a radiating (receiving) feed system.

GS antennas

- . directional antennas
- . . **reflector antennas**
- . . . parabolic antennas
- . . . two reflector antennas

RT antenna feeds

- antenna radiation patterns
- Cassegrain antennas
- microwave antennas
- multibeam antennas
- parabolic reflectors
- radar antennas
- radar corner reflectors
- radar reflectors
- radio antennas
- reflectometers
- reflectors

subreflectors

*reflector satellites*  
USE **passive satellites**

### reflectors

GS **reflectors**

- . Fresnel reflectors
- . parabolic reflectors
- . . paraboloid mirrors
- . radar reflectors
- . . radar corner reflectors
- . retroreflectors
- . solar reflectors
- . . solar collectors
- . . solettas
- . Bragg reflectors
- . wiggler magnets

RT antennas

- attenuators
- baffles
- ceilings (architecture)
- deflectors
- directors (antenna elements)
- etalons
- heliostats
- Large Deployable Reflector
- mirrors
- parasitic elements (antennas)
- plasma core reactors
- radiation shielding
- reactor cores
- reflecting telescopes
- reflector antennas
- Schelkunoff principle
- subreflectors
- telescopes
- two reflector antennas

### reflexes

GS **reflexes**

- . conditioned reflexes
- . respiratory reflexes
- . . cough
- . . Hering-Breuer reflex
- . . sneezing
- . baroreflexes
- . vestibular nystagmus
- . . carotid sinus reflex

RT deconditioning

- reaction time
- vasoconstriction
- vasodilation

### reforestation

DEF The reestablishment of a tree crop on forest land.

GS management

- . resources management
- . . forest management
- . . . **reforestation**

RT forests

- timber inventory

*refracted radiation*  
USE **refracted waves**

*refracted rays*  
USE **refracted waves**

### refracted waves

DEF Waves that have had their direction of motion changed by refraction. Used for refracted radiation and refracted rays.

UF *refracted radiation*

*refracted rays*

RT corpuscular radiation

- eikonal equation
- elastic waves
- electromagnetic radiation
- incident radiation
- photon beams
- reflected waves
- refraction
- ∞ waves

### refracting telescopes

DEF Telescopes which collect light by means of a lens or system of lenses.

GS telescopes

. **refracting telescopes**

RT lenses

- optical equipment
- optical measuring instruments
- spectroscopic telescopes
- stratoscope telescopes

### refraction

DEF The process in which the direction of energy propagation is changed as the result of a change within the propagating medium, or as the energy passes through the interface representing a density discontinuity between the two media. In the first instance, the rays undergo a smooth bending over a finite distance. In the second case, the index of refraction changes through an interfacial layer that is thin compared to the wavelength of the radiation; thus, the refraction is abrupt, essentially discontinuous.

GS **refraction**

- . atmospheric refraction
- . . radio wave refraction
- . birefringence
- . . Kerr electrooptical effect

RT asphericity

- astigmatism

∞ conduction

- deflection
- diffraction
- distortion
- divergence
- Huygens principle
- isochromatics
- lenses
- light (visible radiation)
- photoelasticity
- prisms
- reflection
- refracted waves
- refractivity
- sinking
- Snells law
- transmission
- Voigt effect
- wave dispersion
- wave propagation

*refractive index*  
USE **refractivity**

### refractivity

UF *refractive index*

GS electromagnetic properties

- . optical properties
- . . **refractivity**
- . . . photorefractivity

RT atmospheric refraction

- birefringence
- birefringent coatings
- birefringent filters
- Brewster angle
- gradient index optics
- isotropism
- light (visible radiation)
- opacity
- optical thickness
- polarization (waves)
- ratios
- refraction
- reflectometers
- Snells law
- underwater optics

### reflectometers

DEF Instruments for measuring the index of refraction of a liquid, gas, or solid.

GS measuring instruments

- . optical measuring instruments
- . . **reflectometers**
- optical equipment
- . optical measuring instruments
- . . **reflectometers**

RT goniometers

- optical measurement
- refractivity

### refractories

GS refractory materials

- . **refractories**

RT ceramics

cermets  
 combustion chambers  
 forsterite  
 furnaces  
 hearths  
 mortars (material)  
 refractory coatings  
 rocket engines  
 rocket linings  
 thermal insulation  
 turbines

**refractory coatings**

DEF Pyrolytic materials used for coating other materials exposed to high temperatures.

GS coatings  
 . protective coatings  
 . . **refractory coatings**  
 RT ceramics  
 pyrolytic materials  
 refractories  
 thermal insulation

**refractory materials**

UF *high melting compounds*  
*high temperature materials*  
*pyrographalloy*

GS **refractory materials**  
 . Ludox (trademark)  
 . porcelain  
 . refractories  
 . refractory metal alloys  
 . . molybdenum alloys  
 . . . Rene 41  
 . . . Rene 63  
 . . . Rene 77  
 . . . Rene 95  
 . . niobium alloys  
 . . osmium alloys  
 . . rhenium alloys  
 . . tantalum alloys  
 . . tungsten alloys  
 . refractory metals  
 . . chromium  
 . . . chromium isotopes  
 . . iridium  
 . . . iridium isotopes  
 . . molybdenum  
 . . niobium  
 . . . niobium isotopes  
 . . . . niobium 95  
 . . osmium  
 . . . osmium isotopes  
 . . rhenium  
 . . . rhenium isotopes  
 . . tantalum  
 . . . tantalum isotopes  
 . . tungsten  
 . . . tungsten isotopes

RT ablative materials  
 carbides  
 Carborundum (trademark)  
 ceramics  
 cermets  
 ∞ chemical compounds  
 clays  
 high temperature research  
 ∞ inorganic materials  
 ∞ materials  
 ∞ metal compounds  
 nonflammable materials  
 nozzle walls  
 pyrolytic materials  
 Scotchlite (trademark)  
 sialon

**refractory metal alloys**

GS alloys  
 . heat resistant alloys  
 . . **refractory metal alloys**  
 . . . molybdenum alloys  
 . . . . Rene 41  
 . . . . Rene 63  
 . . . . Rene 77  
 . . . . Rene 95  
 . . . niobium alloys  
 . . . osmium alloys  
 . . . rhenium alloys  
 . . . tantalum alloys  
 . . . tungsten alloys

refractory materials  
 . **refractory metal alloys**  
 . . molybdenum alloys  
 . . . Rene 41  
 . . . Rene 63  
 . . . Rene 77  
 . . . Rene 95  
 . . niobium alloys  
 . . osmium alloys  
 . . rhenium alloys  
 . . tantalum alloys  
 . . tungsten alloys

**refractory metals**

DEF Usually alloys of high-melting point, hard-to-work metals, but can also refer to certain unalloyed elements.

GS metals  
 . **refractory metals**  
 . . chromium  
 . . . chromium isotopes  
 . . iridium  
 . . . iridium isotopes  
 . . molybdenum  
 . . niobium  
 . . . niobium isotopes  
 . . . . niobium 95  
 . . osmium  
 . . . osmium isotopes  
 . . rhenium  
 . . . rhenium isotopes  
 . . tantalum  
 . . . tantalum isotopes  
 . . tungsten  
 . . . tungsten isotopes  
 refractory materials  
 . **refractory metals**  
 . . chromium  
 . . . chromium isotopes  
 . . iridium  
 . . . iridium isotopes  
 . . molybdenum  
 . . niobium  
 . . . niobium isotopes  
 . . . . niobium 95  
 . . osmium  
 . . . osmium isotopes  
 . . rhenium  
 . . . rhenium isotopes  
 . . tantalum  
 . . . tantalum isotopes  
 . . tungsten  
 . . . tungsten isotopes  
 RT heat resistant alloys  
 transition metals

**refractory period**

RT reaction time  
 ∞ relaxation  
 responses  
 time lag

*Refrasil (trademark)*

USE **fibers**  
**silicon dioxide**

**refrigerants**

RT absorbers (materials)  
 absorption cooling  
 air conditioning  
 ammonia  
 brines  
 coolants  
 cooling systems  
 fluorohydrocarbons  
 freon  
 ice  
 refrigerating  
 refrigerating machinery  
 refrigerators  
 solid nitrogen

**refrigerating**

RT air conditioning  
 air cooling  
 cold traps  
 condensing  
 coolers  
 cooling  
 cooling systems

cryogenic cooling  
 cryogenic equipment  
 cryogenics  
 defrosting  
 dehumidification  
 freezing  
 freon  
 frozen foods  
 humidity  
 low temperature  
 magnetic cooling  
 preserving  
 refrigerants  
 refrigerators  
 temperature  
 temperature control  
 temperature distribution  
 thermoacoustic refrigerators  
 thermoelectric cooling  
 ventilation

**refrigerating machinery**

GS **refrigerating machinery**  
 . refrigerators  
 . . thermoacoustic refrigerators  
 RT absorbers (equipment)  
 air conditioning  
 air conditioning equipment  
 blowers  
 compressors  
 condensers (liquefiers)  
 coolers  
 cooling systems  
 cryogenic equipment  
 evaporators  
 heat pumps  
 ∞ machinery  
 refrigerants  
 temperature control  
 thermoelectric cooling

**refrigerators**

GS refrigerating machinery  
 . **refrigerators**  
 . . thermoacoustic refrigerators  
 RT coolers  
 defrosting  
 refrigerants  
 refrigerating

**Refsat**

DEF A proposed satellite that broadcasts navigation aiding signals to low cost user terminals which employ the constellation of 24 NavStar Global Positioning System (GPS) satellites for position determination.

GS artificial satellites  
 . navigation satellites  
 . . **Refsat**  
 RT NAVSTAR satellites  
 synchronous satellites

**refueling**

UF *fueling*  
 GS **refueling**  
 . air to air refueling  
 RT aircraft hazards  
 flight operations  
 fuel consumption  
 fuel contamination  
 fuel control  
 fuel systems  
 ground support equipment  
 preflight operations  
 propellant transfer  
 replenishment  
 retractable equipment

**∞ regeneration**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT regeneration (engineering)  
 regeneration (physiology)

**regeneration (engineering)**

UF *regenerative cycles*  
 RT ∞ generation  
 positive feedback  
 reclamation



## regeneration (physiology)

∞ regeneration

### regeneration (physiology)

UF *bioregeneration*

RT physiology

∞ regeneration

### regenerative cooling

DEF The cooling of a part of an engine by the fuel or propellant being delivered to the combustion chamber; specifically, the cooling of a rocket engine combustion chamber or nozzle by circulating the fuel or oxidizer, or both, around the part to be cooled.

GS cooling

. **regenerative cooling**

RT heat exchangers

precooling

regenerators

### regenerative cycles

USE **regeneration (engineering)**

### regenerative feedback

USE **positive feedback**

### regenerative fuel cells

GS electric generators

. direct power generators

. . fuel cells

. . . **regenerative fuel cells**

electrochemical cells

. fuel cells

. . **regenerative fuel cells**

RT biochemical fuel cells

phosphoric acid fuel cells

storage batteries

### regenerators

DEF Devices used in a thermodynamic process for capturing and returning to the process heat that would otherwise be lost. Used for recuperators.

UF *recuperators*

GS **regenerators**

. thermosiphons

RT energy storage

heat exchangers

heat sinks

regenerative cooling

tube heat exchangers

### Regge poles

RT angular momentum

∞ poles

Pomeranchuk theorem

pomerons

scattering cross sections

### regimes

RT communities

culture (social sciences)

environments

governments

nations

politics

### regional planning

GS planning

. **regional planning**

. . urban planning

RT conservation

farmlands

forest management

forests

harbors

highways

industrial areas

lakes

land management

megalopolises

parks

residential areas

rural areas

rural land use

St Louis-Kansas City Corridor (MO)

suburban areas

urban development

urban transportation

### regions

UF *zones*

GS **regions**

. auroral zones

. Brillouin zones

. Central America

. Central Atlantic Region (US)

. Central Europe

. D region

. E region

. . E-1 layer

. . E-2 layer

. . sporadic E layer

. equatorial regions

. F region

. . F 1 region

. . F 2 region

. Fresnel region

. Great Basin (US)

. Great Plains Corridor (North

America)

. Gutenberg zone

. habitats

. lumbar region

. M region

. Middle East

. New England (US)

. null zones

. Pacific Northwest (US)

. Panama Canal Zone

. pelagic zone

. polar regions

. . Antarctic regions

. . . McMurdo sound

. . . Ross ice shelf

. . Arctic regions

. . . subarctic regions

. remote regions

. . Antarctic regions

. . . McMurdo sound

. . . Ross ice shelf

. . Arctic regions

. . . subarctic regions

. Sand Hills Region (GA-NC-SC)

. Sand Hills Region (NE)

. sciatic region

. Southeast Asia

. Southern California

. Southern Yemen

. temperate regions

. tropical regions

. . Amazon region (South America)

. . intertropical convergent zones

RT asteroid belts

∞ belts

boundaries

Earth ionosphere

∞ layers

recovery zones

∞ sectors

sites

∞ **registers**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT registers (air circulation)

registers (computers)

### registers (air circulation)

RT cooling systems

∞ registers

### registers (computers)

DEF Devices capable of retaining information, often that contained in a small subset (e.g., one word) of the aggregate information in a digital computer.

GS computer components

. computer storage devices

. . **registers (computers)**

. . . accumulators (computers)

RT central processing units

∞ recorders

∞ registers

shift registers

### regolith

DEF The layer rock or blanket or unconsolidated rocky debris of any thickness that overlies bedrock and forms the surface of the land.

GS rocks

. **regolith**

RT basalt

bedrock

breccia

carbonaceous rocks

coal

core-mantle boundary

Earth mantle

Earth resources

enstatite

geology

igneous rocks

lava

lithology

lunar geology

lunar mantle

lunar rocks

magma

olivine

peridotite

pyroxenes

rock intrusions

selenology

stratigraphy

### regression (statistics)

USE **regression analysis**

### regression analysis

DEF The statistical counterpart or analog of the functional expression, in ordinary mathematics, of one variable in terms of others.

UF *regression (statistics)*

GS statistical analysis

. variance (statistics)

. . multivariate statistical analysis

. . . **regression analysis**

. . . . regression coefficients

RT autoregressive moving average

autoregressive processes

clumps

correlation

covariance

experiment design

factor analysis

forecasting

least squares method

quality control

significance

statistical tests

variability

### regression coefficients

GS coefficients

. **regression coefficients**

statistical analysis

. variance (statistics)

. . multivariate statistical analysis

. . . regression analysis

. . . . **regression coefficients**

RT correlation

forecasting

mathematical models

quality control

### regularity

RT continuity (mathematics)

convergence

irregularities

∞ normalizing

∞ patterns

periodic variations

physiology

∞ properties

trend analysis

### regulation

USE **control**

### regulations

RT air law

allowances

∞ control

- copyrights
  - crime
  - law (jurisprudence)
  - liabilities
  - licensing
  - patent policy
  - penalties
  - police
  - policies
  - procurement policy
  - prohibition
  - rules
- regulators**
- SN (LIMITED TO DEVICES)
  - GS control equipment
    - . **regulators**
    - .. automatic control valves
    - ... pressure regulators
    - ... relief valves
    - .. cryostats
    - .. current regulators
    - .. flow regulators
    - .. fuel flow regulators
    - .. oxygen regulators
    - .. speed regulators
    - .. thermostats
    - .. voltage regulators
  - RT actuators
    - automatic control
  - ∞ control
    - controllers
    - gibberellins
    - speed control
- regulatory mechanisms (biology)**
- SN (RESTRICTED TO THE REGULATION OF PHYSIOLOGICAL AND PHYSIOCHEMICAL PROCESSES--EXCLUDES ECOLOGICAL, GENETIC, OR BIOTECHNOLOGICAL REGULATION)
  - DEF Specific processes by which living organisms control the rates of biochemical and physiological reactions involved in processes such as metabolism and cellular differentiation.
  - RT biocontrol systems
    - calmodulin
  - ∞ control
    - hormones
    - thermoregulation
- Regulus missile**
- GS missiles
    - . surface to surface missiles
    - .. **Regulus missile**
  - RT solid propellant rocket engines
    - turbojet engines
- reheating*
- USE **heating**
- reignition*
- USE **ignition**
- reinforced plastics**
- DEF Plastics with some strength properties greatly superior to those of the base resin, resulting from the presence of high-strength fillers imbedded in the composition. Note: The reinforcing fillers are usually fibers, fabrics, or mats made of fibers. The plastic laminates are the most common and strongest.
- GS composite materials
    - . polymer matrix composites
    - .. **reinforced plastics**
    - ... carbon fiber reinforced plastics
    - ... carbon-phenolic composites
    - ... glass fiber reinforced plastics
    - ... micarta
    - plastics
    - . **reinforced plastics**
    - .. carbon fiber reinforced plastics
    - ... carbon-phenolic composites
    - ... glass fiber reinforced plastics
    - .. micarta
  - RT aircraft survivability
    - aramid fiber composites
    - aramid fibers
    - boron fibers
    - boron reinforced materials
    - fiber composites
- graphite-epoxy composites
  - hybrid composites
  - laminates
  - reinforcement (structures)
  - thermosetting resins
- reinforced plates**
- GS structural members
    - . plates (structural members)
    - .. **reinforced plates**
  - RT anisotropic plates
    - corrugated plates
    - laminates
    - plastic plates
    - reinforcement (structures)
- reinforced shells**
- GS shells (structural forms)
    - . **reinforced shells**
  - RT anisotropic shells
    - corrugated shells
    - cylindrical shells
    - fluid filled shells
    - hemispherical shells
    - liquid filled shells
    - metal shells
    - orthotropic shells
    - plastic shells
    - reinforcement (structures)
    - reinforcement rings
    - shell stability
    - spherical shells
    - thin walled shells
    - toroidal shells
    - wind tunnel walls
- ∞ **reinforcement**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT reinforcement (psychology)
  - reinforcement (structures)
- reinforcement (psychology)**
- reinforcement (psychology)**
- GS . reward (psychology)
  - RT learning
    - motivation
  - ∞ reinforcement
    - self stimulation
- reinforcement (structures)**
- RT bulkheads
    - composite materials
    - fillers
    - longerons
    - reinforced plastics
    - reinforced plates
    - reinforced shells
  - ∞ reinforcement
    - reinforcement rings
    - ribs (supports)
    - rigid structures
    - ring structures
    - stiffening
    - strakes
    - stringers
    - structural members
    - structural stability
    - structural strain
    - supports
    - thick walls
    - wire
    - wire cloth
- reinforcement rings**
- GS ring structures
    - . **reinforcement rings**
  - RT reinforced shells
    - reinforcement (structures)
    - ribs (supports)
  - ∞ rings
- reinforcing fibers**
- GS fibers
    - . **reinforcing fibers**
    - .. aramid fibers
    - ... Kevlar (trademark)
    - .. boron fibers
    - .. carbon fibers
  - RT boron reinforced materials
- braided composites
  - carbon fiber reinforced plastics
  - carbon-carbon composites
  - ceramic fibers
  - ceramic matrix composites
  - composite materials
  - Dacron (trademark)
  - debonding (materials)
  - fiber composites
  - fiber orientation
  - fiber pullout
  - fiber pushout
  - fiber volume fraction
  - fiber-matrix interfaces
  - glass fiber reinforced plastics
  - glass fibers
  - graphite-epoxy composites
  - hybrid composites
  - kink bands
  - lay-up
  - metal fibers
  - metal matrix composites
  - micromechanics
  - reinforcing materials
  - resin transfer molding
  - superhybrid materials
  - synthetic fibers
  - whisker composites
  - woven composites
- reinforcing materials**
- DEF Fibers, filaments, fabrics, and other substances used for strengthening of matrices in composite materials.
- RT aramid fibers
    - composite materials
    - fabrics
    - fiber composites
    - fibers
  - ∞ filaments
  - ∞ materials
    - matrix materials
    - particulate reinforced composites
    - reinforcing fibers
- Reissner theory**
- RT Mindlin plates
    - plates (structural members)
    - stress analysis
  - ∞ theories
- Reissner-Mindlin plates*  
(added April 1998)
- USE **Mindlin plates**
- Reissner-Nordstrom solution**
- DEF The unique solution of general relativity theory describing a nonrotating, charged black hole.
- RT astronomical models
    - black holes (astronomy)
    - charged particles
    - gravitational effects
    - relativity
- rejection**
- RT acceptability
    - elimination
    - evaluation
    - exclusion
    - removal
    - selection
- relational data bases**  
(added June 1997)
- GS data bases
    - . **relational data bases**
  - RT architecture (computers)
    - computer systems design
    - data base management systems
    - data management
    - data retrieval
- ∞ **relationships**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - UF *interrelationships*
  - RT approximation
    - duality theorem
    - homology

## relative biological effectiveness (RBE)

stress-strain relationships

### relative biological effectiveness (RBE)

UF *RBE*

GS biological effects

. **relative biological effectiveness (RBE)**

RT ∞ biology  
physiological effects

### relativistic effects

RT Bose-Einstein condensates  
dimensions

∞ effects

gravitational lenses  
mass  
relativity  
time  
velocity

### relativistic electron beams

DEF Beams of electrons traveling at approximately the speed of light. Used for REB.

UF *REB*

GS beams (radiation)

. particle beams  
. . . electron beams  
. . . **relativistic electron beams**  
particles

. charged particles  
. . . energetic particles  
. . . electrons

. . . . high energy electrons  
. . . . **relativistic electron beams**

. corpuscular radiation

. . electron radiation

. . . electron beams

. . . . **relativistic electron beams**

. . energetic particles

. . . electrons

. . . . high energy electrons

. . . . **relativistic electron beams**

. elementary particles

. . fermions

. . . leptons

. . . . electrons

. . . . . high energy electrons

. . . . . **relativistic electron beams**

. relativistic particles

. . **relativistic electron beams**

RT beam plasma amplifiers

beta particles

controlled fusion

diffraction radiation

electron bombardment

electron scattering

inertial fusion (reactor)

ionizing radiation

plasma heating

plasma jets

plasma-particle interactions

### relativistic particles

DEF Particles with a velocity so large that their relativistic mass exceeds their rest mass by an amount which is significant for the computation or other considerations at hand.

GS particles

. **relativistic particles**

. . relativistic electron beams

RT Hamilton-Jacobi equation

### relativistic plasmas

GS particles

. charged particles

. . energetic particles

. . . plasmas (physics)

. . . . **relativistic plasmas**

. corpuscular radiation

. . energetic particles

. . . plasmas (physics)

. . . . **relativistic plasmas**

RT Astron thermonuclear reactor

bremsstrahlung

cosmic plasma

electron plasma

electron-positron plasmas

gravitational collapse

high temperature plasmas

pinch effect

plasma jets

plasma radiation

plasma-particle interactions

ponderomotive forces

### relativistic theory

UF *Wightman theory*

RT ∞ theories

### relativistic velocity

DEF A velocity sufficiently high that some properties of a particle of this velocity have values significantly different from those obtaining when the particle is at rest.

GS rates (per time)

. **relativistic velocity**

velocity

. **relativistic velocity**

RT high speed

∞ hypervelocity

light speed

particle motion

### relativity

DEF A principle that postulates the equivalence of the description of the universe, in terms of physical laws, by various observers, or for various frames of reference. Used for geometrodynamics and space-time continuum.

UF *geometrodynamics*

*space-time continuum*

RT big bang cosmology

continuums

differential geometry

event horizon

field theory (physics)

grand unified theory

gravitational lenses

Gravity Probe B

inertial reference systems

light-cone expansion

Lorentz contraction

naked singularities

nonrelativistic mechanics

paradoxes

ponderomotive forces

quantum mechanics

Reissner-Nordstrom solution

relativistic effects

Schwarzschild metric

space-time functions

string theory

supergravity

tensor analysis

unified field theory

### ∞ relaxation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT cross relaxation

molecular relaxation

refractory period

relaxation (mechanics)

relaxation (physiology)

relaxation method (mathematics)

### relaxation (mechanics)

GS **relaxation (mechanics)**

. spin-lattice relaxation

. stress relaxation

RT ∞ equilibrium

expansion

magnetic relaxation

molecular relaxation

nuclear relaxation

∞ reduction

∞ relaxation

relaxation method (mathematics)

relaxation time

residual stress

strain energy release rate

viscoelasticity

viscoplasticity

### relaxation (physiology)

RT compressibility effects

massaging

recreation

∞ relaxation

work-rest cycle

### relaxation method (mathematics)

DEF An iterative numerical method for solving elliptic partial differential equations, e.g., a Poisson equation.

GS analysis (mathematics)

. numerical analysis

. . approximation

. . . **relaxation method**

(mathematics)

RT computational fluid dynamics

∞ methodology

∞ relaxation

relaxation (mechanics)

### relaxation oscillators

GS oscillators

. **relaxation oscillators**

. . phantastrons

### relaxation time

DEF In general, the time required for a system, object, or fluid to recover to a specified condition or value after disturbance. Specifically, the time taken by an exponentially decaying quantity to decrease in amplitude by a factor of  $1/e = 0.3679$ .

GS time

. **relaxation time**

RT ∞ equilibrium

excitation

Maxwell bodies

molecular relaxation

relaxation (mechanics)

spin-lattice relaxation

time constant

### ∞ relay

SN

(USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT

disconnect devices

electric contacts

electric relays

logic circuits

radio relay systems

repeaters

### Relay 1 satellite

GS artificial satellites

. communication satellites

. . Relay satellites

. . . **Relay 1 satellite**

### Relay 2 satellite

GS artificial satellites

. communication satellites

. . Relay satellites

. . . **Relay 2 satellite**

### Relay satellites

GS artificial satellites

. communication satellites

. . **Relay satellites**

. . . Relay 1 satellite

. . . Relay 2 satellite

RT

Advent Project

Thor Delta launch vehicle

transoceanic communication

### releasing

GS **releasing**

. fiber pullout

. fiber pushout

RT

decoupling

∞ discharge

disconnect devices

dispersing

dumping

ejection

emission

emptying

exhaust emission

materials handling

relieving

scattering

spilling

unloading

venting

**reliability**

DEF Of a piece of equipment or a system, the probability of specified performance for a given period of time when used in the specified manner.

GS **reliability**

. aircraft reliability  
 . circuit reliability  
 . component reliability  
 . software reliability  
 . . computer program integrity  
 . spacecraft reliability  
 . structural reliability

## RT

acceptability  
 accuracy  
 aircraft survivability  
 allowances  
 assurance  
 censored data (mathematics)  
 computer systems performance  
 confidence  
 confidence limits  
 consistency  
 cumulative damage  
 ∞ design  
 design analysis  
 downtime  
 durability  
 dynamic characteristics  
 errors  
 estimates  
 expectation  
 failure analysis  
 forecasting  
 maintainability  
 maintenance  
 maximum likelihood estimates  
 mechanical properties  
 missile design  
 MTBF  
 nondestructive tests  
 ∞ performance  
 performance prediction  
 precision  
 prelaunch problems  
 probability theory  
 product development  
 production management  
 productivity  
 quality  
 quality control  
 redundancy  
 redundant components  
 risk  
 safety factors  
 sampling  
 specifications  
 stability  
 standards  
 statistical analysis  
 statistical distributions  
 statistical tests  
 ∞ statistics  
 system effectiveness  
 systems compatibility  
 systems engineering  
 ∞ tests  
 tolerances (mechanics)  
 total quality management  
 validity  
 variability  
 vulnerability

**reliability analysis**

RT ∞ analyzing  
 design analysis  
 performance prediction  
 preventive maintenance  
 software reliability  
 trend analysis

*reliability control*

USE **quality control**  
**reliability engineering**

**reliability engineering**

DEF The engineering discipline which formulates an acceptable combination of design

features, repair philosophy, and maintenance resources to achieve a specified level of reliability as an operational requirement, at optimum life cycle costs.

UF *reliability control*

RT complex systems  
 concurrent engineering  
 ∞ engineering  
 fault detection  
 fault tolerance  
 lessons learned  
 performance prediction  
 quality control  
 sneak circuit analysis  
 system effectiveness  
 system identification  
 systems compatibility  
 systems engineering  
 Taguchi methods  
 total quality management  
 value engineering

**relic radiation**

DEF Background radiation resulting from the primordial big bang.

RT astronomy  
 astrophysics  
 background radiation  
 big bang cosmology  
 cosmic microwave background  
 radiation  
 extraterrestrial radiation  
 large-scale structure of the universe  
 Microwave Anisotropy Probe  
 Population III stars  
 ∞ radiation  
 Sunyaev-Zeldovich effect  
 universe

**relief maps**

GS maps  
 . **relief maps**  
 RT digital elevation models  
 hypsography  
 photogrammetry  
 photomaps  
 topography

**relief valves**

GS control equipment  
 . regulators  
 . . automatic control valves  
 . . . **relief valves**  
 valves  
 . automatic control valves  
 . . **relief valves**  
 RT automatic control  
 bypasses  
 fuel tank pressurization  
 fuel valves  
 gas valves  
 hydraulic equipment  
 pressure regulators  
 reactor safety  
 venting  
 vents

**relieving**

GS **relieving**  
 . stress relieving  
 RT ∞ discharge  
 exhausting  
 purging  
 releasing

**relocation**

RT installing  
 positioning  
 replacing

**reluctance**

DEF The ratio of the magnetomotive force to the magnetic flux through any cross section of the magnetic circuit.

UF *reluctivity*  
 GS magnetic properties  
 . **reluctance**  
 RT magnetic permeability

magneto-resistivity

*reluctivity*USE **reluctance***remagnetization*USE **magnetization****remanence**

DEF The magnetic flux density which remains in a magnetic circuit after the removal of an applied magnetomotive force. Also called retentivity.

GS magnetic properties

. **remanence**  
 RT flux density  
 paleomagnetism

*remelting*USE **melting****remodulation**

RT demodulation  
 intermodulation  
 modulation

**remote consoles**

GS computer components  
 . peripheral equipment (computers)  
 . . **remote consoles**  
 consoles  
 . **remote consoles**  
 data processing equipment  
 . peripheral equipment (computers)  
 . . **remote consoles**  
 RT computer components  
 computer graphics  
 data links  
 data processing terminals  
 display devices  
 plotters  
 readout

**remote control**

DEF Control of an operation from a distance, especially by means of electricity or electronics; a controlling switch, lever, or other device used in this kind of control. Used for electromagnetic control.

UF *electromagnetic control*GS **remote control**

. radio control  
 RT aircraft control  
 antiradiation missiles  
 attitude control  
 automatic control  
 ∞ automation  
 cascade control  
 ∞ control  
 control boards  
 controllers  
 digital command systems  
 dynamic characteristics  
 electric control  
 electronic control  
 engine control  
 flight control  
 ground based control  
 guidance (motion)  
 hydraulic control  
 ∞ instruments  
 Kalman-Schmidt filtering  
 manipulators  
 manual control  
 missile control  
 optical control  
 pneumatic control  
 remote manipulator system  
 rocket engine control  
 satellite control  
 servocontrol  
 servomechanisms  
 spacecraft control  
 teleoperators  
 telerobotics  
 temperature control  
 turbojet engine control

## remote handling

visual control

### remote handling

UF *telechirics*  
GS materials handling  
. **remote handling**  
RT manipulators  
payload deployment & retrieval system  
Space Station Mobile Servicing System  
teleoperators

### remote manipulator system

DEF Devices used in space for deploying and retrieving payloads by remote control; also used for space maintenance and/or servicing of satellites and other spacecraft.

GS manipulators  
. **remote manipulator system**  
. . Space Station Mobile Servicing System  
RT payload deployment & retrieval system  
payload retrieval (STS)  
remote control  
space maintenance  
space transportation system  
∞ systems

### remote regions

GS regions  
. **remote regions**  
. . Antarctic regions  
. . . McMurdo sound  
. . . Ross ice shelf  
. . Arctic regions  
. . . subarctic regions  
RT deserts  
Mojave Desert (CA)  
offshore reactor sites  
Sahara Desert (Africa)  
wilderness

### remote sensing

DEF The collection of information about an object or phenomena by a recording device that is not in physical contact with it. The term is usually restricted to mean the methods for, and activity of, recording features and phenomena of the Earth surface from a remote platform or vehicle. Typically the methods used record reflected or radiated electromagnetic energy, such as radiometry, photometry, spectrometry, and photographic and radar techniques.

GS detection  
. **remote sensing**  
RT aeromagnetism  
airborne radar  
Aqua spacecraft  
Aura spacecraft  
band ratioing  
CALIPSO (Pathfinder satellite)  
CERES (experiment)  
change detection  
CloudSat  
cluster analysis  
Coastal Zone Color Scanner  
data products  
desertification  
differential absorption lidar  
DMSP satellites  
Earth Observing System (EOS)  
Earth resources  
Envisat-1 satellite  
EOS data and information system  
Feature Identification and Location  
Exper  
FIRE (climatology)  
geographic distribution  
geographic information systems  
GRACE mission  
image analysis  
image classification  
imaging spectrometers  
in situ measurement  
ISCCP Project  
Landsat 6  
Landsat 7  
leaf area index

low Earth orbits  
Mapsat  
MISR (radiometry)  
Mission to Planet Earth  
MODIS (radiometry)  
multisensor applications  
multisensor fusion  
Multispectral Resource Sampler  
NOAA 19 satellite  
normalized difference vegetation index  
NPOESS  
observation scheduling  
Orbiting Carbon Observatory (OCO)  
OSTA-3 payload  
pixels  
planetary geology  
plant stress  
Priroda module  
recognition  
Shuttle Imaging Radar  
small satellite technology  
space station polar platforms  
spectral mixture analysis  
Surface Meteorology and Solar Energy project  
Surface Radiation Budget project  
swath width  
Terra spacecraft  
thematic mappers (LANDSAT)  
vegetative index

### remote sensors

GS **remote sensors**  
. thematic mappers (LANDSAT)  
RT Advanced Microwave Sounding Unit  
Advanced Very High Resolution Radiometer  
AgRISTARS project  
airborne lasers  
airborne radar  
automatic weather stations  
Coastal Zone Color Scanner  
crop identification  
crop inventories  
data acquisition  
data collection platforms  
data products  
∞ detectors  
Earth resources  
Earthnet  
EROS (satellites)  
Feature Identification and Location  
Exper  
geographic applications program  
haze detection  
image classification  
imaging radar  
measuring instruments  
multisensor applications  
ocean color scanner  
∞ probes  
radiometric resolution  
satellite-borne instruments  
Sea-viewing Wide Field-of-view Sensor  
∞ sensors  
spaceborne lasers  
transducers  
wildlife radiolocation

### remotely piloted vehicles

UF *RPV*  
RT ∞ aircraft  
DAST program  
drone aircraft  
highly maneuverable aircraft  
Jindivik target aircraft  
oblique wings  
orbital maneuvering vehicles  
pilotless aircraft  
target drone aircraft  
unmanned aircraft systems  
unmanned ground vehicles  
VATOL aircraft  
∞ vehicles

### removal

GS **removal**  
. carbon dioxide removal

. paint removal  
RT anodic stripping  
cancellation  
clearing  
deletion  
depletion  
disposal  
dissipation  
ejection  
emptying  
evacuating (transportation)  
evacuating (vacuum)  
exhausting  
expulsion  
extraction  
materials recovery  
∞ reduction  
rejection  
∞ separation  
unloading  
wear

### REMS

USE **rapid eye movement state**

### renal calculi

USE **calculi**  
**kidney stones**

### renal function

RT ∞ functions  
glomerulus  
kidney stones  
kidneys  
vasopressins

### rendezvous

DEF The event of two or more objects meeting with zero relative velocity at a preconceived time and place. The point in space at which such an event takes place, or is to take place.

#### GS rendezvous

. space rendezvous  
. . orbital rendezvous  
. . . Earth orbital rendezvous  
. . . lunar orbital rendezvous

RT Apollo Soyuz test project  
flight mechanics  
interception  
maneuvers  
orbital mechanics

### rendezvous guidance

GS guidance (motion)  
. **rendezvous guidance**  
RT Automated Transfer Vehicle  
autonomous docking  
command guidance  
homing devices  
injection guidance  
midcourse guidance  
orbital rendezvous  
proportional navigation  
satellite guidance  
spacecraft guidance  
terminal guidance

### rendezvous spacecraft

GS maneuverable spacecraft  
. **rendezvous spacecraft**  
RT Columbus space station  
command guidance  
ferry spacecraft  
interplanetary spacecraft  
lunar spacecraft  
manned spacecraft  
military spacecraft  
orbital rendezvous  
recoverable spacecraft  
space capsules  
space stations  
spacecrew transfer  
unmanned spacecraft

### rendezvous trajectories

GS trajectories  
. **rendezvous trajectories**  
RT ascent trajectories  
circumlunar trajectories  
Earth orbital rendezvous

Earth-Moon trajectories  
 flight mechanics  
 interplanetary trajectories  
 Near Earth Asteroid Rendezvous  
     Mission  
 orbital mechanics  
 orbital rendezvous  
 Rosetta mission  
 space rendezvous  
 spacecraft docking  
 spacecraft trajectories

**Rene 41**

GS alloys  
   . chromium alloys  
   . . **Rene 41**  
   . cobalt alloys  
   . . **Rene 41**  
   . heat resistant alloys  
   . . refractory metal alloys  
   . . . molybdenum alloys  
   . . . . **Rene 41**  
   . nickel alloys  
   . . **Rene 41**  
   refractory materials  
   . refractory metal alloys  
   . . molybdenum alloys  
   . . . **Rene 41**  
 RT wrought alloys

**Rene 63**

GS alloys  
   . chromium alloys  
   . . **Rene 63**  
   . cobalt alloys  
   . . **Rene 63**  
   . heat resistant alloys  
   . . refractory metal alloys  
   . . . molybdenum alloys  
   . . . . **Rene 63**  
   . nickel alloys  
   . . **Rene 63**  
   refractory materials  
   . refractory metal alloys  
   . . molybdenum alloys  
   . . . **Rene 63**  
 RT wrought alloys

**Rene 77**

GS alloys  
   . chromium alloys  
   . . **Rene 77**  
   . cobalt alloys  
   . . **Rene 77**  
   . heat resistant alloys  
   . . refractory metal alloys  
   . . . molybdenum alloys  
   . . . . **Rene 77**  
   . nickel alloys  
   . . **Rene 77**  
   refractory materials  
   . refractory metal alloys  
   . . molybdenum alloys  
   . . . **Rene 77**  
 RT wrought alloys

**Rene 95**

DEF High-strength nickel-base superalloy.  
 GS alloys  
   . chromium alloys  
   . . **Rene 95**  
   . cobalt alloys  
   . . **Rene 95**  
   . heat resistant alloys  
   . . refractory metal alloys  
   . . . molybdenum alloys  
   . . . . **Rene 95**  
   . nickel alloys  
   . . **Rene 95**  
   refractory materials  
   . refractory metal alloys  
   . . molybdenum alloys  
   . . . **Rene 95**

**renewable energy**

(added December 1998)  
 GS **renewable energy**  
   . geothermal energy utilization  
   . hydroelectricity  
   . tidepower

. waterwave energy  
 . windpower utilization  
 RT bioconversion  
   biomass energy production  
   clean energy  
   energy policy  
 ∞ energy sources  
   energy technology  
   geothermal energy conversion  
   hydrogen-based energy  
   ocean thermal energy conversion  
   solar energy conversion  
   Surface Meteorology and Solar  
     Energy project  
   waste utilization  
   waterwave energy conversion

**renin**

(added August 2004)  
 DEF An enzyme whihc is secreted by the kidney and is formed from protein in plasma and kidney. The enzyme cleaves the Leu-Leu bond in angiotensinogen to generate angiotensin I.  
 GS biopolymers  
   . proteins  
   . . enzymes  
   . . . **renin**  
   organic compounds  
   . proteins  
   . . enzymes  
   . . . **renin**  
 RT angiotensins  
   kidneys

**renormalization group methods**

(added August 1990)  
 RT Monte Carlo method  
   normalizing (statistics)  
   statistical mechanics  
   turbulence models

**reorientation**

USE **retraining**

**repairing**

USE **maintenance**

**repeaters**

UF *interpolators*  
 GS transmitters  
   . **repeaters**  
 RT amplifiers  
   radar receivers  
   receivers  
 ∞ relay  
 ∞ translators

**repetition**

RT counting  
   pattern recognition  
   redundancy encoding

**replacing**

RT damage assessment  
   installing  
   maintenance  
   relocation  
   replenishment  
   substitutes

**replenishment**

RT filling  
   input  
 ∞ loading  
   refilling  
   refueling  
   replacing

**replicas**

RT electron microscopes  
   metallography  
   models  
   reproduction (copying)

**report generators**

RT computer programs  
   computer systems programs  
 ∞ generators

user manuals (computer programs)

**reports**

GS **reports**  
   . congressional reports  
   . postlaunch reports  
   . Presidential reports  
   . wage surveys  
 RT aerospace technology transfer  
   conferences  
 ∞ discussion  
   documentation  
   documents  
   information  
   information dissemination  
   papers  
   proposals  
   records  
   summaries  
   supplements  
   technology transfer

**representations**

RT characterization  
   descriptions  
   drawings  
   graphs (charts)  
   images  
   photographs  
   signatures

∞ **reproduction**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT fertilization  
   reproduction (biology)  
   reproduction (copying)  
   reproductive systems

**reproduction (biology)**

RT ∞ biology  
   birth  
   breeding (reproduction)  
   cell division  
   cloning (biology)  
   embryology  
   fertility  
   fetuses  
   mitosis  
   progeny  
 ∞ reproduction  
   reproductive systems  
   sex glands  
   zygotes

**reproduction (copying)**

UF *duplicating*  
 GS imagery  
   . **reproduction (copying)**  
   . . xerography  
 RT blueprints  
   document storage  
   drawings  
   engineering drawings  
   lithography  
   microfilms  
   photographic processing equipment  
   photography  
   printing  
   replicas  
 ∞ reproduction  
   stencil processes

**reproductive systems**

GS anatomy  
   . genitourinary system  
   . . **reproductive systems**  
   . . . sex glands  
   . . . . gonads  
   . . . . . ovaries  
   . . . . . testes  
   . . . . prostate gland  
   . . . uterus  
 RT birth  
   chromosomes  
   fertility  
   fetuses  
 ∞ reproduction  
   reproduction (biology)

## reptiles

∞ systems

### reptiles

- GS animals
  - . vertebrates
  - . . . **reptiles**
  - . . . lizards
  - . . . snakes
  - . . . turtles
- RT poikilothermia

### Republic aircraft

- GS **Republic aircraft**
  - . A-10 aircraft
  - . F-84 aircraft
  - . F-105 aircraft
- RT ∞ aircraft

*Republic of China*

USE **Taiwan**

*Republic of Korea*

USE **South Korea**

### Republic of South Africa

- UF *South Africa*
- GS nations
  - . **Republic of South Africa**
- RT Africa
  - Botswana
  - Kalahari Basin (Africa)
  - Lesotho
  - Namibia
  - Swaziland

*Republic of Vietnam*

USE **Vietnam**

*repulsion*

USE **force**

### requirements

- GS **requirements**
  - . user requirements
- RT specifications

### rescue operations

- RT aeronautical satellites
  - Assured Crew Return Vehicle
  - COSPAS
  - HH-65 helicopter
  - Marots (ESA)
- ∞ operations
  - SarSat
  - spacecraft recovery
  - X-38 crew return vehicle

### research

- GS **research**
  - . dynamic programming
  - . high temperature research
  - . linear programming
  - . low density research
  - . market research
  - . multidisciplinary research
  - . nonlinear programming
  - . nuclear research
  - . quadratic programming
- RT critical path method
- ∞ design
  - ethics
  - exploration
  - interservice data exchange program
  - investigation
  - minimax technique
- ∞ research projects

### research aircraft

- UF *experimental aircraft*
  - ornithopter aircraft*
- GS research vehicles
  - . **research aircraft**
  - . . Avian 2/180 autogiro
  - . . AVRO 707 aircraft
  - . . B-70 aircraft
  - . . Breguet 940 aircraft
  - . . C-8A augmentor wing aircraft
  - . . D-558 aircraft
  - . . FD 2 aircraft
  - . . Firebee 2 target drone aircraft
  - . . H-17 helicopter

- . . H-126 aircraft
- . . HP-115 aircraft
- . . meteorological research aircraft
- . . Nord 1500 aircraft
- . . Questol aircraft
- . . rotor systems research aircraft
- . . SC-1 aircraft
- . . U-2 aircraft
- . . VZ-2 aircraft
- . . VZ-8 aircraft
- . . X-1 aircraft
- . . X-2 aircraft
- . . X-3 aircraft
- . . X-5 aircraft
- . . X-13 aircraft
- . . X-14 aircraft
- . . X-15 aircraft
- . . X-19 aircraft
- . . X-20 aircraft
- . . X-21 aircraft
- . . X-21A aircraft
- . . X-22 aircraft
- . . X-22A aircraft
- . . X-24 aircraft
- . . X-31 aircraft
- . . X-32 aircraft
- . . X-35 aircraft
- . . X-36 aircraft
- . . X-45 aircraft
- . . XH-51 helicopter
- . . XV-4 aircraft
- . . XV-5 aircraft
- . . XV-8A aircraft
- . . XV-9A aircraft
- . . XV-11A aircraft

RT aerospace planes

∞ aircraft

- drone aircraft
- fan in wing aircraft
- flight test vehicles
- flying platforms
- ground effect machines
- hovercraft ground effect machines
- hypersonic aircraft
- jet aircraft
- joined wings
- ∞ military aircraft
  - nuclear propelled aircraft
  - rocket planes
  - submersible aircraft
  - supersonic aircraft
  - tailless aircraft
  - tandem wing aircraft
  - test vehicles
  - tilt wing aircraft
  - V/STOL aircraft
  - vertical takeoff aircraft
- ∞ winged vehicles
  - YF-12 aircraft

### research and development

- RT ∞ design
  - investigation
  - management planning
  - operations research
  - outer space treaty
  - programs
  - project management
  - proposals
- ∞ research projects
  - systems engineering
  - technology utilization
  - weapons development

### research facilities

- RT ∞ facilities
  - laboratories
- ∞ research projects
  - space industrialization
  - space laboratories
  - test facilities

### research management

- GS management
  - . **research management**
- RT allocations
  - block diagrams
- ∞ budgets
  - engineering management
  - feasibility analysis

- goals
- industrial management
- manpower
- multidisciplinary research
- operations research
- personnel
- priorities

### ∞ research projects

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Chinese space program
  - Earth & Ocean Physics Applications Program
  - French space program
  - Indian space program
  - Japanese space program
  - management
  - NASA programs
  - programs
  - project management
  - projects
  - research
  - research and development
  - research facilities
  - space programs
  - SPHINX

### research vehicles

- SN (VEHICLES DESIGNED TO BE SUBJECTS OF RESEARCH--NOT RESEARCH EQUIPMENT CONTAINERS)
- GS **research vehicles**
  - . automated mixed traffic vehicles
  - . research aircraft
  - . . Avian 2/180 autogiro
  - . . AVRO 707 aircraft
  - . . B-70 aircraft
  - . . Breguet 940 aircraft
  - . . C-8A augmentor wing aircraft
  - . . D-558 aircraft
  - . . FD 2 aircraft
  - . . Firebee 2 target drone aircraft
  - . . H-17 helicopter
  - . . H-126 aircraft
  - . . HP-115 aircraft
  - . . meteorological research aircraft
  - . . Nord 1500 aircraft
  - . . Questol aircraft
  - . . rotor systems research aircraft
  - . . SC-1 aircraft
  - . . U-2 aircraft
  - . . VZ-2 aircraft
  - . . VZ-8 aircraft
  - . . X-1 aircraft
  - . . X-2 aircraft
  - . . X-3 aircraft
  - . . X-5 aircraft
  - . . X-13 aircraft
  - . . X-14 aircraft
  - . . X-15 aircraft
  - . . X-19 aircraft
  - . . X-20 aircraft
  - . . X-21 aircraft
  - . . X-21A aircraft
  - . . X-22 aircraft
  - . . X-22A aircraft
  - . . X-24 aircraft
  - . . X-31 aircraft
  - . . X-32 aircraft
  - . . X-35 aircraft
  - . . X-36 aircraft
  - . . X-45 aircraft
  - . . XH-51 helicopter
  - . . XV-4 aircraft
  - . . XV-5 aircraft
  - . . XV-8A aircraft
  - . . XV-9A aircraft
  - . . XV-11A aircraft
  - . . underwater research laboratories
  - . . X-30 vehicle
  - . . X-37 vehicle
  - . . X-40A vehicle
  - . . X-43 vehicle
- RT boats
  - electric motor vehicles
- ∞ flight vehicles
  - lunar roving vehicles
  - Mars roving vehicles
- ∞ military vehicles

- roving vehicles
  - ships
  - space laboratories
  - ∞ spacecraft
  - ∞ surface effect ships
  - ∞ underwater vehicles
  - ∞ vehicles
  - ∞ water vehicles
- reserpine**
- GS bases (chemical)
    - . alkaloids
    - . . . **reserpine**
  - drugs
    - . pentobarbital sodium
    - . . . **reserpine**
  - nitrogen compounds
    - . alkaloids
    - . . . **reserpine**
  - organic compounds
    - . cyclic compounds
    - . . . heterocyclic compounds
    - . . . . alkaloids
    - . . . . . **reserpine**
  - RT antihypertensive agents
- reserves**
- RT abundance
  - availability
  - backups
  - contingency
  - crude oil
  - economic factors
  - energy policy
  - estimates
  - estimating
  - evaluation
  - exploitation
  - exploration
  - forecasting
  - inventories
  - inventory controls
  - ∞ materials
  - ∞ mineral deposits
  - ∞ mines (excavations)
  - ∞ production
  - ∞ resources
  - ∞ stockpiling
  - ∞ storage
- reservoirs**
- SN (FOR SURFACE WATER STORAGE--NOT OIL OR GAS POOLS)
  - RT dams
  - evaporation
  - fresh water
  - lagoons
  - Lake Texoma (OK-TX)
  - lakes
  - ponds
  - rivers
  - solar ponds (heat storage)
  - streams
  - water resources
  - windpowered pumps
- residential areas**
- RT cities
  - inhabitants
  - land
  - land use
  - megalopolises
  - regional planning
  - rural areas
  - suburban areas
  - urban development
- residential energy**
- DEF Household energy requirements in residences, apartments, etc.
  - RT energy conservation
  - energy technology
  - heat pumps
  - solar cooling
  - solar heating
  - solar houses
  - space cooling (buildings)
  - space heating (buildings)
- water heating
- residual gas**
- GS gases
    - . **residual gas**
  - RT getters
  - high vacuum
  - outgassing
  - partial pressure
  - ultrahigh vacuum
  - vacuum apparatus
  - vacuum tubes
- residual strength**
- RT crack propagation
  - fatigue (materials)
  - fracture mechanics
  - fracture strength
  - residual stress
  - ∞ strength
  - tensile strength
- residual stress**
- DEF In structures, any stress in an unloaded body. These stresses arise from local yielding of the material due to machining, welding, quenching or cold working. Used for internal stress.
  - UF *internal stress*
  - GS stresses
    - . **residual stress**
  - RT creep properties
  - machining
  - relaxation (mechanics)
  - residual strength
  - strain hardening
  - stress relaxation
  - stress relieving
  - stress-strain relationships
  - temperature inversions
- residues**
- RT ashes
  - organic wastes (fuel conversion)
  - reaction products
  - solid wastes
  - waste treatment
  - waste water
  - wastes
- resilience**
- GS mechanical properties
    - . **resilience**
  - RT compressive strength
  - elastic properties
  - shear properties
  - springs (elastic)
  - tensile strength
- resin bonding**
- GS bonding
    - . **resin bonding**
  - RT adhesive bonding
  - metal bonding
  - metal-metal bonding
- resin film infusion**
- (added August 1997)
  - UF *RFI (composite materials)*
  - RT composite materials
  - composite structures
  - fabrication
  - infiltration
  - polymer matrix composites
  - preforms
  - resin matrix composites
  - resin transfer molding
- resin matrix composites**
- DEF Composite materials utilizing a matrix of filaments and/or fibers of glass, metal, or other material bound with a polymer or resin.
  - GS composite materials
    - . **resin matrix composites**
    - . . boron-epoxy composites
    - . . carbon-phenolic composites
    - . . graphite-epoxy composites
  - RT aramid fibers
  - bismaleimide
  - epoxy resins
- hybrid composites
  - matrix materials
  - metal matrix composites
  - PEEK
  - polyimide resins
  - polymer matrix composites
  - prepregs
  - pultrusion
  - resin film infusion
  - resin transfer molding
  - resins
  - sheet molding compounds
- resin transfer molding**
- (added May 1992)
  - UF *RTM (composite materials)*
  - GS forming techniques
    - . **resin transfer molding**
  - RT casting
  - composite materials
  - curing
  - fabrication
  - fiber composites
  - injection molding
  - matrix materials
  - molding materials
  - molds
  - polymer matrix composites
  - preforms
  - reinforcing fibers
  - resin film infusion
  - resin matrix composites
- resins**
- GS **resins**
    - . alkyd resins
    - . ion exchange resins
    - . polyimide resins
    - . polyurethane resins
    - . silicone resins
    - . synthetic resins
    - . . addition resins
    - . . . acrylic resins
    - . . . vinyl copolymers
    - . . polyester resins
    - . . polyether resins
    - . . . PEEK
    - . . . polymethyl methacrylate
    - . . thermoplastic resins
    - . . . PEEK
    - . . . quinoxalines
    - . . . thermoplastic films
    - . . thermosetting resins
    - . . . epoxy resins
    - . . . phenolic epoxy resins
    - . . . furan resins
    - . . . polyamide resins
    - . . . . Kevlar (trademark)
    - . . . . Nylon (trademark)
    - . . . phenolic resins
    - . . . micarta
    - . . . phenolic epoxy resins
  - RT acrylates
  - Bakelite (trademark)
  - bismaleimide
  - Delrin (trademark)
  - fillers
  - Lexan (trademark)
  - melamine
  - paraplasts
  - ∞ patterns
  - phenol formaldehyde
  - phloroglucinol
  - plastisols
  - resin matrix composites
  - teflon (trademark)
- ∞ **resistance**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - DEF In electricity, the factor by which the square of the instantaneous conduction current must be multiplied to obtain the power lost by heat dissipation or other permanent radiation of energy away from the electrical current. In mechanics, the opposition by frictional effects to forces tending to produce motion. Used for conductance and resistance coefficients.
  - UF *conductance*



## resistance heating

*resistance coefficients*

RT abrasion resistance  
acceleration tolerance  
acoustic properties  
aerodynamic drag  
chemical properties  
constrictions  
contact resistance  
corrosion resistance  
crack propagation  
creep strength  
damping  
diffusivity  
durability  
earthquake resistance  
electrical properties  
electrical resistance  
electrical resistivity  
flammability  
flow resistance  
fracture strength  
fusibility  
Hall resistance  
∞ high resistance  
immunity  
impact resistance  
impact strength  
impedance  
Kapitza resistance  
life (durability)  
∞ low resistance  
magnetoresistivity  
moisture resistance  
negative resistance circuits  
negative resistance devices  
oxidation resistance  
permeability  
prevention  
protection  
quality  
radiation tolerance  
resistance thermometers  
retarding  
sensitivity  
shock resistance  
skin resistance  
stability  
thermal resistance  
tolerances (physiology)  
transconductance  
vulnerability  
wave resistance  
wear resistance

*resistance coefficients*

USE **resistance**

### resistance heating

UF *Joule heating*  
GS heating  
. **resistance heating**  
RT arc heating  
electroslag refining  
gas heating  
levitation melting

### resistance thermometers

GS measuring instruments  
. temperature measuring instruments  
. . . thermometers  
. . . **resistance thermometers**  
RT bolometers  
ohmmeters  
∞ resistance  
temperature measurement  
thermocouple pyrometers

*resistivity*

USE **electrical resistivity**

### resistojet engines

UF *resistojets*  
GS engines  
. rocket engines  
. . . electric rocket engines  
. . . electrothermal engines  
. . . **resistojet engines**  
RT arc jet engines  
plasma engines  
pulsed jet engines

space station propulsion

*resistojets*

USE **resistojet engines**

### resistors

UF *tunnel resistors*  
GS attenuators  
. **resistors**  
. . . potentiometers (resistors)  
. . . printed resistors  
. . . thermistors  
RT ballasts (impedances)  
electric conductors  
electric filters  
electric reactors  
∞ filaments  
photoconductors  
semiconductors (materials)  
solid state devices  
varistors

### resolution

DEF The ability of a film, a lens, a combination of both, or a vidicon system to render barely distinguishable a standard pattern of black and white lines. In radar, the minimum angular separation at the antenna at which two targets can be distinguished (a function of beamwidth); or the minimum range at which two targets at the same azimuth can be separated (equal to one half the pulse height). Of a gyro, a measure of response to small changes in input; the maximum value of the minimum input change that will cause a detectable change in the output for inputs greater than the threshold, expressed as a percent of one half the input range. Used for resolving power.

UF *resolving power*

GS **resolution**

. angular resolution  
. high resolution  
. image resolution  
. radar resolution  
. radiometric resolution  
. spatial resolution  
. spectral resolution  
. temporal resolution

RT

accuracy  
automatic traffic advisory and resolution  
blurring  
character recognition  
contrast  
definition  
dynamic characteristics  
errors  
foci  
high resolution coverage antennas  
image contrast  
image enhancement  
legibility  
loci  
numerical aperture  
∞ optics  
perception  
∞ power  
precision  
resolution cell  
sensitivity  
spatial filtering  
Stark effect  
∞ thresholds  
tolerances (mechanics)  
visibility  
vision

### resolution cell

RT ∞ cells  
imaging techniques  
radar detection  
radar imagery  
resolution

### resolvers

RT analog computers  
instrument transformers

transformers

*resolving power*

USE **resolution**

### resonance

DEF The phenomena of amplification of a free wave or oscillation of a system by a forced wave or oscillation of exactly equal period. The forced wave may arise from an impressed force upon the system or from a boundary condition. The growth of the resonant amplitude is characteristically linear in time. Of a system in forced oscillation, the condition which exists when any change, however small, in the frequency of excitation causes a decrease in the response of the system.

GS **resonance**

. baryon resonance  
. cyclotron resonance  
. . . electron cyclotron resonance  
. magnetic resonance  
. . . ferromagnetic resonance  
. . . nuclear magnetic resonance  
. . . . proton magnetic resonance  
. . . . proton resonance  
. . . paramagnetic resonance  
. . . . electron paramagnetic resonance  
. magnetosonic resonance  
. meson resonance  
. . X mesons  
. acoustic resonance  
. microwave resonance  
. nuclear quadrupole resonance  
. optical resonance  
. orbital resonances (celestial mechanics)  
. plasma resonance  
. resonant vibration  
. spin resonance

RT

Foster theory  
oscillations  
Overhauser effect  
resonant frequencies  
syntony  
tuning  
vibration

### resonance charge exchange

GS exchanging  
. charge exchange  
. . . **resonance charge exchange**  
RT spin exchange

### resonance fluorescence

DEF The emission of radiation by a gas or vapor as a result of excitation of atoms to a higher energy level by incident photons at the resonance frequency of the gas or vapor. Used for resonance radiation.

UF *resonance radiation*

GS emission

. light emission  
. . . luminescence  
. . . . fluorescence  
. . . . **resonance fluorescence**

RT

atomic excitations  
atomic physics  
quantum electrodynamics  
∞ radiation

### resonance lines

DEF Spectral lines which occur either as absorption or emission lines. Used for dielectric satellite lines.

UF *dielectronic satellite lines*

RT line spectra  
optical resonance  
plasma resonance

### resonance probes

GS measuring instruments  
. **resonance probes**  
RT impedance probes  
magnetic probes  
microwave plasma probes  
plasma diagnostics  
plasma resonance

- tuners
- resonance radiation*
- USE **resonance fluorescence**
- resonance scattering**
  - SN (INTERACTION WITH THE INTERIOR OF THE NUCLEUS—EXCLUDES POTENTIAL SCATTERING)
  - GS nuclear reactions
    - . nuclear scattering
    - . . **resonance scattering**
  - scattering
    - . nuclear scattering
    - . . **resonance scattering**
  - RT inverse scattering
    - Mossbauer effect
    - neutron scattering
- resonance testing**
  - RT damping tests
    - elastic damping
    - electronic equipment tests
    - fatigue tests
    - resonant frequencies
    - stability tests
    - static tests
    - structural stability
  - ∞ tests
    - vibration tests
    - viscous damping
- resonant cavities*
- USE **cavity resonators**
- resonant frequencies**
  - DEF Frequencies at which resonance exists. Used for natural frequencies and vibrational frequencies (structural).
  - UF *natural frequencies*
    - vibrational frequencies (structural)*
  - GS frequencies
    - . **resonant frequencies**
  - RT acoustic frequencies
    - acoustic resonance
    - antinodes
    - bandwidth
    - beat frequencies
    - Bordoni peaks
    - cavity resonators
    - critical frequencies
    - critical velocity
    - damping
    - dynamic characteristics
  - ∞ dynamics
    - electromagnetic absorption
    - harmonics
    - impedance
    - Mossbauer effect
    - nodes (standing waves)
    - oscillators
    - resonance
    - resonance testing
    - resonators
    - standing waves
    - transient response
    - tuners
    - tuning
- resonant tunneling**
  - (added September 1988)
  - RT barrier layers
    - electron tunneling
    - negative resistance devices
    - quantum electronics
    - quantum wells
    - resonant tunneling diodes
    - transistors
    - tunnel diodes
  - ∞ tunneling
- resonant tunneling diodes**
  - (added September 2008)
  - DEF Solid-state, nanoelectronic devices capable of producing negative differential resistance comprised of one or more narrow quantum well structures each containing only a single, resonant energy level.
  - GS electronic equipment
    - . diodes
    - . . semiconductor diodes
- . . . tunnel diodes
  - . . . . **resonant tunneling diodes**
- . solid state devices
  - . . semiconductor devices
  - . . . **resonant tunneling diodes**
- negative resistance devices
  - . **resonant tunneling diodes**
- RT barrier layers
  - heterojunctions
  - holes (electron deficiencies)
  - integrated circuits
  - nanotechnology
  - negative resistance circuits
  - quantum electronics
  - quantum wells
  - resonant tunneling
  - ∞ solid state physics
- resonant vibration**
  - UF *mechanical resonance*
  - GS resonance
    - . **resonant vibration**
  - vibration
    - . **resonant vibration**
  - RT acoustic resonance
    - damping
    - dynamic stability
  - ∞ dynamics
    - flapping
    - flutter
    - mechanical oscillators
    - oscillations
    - Q factors
    - stable oscillations
    - structural vibration
    - undamped oscillations
- resonators**
  - DEF In radio and radar applications, circuits which will resonate at a given frequency, or over a range of frequencies, when properly excited.
  - GS **resonators**
    - . cavity resonators
    - . . superconducting cavity resonators
    - . Helmholtz resonators
    - . multimode resonators
    - . optical resonators
  - RT delta antennas
    - electron tubes
    - frequency standards
    - grazing flow
    - magnetrons
    - masers
    - oscillators
    - resonant frequencies
    - self excitation
    - tuning
    - tuning fork gyroscopes
- resource allocation**
  - GS allocations
    - . **resource allocation**
  - management
    - . resources management
    - . . **resource allocation**
  - RT distributing
    - energy conservation
    - energy policy
    - engineering management
    - logistics
    - NASA Interactive Planning System
    - outer space treaty
    - priorities
    - products
    - resources
- resources**
  - GS **resources**
    - . Earth resources
    - . . forests
    - . . . rain forests
    - . . fossil fuels
    - . . . coal
    - . . . . anthracite
    - . . . . lignite
    - . . . . solvent refined coal
    - . . . crude oil
    - . . natural gas
    - . . . liquefied natural gas
    - . . . peat
- . . . shale oil
- . . glaciers
- . . icebergs
- . . kerogen
- . . land ice
- . . marine resources
- . . oil fields
- . . range resources
- . . springs (water)
- . . tar sands
- . . thermal resources
  - . . . geothermal resources
  - . . . . geysers
- . . underwater resources
- . . water resources
  - . . . aquifers
- . extraterrestrial resources
  - . . lunar resources
  - . Internet resources
  - . . websites
- RT abundance
  - availability
  - consulting
  - depletion
  - economic development
  - economic factors
  - economic impact
  - economics
  - energy conservation
  - energy policy
  - engineering management
  - geothermal technology
  - Great Lakes (North America)
  - inventory management
  - logistics
  - logistics management
  - man environment interactions
  - manpower
  - ∞ materials
    - Mississippi River (US)
  - personnel
  - personnel development
  - production management
  - recycling
  - reserves
  - resource allocation
  - site selection
  - urban development
  - vegetation
- resources management**
  - GS management
    - . **resources management**
    - . . forest management
    - . . . reforestation
    - . . information resources management
    - . . land management
    - . . resource allocation
  - RT Earth resources
    - environment management
    - environmental control
    - leasing
    - NASA Interactive Planning System
    - thermal resources
    - water runoff
- respiration**
  - DEF The interchange of gases of living organisms and the gases of the medium in which they live. Used for apnea and inhalation.
  - UF *apnea*
    - inhalation*
  - GS **respiration**
    - . high altitude breathing
    - . liquid breathing
    - . pressure breathing
  - RT alveoli
    - asphyxia
  - ∞ breathing
    - expiration
    - expired air
    - hydrogen metabolism
    - metabolism
    - oxygen metabolism
    - photosynthesis
    - physiology
    - plant physiology
    - respirators
    - respiratory system

## respirators

resuscitation  
sinuses  
Valsalva exercise

### respirators

GS medical equipment  
. **respirators**  
RT breathing apparatus  
emergency breathing techniques  
respiration  
resuscitation  
therapy

### respiratory diseases

GS diseases  
. **respiratory diseases**  
.. aerosinusitis  
.. asthma  
.. emphysema  
.. influenza  
.. pneumonia  
.. tuberculosis  
RT beryllium poisoning  
congestion  
fungal diseases  
lung morphology  
pulmonary lesions

### respiratory impedance

GS impedance  
. **respiratory impedance**

### respiratory physiology

GS physiology  
. **respiratory physiology**  
RT exercise physiology  
∞ science

### respiratory rate

GS rates (per time)  
. **respiratory rate**  
.. dyspnea  
.. hypoventilation  
.. tachypnea  
RT hypercapnia  
hyperpnea  
spirometers

### respiratory reflexes

GS reflexes  
. **respiratory reflexes**  
.. cough  
.. Hering-Breuer reflex  
.. sneezing  
RT ∞ breathing

### respiratory system

GS anatomy  
. **respiratory system**  
.. bronchi  
.. diaphragm (anatomy)  
.. larynx  
.. . glottis  
.. . vocal cords  
.. lungs  
.. alveoli  
.. nose (anatomy)  
.. paranasal sinuses  
.. pharynx  
.. trachea  
RT evaporation  
homeostasis  
hypercapnia  
organs  
pleurae  
pulmonary circulation  
respiration  
∞ systems

### respirometers

GS measuring instruments  
. **respirometers**  
RT bioinstrumentation  
exhalation

### responders

USE **transponders**

### response bias

GS bias

### . response bias

RT dynamic response  
errors  
∞ time response  
transient response

### response time (computers)

GS time  
. **response time (computers)**  
RT computer programming  
computer systems performance  
data processing  
parallel processing (computers)

### responses

DEF Of devices or systems, the motions (or other output) resulting from excitation under specified conditions.

GS **responses**  
.. dynamic response  
.. . transient response  
.. frequency response  
.. galvanic skin response  
.. modal response  
.. physiological responses  
.. . hemodynamic responses

RT chronaxy  
learning  
refractory period  
∞ thresholds  
time lag  
∞ time response

### rest

GS **rest**  
.. bed rest  
RT prone position  
recreation  
sitting position  
sleep  
supine position

### restartable rocket engines

GS engines  
.. rocket engines  
.. . **restartable rocket engines**  
RT ducted rocket engines  
electric rocket engines  
electrostatic engines  
electrothermal engines  
hybrid propellant rocket engines  
ion engines  
liquid propellant rocket engines  
nuclear rocket engines  
retrorocket engines  
solid propellant rocket engines  
sustainer rocket engines  
turborocket engines  
Vernier engines

### restoration

RT addition  
reconstruction

### restraints

USE **constraints**

### restrictions

USE **constrictions**

### resultants

DEF The sums of two or more vectors.  
RT vector analysis

### resuscitation

UF *artificial respiration*  
RT emergency breathing techniques  
first aid  
liquid breathing  
respiration  
respirators

### retaining

RT asteroid capture  
constraints  
containment  
∞ holding  
∞ joining  
locking  
∞ retention

sealing  
∞ storage

### retardants

GS **retardants**  
. flame retardants  
RT accelerating agents  
additives  
antiicing additives  
antiknock additives  
antioxidants  
catalysts  
explosion suppression  
inhibitors  
neutralizers  
penetrants  
preservatives  
∞ retarders  
retarding  
stabilizers (agents)  
suppressors  
surfactants  
wear inhibitors

### ∞ retarders

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT retardants  
retarders (devices)

### retarders (devices)

RT blocking  
brakes (for arresting motion)  
braking  
constrictions  
∞ retarders  
retarding

### retarding

UF *suppression*  
RT attenuation  
blocking  
braking  
damping  
deceleration  
fouling  
hysteresis  
prevention  
∞ reduction  
∞ resistance  
retardants  
retarders (devices)  
stopping

*retarding ion mass spectrometers*

USE **mass spectrometers**

### ∞ retention

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT retaining  
retention (psychology)

### retention (psychology)

RT learning  
memory  
∞ retention

### reticles

DEF Systems of lines or wires placed in the focal plane of an optical instrument to serve as a reference. Also called a reticule.

GS **reticles**  
. wire grid lenses  
RT contact lenses  
eyepieces  
∞ grids  
lenses  
optical equipment  
scale (ratio)

### reticulocytes

GS cells (biology)  
. blood cells  
.. erythrocytes  
.. . **reticulocytes**  
RT hematology  
hemoglobin  
hemolysis

- hemorrhages
- retina**
  - GS anatomy
    - . sense organs
    - . . eye (anatomy)
    - . . . **retina**
    - . . . . fovea
  - RT electroretinography
    - phosphene
    - photoreceptors
    - vision
    - visual fields
    - visual pigments
- retinal adaptation**
  - GS adaptation
    - . **retinal adaptation**
    - . . dark adaptation
    - . . light adaptation
  - RT perception
    - visibility
    - vision
- retinal images**
  - GS images
    - . **retinal images**
  - RT vision
    - visual fields
- retinene**
  - UF *vitamin A*
  - GS organic compounds
    - . cyclic compounds
    - . . heterocyclic compounds
    - . . . **retinene**
    - . lipids
    - . . **retinene**
    - vitamins
      - . **retinene**
  - RT aldehydes
    - carotene
- retirement**
  - RT employee relations
    - industries
    - personnel
    - sociology
- retirement for cause**
  - DEF Procedure, primarily on aircraft, based on fracture mechanics, which allows safe utilization of the full life capacities of each component.
  - RT component reliability
    - engine parts
    - fatigue life
    - fracture strength
    - inventory management
    - life (durability)
    - metal fatigue
    - service life
    - spare parts
- RETORC (torpedoes)**
  - USE **torpedoes**
- retort processing**
  - DEF One method for converting shale oil into oil similar to petroleum oils.
  - RT fractionation
    - hydrocarbon fuels
    - oils
  - ∞ processing
    - shale oil
- retractable equipment**
  - UF *retractable landing gear*
  - RT aerodynamic brakes
    - landing gear
    - refueling
- retractable landing gear**
  - USE **landing gear**
    - retractable equipment**
- retraining**
  - UF *reorientation*
  - RT adaptation
    - education
    - management methods
    - manpower
- personnel
  - tasks
  - training analysis
- retrieval**
  - GS **retrieval**
    - . data retrieval
    - . information retrieval
    - . payload retrieval (STS)
  - RT ∞ recovery
    - searching
- retroaction**
  - USE **retrothrust**
- retrofiring**
  - GS firing (igniting)
    - . rocket firing
    - . . **retrofiring**
  - RT deceleration
    - retrorocket engines
    - retrothrust
- retrofitting**
  - DEF Modification of equipment to incorporate changes made in later production of similar equipment; the changes may be performed in the factory or in the field.
  - GS **retrofitting**
    - . acoustic retrofitting
  - RT installing
- retrograde orbits**
  - (added June 1995)
  - DEF Motion in an orbit opposite to the usual orbital direction of celestial bodies within a given system. Specifically, of a satellite, motion in a direction opposite to the direction of rotation of the primary.
  - GS orbits
    - . **retrograde orbits**
  - RT interacting galaxies
    - orbital mechanics
    - planetary orbits
    - precession
    - satellite orbits
    - spacecraft orbits
    - stellar orbits
    - three body problem
- retroreflection**
  - DEF Reflection wherein the reflected rays return along paths parallel to those of their corresponding incident rays. Also called retroflection.
  - GS reflection
    - . **retroreflection**
  - RT antenna arrays
    - incident radiation
    - LAGEOS (satellite)
    - laser ranging
    - lunar retroreflectors
    - reflected waves
    - retroreflectors
    - satellite laser ranging
- retroreflectors**
  - DEF Class of optical instruments which cause reflected radiation to return along paths parallel to those of their corresponding incident rays.
  - GS radar equipment
    - . **retroreflectors**
    - reflectors
    - . **retroreflectors**
  - RT laser ranging
    - radar corner reflectors
    - retroreflection
    - satellite laser ranging
- retrorocket engines**
  - DEF Rocket engines fitted on or in spacecraft, satellites, or the like to produce thrust opposed to forward motion.
  - GS engines
    - . rocket engines
    - . . **retrorocket engines**
    - . . . BE-3 engine
  - RT control rockets
    - internal combustion engines
- liquid propellant rocket engines
  - man operated propulsion systems
  - restartable rocket engines
  - retrofiring
  - retrothrust
  - solid propellant rocket engines
- retrothrust**
  - DEF Thrust used for a braking maneuver; reverse thrust. Used for retroaction.
  - UF *retroaction*
  - GS thrust
    - . rocket thrust
    - . . **retrothrust**
  - RT deceleration
    - retrofiring
    - retrorocket engines
- return beam vidicons**
  - GS electron tubes
    - . camera tubes
    - . . vidicons
    - . . . **return beam vidicons**
    - . . . . thermicons
  - RT television cameras
- return to Earth space flight**
  - GS space flight
    - . **return to Earth space flight**
  - RT Assured Crew Return Vehicle
    - interplanetary flight
    - manned Mars missions
    - Mars missions
    - spacecraft reentry
    - X-38 crew return vehicle
- reusable heat shielding**
  - GS shielding
    - . heat shielding
    - . . **reusable heat shielding**
  - RT cooling
    - heat transfer
    - reentry shielding
    - spacecraft shielding
    - temperature control
    - thermal control coatings
    - thermal protection
- reusable launch vehicles**
  - GS launch vehicles
    - . **reusable launch vehicles**
    - . . single stage to orbit vehicles
    - . . . Delta Clipper
    - . . . HOTOL launch vehicle
    - . . X-33 reusable launch vehicle
    - . . X-34 reusable launch vehicle
  - RT Advanced Launch System (STS)
    - Aeromaneuvering Orbit to Orbit Shuttle
    - recoverable launch vehicles
    - rocket engines
    - spacecraft launching
    - spacecraft recovery
  - ∞ vehicles
    - X-37 vehicle
    - X-40A vehicle
- reusable rocket engines**
  - GS engines
    - . rocket engines
    - . . **reusable rocket engines**
  - RT oxygen-hydrocarbon rocket engines
- reusable spacecraft**
  - GS reentry vehicles
    - . recoverable spacecraft
    - . . **reusable spacecraft**
    - . . . aerospace planes
    - . . . . HOPE aerospace plane
    - . . . . HOTOL launch vehicle
    - . . . . VentureStar launch vehicle
    - . . . . X-30 vehicle
    - . . . . X-37 vehicle
    - . . . . X-40A vehicle
    - . . . MARS (Manned Reusable Spacecraft)
    - . . . single stage to orbit vehicles
    - . . . . Delta Clipper
    - . . . . HOTOL launch vehicle
    - . . . space shuttles

## reuse

- . . . . Buran space shuttle
- . . . . Hermes manned spaceplane
- . . . . Space Shuttle orbiters
- . . . . Atlantis (orbiter)
- . . . . Challenger (Orbiter)
- . . . . Columbia (Orbiter)
- . . . . Discovery (Orbiter)
- . . . . Endeavour (orbiter)
- . . . . Enterprise (Orbiter)
- RT expendable stages (spacecraft)
- ferry spacecraft
- Inertial Upper Stage
- interim stages (spacecraft)
- interplanetary spacecraft
- landing modules
- lunar landing modules
- manned spacecraft
- Saenger space transportation system
- soft landing spacecraft
- Space Shuttle Boosters
- unmanned spacecraft
- X-33 reusable launch vehicle
- X-34 reusable launch vehicle

## reuse

- GS utilization
- . reuse
- . . software reuse
- RT oil recovery
- ∞ recovery

## revenue

- RT allocations
- assessments
- budgeting
- costs
- international trade

## reverberation

DEF The persistence of sound in an enclosed space, as a result of multiple reflections, after the sound source has stopped. The sound that persists in an enclosed space, as a result of repeated reflection or scattering after the source of the sound has stopped.

- GS acoustic properties
- . acoustic scattering
- . . reverberation
- scattering
- . wave scattering
- . . acoustic scattering
- . . . reverberation

- RT echoes
- noise (sound)
- reverberation chambers
- sound waves

## reverberation chambers

DEF Chambers designed to eliminate outside noise for accurate acoustic measurement.

- GS compartments
- . test chambers
- . . reverberation chambers
- test facilities
- . reverberation chambers

- RT acoustic measurement
- acoustic simulation
- ∞ chambers
- environmental tests
- reverberation

## reverse engineering

(added May 1992)

- RT computer programming
- design analysis
- reversing
- software development tools
- software engineering
- systems engineering

## reverse field pinch

DEF A method of plasma confinement under investigation as part of the mirror and pinch programs.

- GS pinch effect
- . reverse field pinch
- RT magnetohydrodynamic flow
- plasma control
- reactor technology
- screw pinch

toroidal plasmas

## reverse osmosis

DEF The application of pressure to stop or reverse the transport of solvent through a semi-permeable membrane separating two solutions of different solute concentration. The applied pressure required to prevent the flow of solvent across a perfectly semipermeable membrane is called the osmotic pressure and is a characteristic of the solution.

- GS osmosis
- . reverse osmosis
- RT demineralizing
- desalination
- membranes
- permeating

## reverse time

USE reaction time

## reversed flow

- GS fluid flow
- . reversed flow
- RT boundary layer separation
- recirculative fluid flow
- reversing
- separated flow

## reversing

- RT ∞ direction
- reverse engineering
- reversed flow

## reviewing

- RT ∞ discussion
- evaluation
- examination
- training evaluation

## revisions

- UF alteration
- modification
- RT adjusting
- contracts
- correction
- extensions
- variations

## revolution (motion)

USE revolving

## revolving

DEF Moving in a path about an axis, usually external to the body accomplishing the motion. Used for revolution (motion).

- UF revolution (motion)
- GS gyration
- . revolving
- RT angular velocity
- centripetal force
- rotation

## reward (psychology)

- GS reinforcement (psychology)
- . reward (psychology)
- RT comfort
- human reactions
- psychological factors

## Reynolds averaging

(added October 1997)

- GS analysis (mathematics)
- . numerical analysis
- . . approximation
- . . . Reynolds averaging
- RT average
- boundary layer equations
- computational fluid dynamics
- flow equations
- large eddy simulation
- Navier-Stokes equation
- Reynolds stress
- turbulence models

## Reynolds equation

- UF Reynolds law
- GS equations of motion
- . Reynolds equation
- flow equations
- . Reynolds equation

- RT aerodynamic configurations
- ∞ equations
- Navier-Stokes equation
- scale models

## Reynolds law

USE Reynolds equation

## Reynolds number

DEF A nondimensional parameter representing the ratio of the momentum forces to the viscous forces in fluid flow. (After Osborne Reynolds, 1842-1912, English scientist). Used for critical Reynolds number.

- UF critical Reynolds number
- GS dimensionless numbers
- . Reynolds number
- . . high Reynolds number
- . . low Reynolds number
- ratios

- . Reynolds number
- . . high Reynolds number
- . . low Reynolds number

- RT boundary layer flow
- boundary layer stability
- boundary layer transition
- critical velocity
- fluid flow
- Froude number
- Grashof number
- inviscid flow
- laminar flow
- Peclet number
- Prandtl number
- Richardson number
- scale effect
- transition points
- turbulent flow
- viscous flow

## Reynolds stress

DEF In the mathematical treatment of a viscous, incompressible, homogeneous fluid in turbulent motion, that represents the transfer of momentum due to turbulent fluctuations.

- GS stresses
- . Reynolds stress
- RT incompressible flow
- Navier-Stokes equation
- Reynolds averaging
- turbulent boundary layer
- turbulent flow

## RF-4 aircraft

USE F-4 aircraft

## RF-8 aircraft

USE F-8 aircraft

## RFI (composite materials)

(added August 1997)

USE resin film infusion

## RH-2 helicopter

USE UH-1 helicopter

## Rhea (astronomy)

DEF A natural satellite of the planet Saturn orbiting at a mean distance of 527,000 kilometers.

- GS celestial bodies
- . natural satellites
- . . icy satellites
- . . . Rhea (astronomy)
- . . Saturn satellites
- . . . Rhea (astronomy)
- RT Saturn (planet)
- solar system

## rhenium

- GS chemical elements
- . rhenium
- . . rhenium isotopes
- metals
- . refractory metals
- . . rhenium
- . . . rhenium isotopes
- . transition metals
- . . rhenium
- . . . rhenium isotopes

refractory materials  
 . refractory metals  
 . . **rhodium**  
 . . . rhodium isotopes

**rhodium alloys**  
 GS alloys  
 . heat resistant alloys  
 . . refractory metal alloys  
 . . . **rhodium alloys**  
 refractory materials  
 . refractory metal alloys  
 . . **rhodium alloys**

**rhodium compounds**  
 RT ∞ chemical compounds  
 ∞ Group 7B compounds  
 ∞ metal compounds

**rhodium isotopes**  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **rhodium isotopes**  
 . rhodium  
 . . **rhodium isotopes**  
 metals  
 . refractory metals  
 . . rhodium  
 . . . **rhodium isotopes**  
 . transition metals  
 . . rhodium  
 . . . **rhodium isotopes**  
 refractory materials  
 . refractory metals  
 . . rhodium  
 . . . **rhodium isotopes**  
 RT radioactive isotopes

**rheocasting**  
 DEF Use of partially solidified metal alloys (fractions solids) fed directly into a casting machine for forming into machine parts.  
 GS forming techniques  
 . casting  
 . . **rheocasting**  
 RT alloys  
 cast alloys  
 dies  
 forging  
 slurries  
 solidification

**rheoelectrical simulation**  
 GS simulation  
 . **rheoelectrical simulation**  
 RT analog circuits  
 analog simulation  
 bionics  
 flow distribution

**rheoencephalography**  
 RT blood circulation  
 brain  
 brain circulation

**rheology**  
 DEF The study of the deformation and flow of matter.  
 RT electrorheological fluids  
 flow measurement  
 flow theory  
 ∞ fluids  
 liquid flow  
 magnetorheological fluids  
 Maxwell fluids  
 nonNewtonian fluids  
 plastic flow  
 plastic properties  
 shear thinning  
 viscosity

**rheometers**  
 GS measuring instruments  
 . flowmeters  
 . . **rheometers**  
 RT blood circulation

**Rhesus factor**  
 RT antigens

blood  
 congenital anomalies

**rheumatic diseases**  
 GS diseases  
 . **rheumatic diseases**  
 RT arthritis

**rhizopus**  
 GS plants (botany)  
 . fungi  
 . . **rhizopus**  
 RT blight  
 ∞ mold

**rhodamine**  
 (added July 1988)  
 GS dyes  
 . **rhodamine**  
 organic compounds  
 . cyclic compounds  
 . . **rhodamine**  
 RT amines  
 dye lasers  
 fluorescence  
 laser materials

**Rhode Island**  
 GS nations  
 . United States  
 . . **Rhode Island**  
 RT Block Island Sound (RI)

*Rhodesia*  
 USE **Zimbabwe**

**rhodium**  
 GS chemical elements  
 . **rhodium**  
 . . rhodium isotopes  
 metals  
 . transition metals  
 . . **rhodium**  
 . . . rhodium isotopes

*rhodium 102*  
 USE **rhodium isotopes**

*rhodium 106*  
 USE **rhodium isotopes**

**rhodium alloys**  
 GS alloys  
 . **rhodium alloys**  
 RT platinum alloys

**rhodium compounds**  
 RT ∞ chemical compounds  
 ∞ Group 8 compounds

**rhodium isotopes**  
 UF *rhodium 102*  
*rhodium 106*  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **rhodium isotopes**  
 . rhodium  
 . . **rhodium isotopes**  
 metals  
 . transition metals  
 . . rhodium  
 . . . **rhodium isotopes**

**rhombic antennas**  
 DEF Antennas composed of long wire radiators comprising the sides of a rhombus. The antenna usually is terminated in an impedance. The sides of the rhombus, the angle between the sides, the elevation, and the termination are proportioned to give the desired directivity.  
 GS antennas  
 . directional antennas  
 . . **rhombic antennas**  
 RT antenna design  
 radio antennas

**rhombohedrons**  
 GS geometry  
 . Euclidean geometry  
 . . polyhedrons

. . . **rhombohedrons**

**rhomboids**  
 DEF Parallelograms whose adjacent sides are not equal.  
 GS geometry  
 . Euclidean geometry  
 . . polygons  
 . . . tetragons  
 . . . . parallelograms  
 . . . . . **rhomboids**

**rho-mesons**  
 GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . vector mesons  
 . . . . . **rho-mesons**  
 . . fermions  
 . . . baryons  
 . . . . **rho-mesons**  
 . . hadrons  
 . . . baryons  
 . . . . **rho-mesons**  
 . . mesons  
 . . . . vector mesons  
 . . . . . **rho-mesons**  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . vector mesons  
 . . . . . **rho-mesons**  
 RT charged particles  
 eta-mesons

**Rhone Delta (France)**  
 GS landforms  
 . deltas  
 . . **Rhone Delta (France)**  
 RT France  
 Mediterranean Sea  
 rivers

**rhyolite**  
 GS rocks  
 . igneous rocks  
 . . **rhyolite**  
 RT lava  
 magma  
 silicon dioxide

∞ **rhythm**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT oscillations  
 periodic variations  
 rhythm (biology)

**rhythm (biology)**  
 UF *biological clocks*  
*biological rhythm*  
*biorhythms*  
*chronobiology*  
*periodicity (biology)*  
 GS **rhythm (biology)**  
 . circadian rhythms  
 RT activity cycles (biology)  
 alternations  
 ∞ biology  
 cycles  
 desynchronization (biology)  
 jet lag  
 phenology  
 ∞ rhythm  
 zeitgebers

**ribbon parachutes**  
 DEF Parachutes having a canopy consisting of an arrangement of closely spaced tapes. These parachutes have high porosity with attendant stability and slight opening shock.  
 GS parachutes  
 . **ribbon parachutes**  
 RT drag chutes  
 recovery parachutes

**ribbons**  
 RT conveyors  
 fabrics

**riblets**

- fasteners
- metal strips
- ∞ strip
- ∞ tapes

**riblets**

(added October 1988)

DEF Longitudinal striations forming V-shaped grooves on aerodynamic and hydrodynamic surfaces. The riblet devices act to reduce large-scale disturbances near the boundary layer. These grooves are dimensional on the order of the wall vortices and turbulent dimensions.

- GS grooves
  - . V grooves
  - . . **riblets**
- RT boundary layer control
  - drag reduction
  - friction drag
  - shear layers
  - skin friction
  - striation
  - turbulent boundary layer
  - vortex alleviation

**riboflavin**

- UF *vitamin B 2*  
*vitamin G*
- GS organic compounds
  - . cyclic compounds
  - . . heterocyclic compounds
  - . . . **riboflavin**
  - vitamins
  - . **riboflavin**

**ribonucleic acids**

DEF A chemical found in the nucleus and cytoplasm of cells. It plays an important role in protein synthesis and other chemical activities of the cell. Used for RNA, messenger RNA, transfer RNA, and ribosomal RNA.

- UF *messenger RNA*  
*ribosomal RNA*  
*transfer RNA*
- GS acids
  - . nucleic acids
  - . . **ribonucleic acids**
  - biopolymers
  - . nucleic acids
  - . . **ribonucleic acids**
  - organic compounds
  - . nucleic acids
  - . . **ribonucleic acids**
- RT adenines
  - gene expression
  - genes
  - genome
  - guanosines
  - polynucleotides
  - ribosomes
  - transcription (genetics)

**ribose**

- GS organic compounds
  - . carbohydrates
  - . . sugars
  - . . . monosaccharides
  - . . . . pentose
  - . . . . . **ribose**
- RT nucleosides

*ribosomal RNA*

USE **ribonucleic acids**

**ribosomes**

(added August 2004)

DEF A class of multi-component structures found in all cells, in mitochondria, and chloroplasts. They have roles both in genetic translation of transcripts and in the manufacture and secretion of the proteins.

- GS organelles
  - . **ribosomes**
- RT cells (biology)
  - cytoplasm
  - ribonucleic acids

**ribs (supports)**

- RT longerons

- reinforcement (structures)
- reinforcement rings
- stiffening
- webs (supports)

**Riccati equation**

- GS algebra
  - . linear equations
  - . . **Riccati equation**
  - analysis (mathematics)
  - . real variables
  - . . differential equations
  - . . . **Riccati equation**
  - . . linear equations
  - . . . **Riccati equation**

**rice**

- GS farm crops
  - . grains (food)
  - . . **rice**
  - plants (botany)
  - . **rice**
- RT wheat

**Richards theorem**

- GS theorems
  - . **Richards theorem**
- RT network synthesis
  - signal flow graphs

**Richardson number**

DEF A nondimensional number arising in the study of shearing flows of a stratified fluid.

- GS dimensionless numbers
  - . **Richardson number**
  - ratios
  - . **Richardson number**
- RT aerodynamic stability
  - Reynolds number
  - shear flow

*Richardson-Dushman equation*

USE **temperature effects**  
**thermionic emission**

∞ **ridges**

- SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))
- UF *cuestas*  
*hogbacks*
- RT bridges (landforms)
  - buckling
  - corrugating
  - gaps (geology)
  - karst
  - landforms
  - mid-ocean ridges
  - mountains
  - protuberances
  - wrinkling

**riding quality**

- GS quality
  - . **riding quality**
- RT comfort
  - passengers
  - seats
  - suspension systems (vehicles)
  - transportation

*Riemann integral*

USE **measure and integration**

**Riemann manifold**

- UF *Riemann space*  
*Riemann sphere*
- GS geometry
  - . differential geometry
  - . . **Riemann manifold**
  - manifolds (mathematics)
  - . **Riemann manifold**

- RT Euclidean geometry

*Riemann problem*

USE **Cauchy problem**

*Riemann space*

USE **Riemann manifold**

*Riemann sphere*

USE **Riemann manifold**

**Riemann waves**

- GS elastic waves
  - . shock waves
  - . . **Riemann waves**
- RT blast loads
  - differential equations
  - dynamic pressure
  - explosions
  - hyperbolic functions

**Riesz theorem**

- GS theorems
  - . **Riesz theorem**
- RT differential equations
  - hyperbolic functions

**rifles**

- GS weapons
  - . guns (ordnance)
  - . . **rifles**
- RT artillery

**RIFT (reactor in flight test)**

- UF *reactor in flight test program*
- RT electric propulsion
  - ∞ reactors
  - rocket engines
  - Rover project
  - Saturn project

*rift valleys*

USE **valleys**

*rifts*

USE **geological faults**

**rigging**

- RT assembling
  - construction
- ∞ equipment
  - materials handling
  - shrouds

*rigid bodies*

USE **rigid structures**

**rigid mounting**

- GS mounting
  - . **rigid mounting**
- RT pylon mounting

**rigid rotor helicopters**

- GS V/STOL aircraft
  - . rotary wing aircraft
  - . . helicopters
  - . . . **rigid rotor helicopters**
  - . . . . CH-3 helicopter
  - . . . . F-28 helicopter
  - . . . . XH-51 helicopter
- RT ∞ aircraft
  - OH-5 helicopter

**rigid rotors**

- UF *hingeless rotors*
- GS airfoils
  - . wings
  - . . rotary wings
  - . . . **rigid rotors**
  - rigid structures
  - . **rigid rotors**
  - rotating bodies
  - . rotors
  - . . rotary wings
  - . . . **rigid rotors**
- RT bearingless rotors

**rigid rotors (plasma physics)**

DEF Ensembles of electrons moving in cir-

cular or nearly circular orbits at a constant angular frequency.

- GS **rigid rotors (plasma physics)**
  - . plasma physics
- RT molecular collisions
- ∞ molecular rotation
- ∞ physics
- plasma control

**rigid structures**

- UF *inelastic bodies*  
*rigid bodies*  
*stiff structures*
- GS **rigid structures**
  - . rigid rotors
  - . rigid wings
- RT arches
  - composite materials
  - concrete structures
  - Euler equations of motion
  - hybrid structures
  - plastic bodies
  - reinforcement (structures)
  - sandwich structures
  - space erectable structures
  - steel structures
- ∞ structures
  - translational motion
  - welded structures

**rigid wings**

- SN (EXCLUDES 'RIGID ROTORS')
- GS airfoils
  - . wings
  - . . **rigid wings**
- rigid structures
  - . **rigid wings**
- RT aeroelasticity
  - fixed wings
  - flexible wings
  - low aspect ratio wings

∞ **rigidity**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT flexibility
  - magnetic rigidity
  - mechanical properties
  - modulus of elasticity
  - ruggedness
  - stiffness
  - structural stability

*rills*

USE **valleys**

**rim**

- RT ∞ blades
- borders
- edges
- margins
- sides

**ring currents**

- GS electric current
  - . **ring currents**
- RT atmospheric electricity
  - electrojets
  - plasma currents

**ring discharge**

- GS electric current
  - . electric discharges
  - . . Townsend discharge
  - . . . gas discharges
  - . . . . toroidal discharge
  - . . . . . **ring discharge**
- RT ∞ discharge
  - electrodeless discharges
  - gas ionization
  - high frequencies
  - radio frequency discharge

**ring galaxies**

- (added November 1988)
- GS celestial bodies
  - . galaxies
  - . . **ring galaxies**
- RT elliptical galaxies
- galactic evolution

galactic structure  
interacting galaxies  
spiral galaxies

**ring lasers**

- GS stimulated emission devices
  - . lasers
  - . . **ring lasers**

**ring structures**

- GS **ring structures**
  - . reinforcement rings
  - . ring wings
- RT aerodynamic configurations
  - ∞ bands
  - hoops
  - reinforcement (structures)
  - ∞ rings
  - ∞ structures

**ring wings**

- GS airfoils
  - . wings
  - . . uncambered wings
  - . . . **ring wings**
  - . . . unswept wings
  - . . . . **ring wings**
- ring structures
  - . **ring wings**
- RT ducted fans
  - shrouded propellers
  - twisted wings

**Ringleb flow**

- (added July 1998)
- GS fluid flow
  - . compressible flow
  - . . **Ringleb flow**
  - . . steady flow
  - . . . **Ringleb flow**
  - . . . two dimensional flow
  - . . . . **Ringleb flow**
- RT critical flow
  - subsonic flow
  - transonic flow

∞ **rings**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT annuli
  - bodies of revolution
  - circles (geometry)
  - Jupiter rings
  - O ring seals
  - planetary rings
  - reinforcement rings
  - ring structures
  - rings (mathematics)
  - Saturn rings
  - storage rings (particle accelerators)
  - toroidal plasmas
  - toruses
  - Uranus rings
  - vortex rings

**rings (mathematics)**

- RT ∞ mathematics
- ∞ rings

**Rio Grande (North America)**

- GS rivers
  - . **Rio Grande (North America)**
- RT Gulf of Mexico
  - Mexico
  - New Mexico
  - texas

**riometers**

- GS measuring instruments
  - . radiation measuring instruments
  - . . **riometers**
- RT atmospheric ionization
  - auroral absorption
  - ionograms
  - ionosondes
  - ionospheric noise
  - ionospheric propagation

**ripples**

- GS elastic waves

- . capillary waves
- . . **ripples**
- surface waves
  - . capillary waves
  - . . **ripples**
- RT gravity waves
  - interfacial tension
  - water waves
  - wind (meteorology)

**RISC processors**

- (added March 1995)
- DEF A type of computer processor designed to optimize total system performance by simple, fast decoding of the instructions most commonly employed in computer operations and characterized by: a simple instruction set with the majority of instructions being single cycle; instructions that are register-to-register with LOAD and STORE commands being the only memory-reference instructions; very few addressing modes; hardwired control; instructions with one or two sizes and with fields at fixed locations; and some degree of pipelining.
- UF *reduced instruction set computing*
- GS computer components
  - . central processing units
  - . . **RISC processors**
- RT architecture (computers)
  - chips (electronics)
  - computer programming
  - computer systems performance
  - firmware
  - pipelining (computers)
  - systems-on-a-chip
  - very large scale integration

**risers**

- RT castings
- pipes (tubes)

**risk**

- DEF The combined effect of the likelihood of an unfavorable occurrence and the potential impact of that occurrence.
- RT acceptability
  - assumptions
- ∞ capacity
  - commerce
  - confidence
  - confidence limits
  - contingency
  - decision theory
  - estimates
  - estimating
  - finance
  - forecasting
  - game theory
  - hazards
  - inventory controls
  - mathematical models
  - maximum likelihood estimates
  - operations research
  - predictions
  - reliability
  - risk assessment
  - strategy

**risk assessment**

- (added March 2008)
- DEF The identification, evaluation, and estimation of the levels of risks involved in a situation, their comparison against benchmarks or standards, and determination of an acceptable level of risk.
- GS assessments
  - . **risk assessment**
- RT decision making
  - evaluation
  - failure analysis
  - hazards
  - predictions
  - risk
  - risk management

**risk management**

- (added April 2008)
- DEF An organized, systematic process that identifies, analyzes, tracks, controls, communicates and documents risks to increase the like-



## RIT engines

likelihood of achieving success.

- GS management
  - . **risk management**
- RT accident prevention
  - decision making
  - project planning
  - risk assessment
  - safety management

### RIT engines

DEF Radio frequency ion thrusters which generate thrust by converting electric energy into a reaction force by utilizing an electromagnetic field. Used for radio frequency ion thruster engines.

- UF *radio frequency ion thruster engines*
- GS engines
  - . rocket engines
  - . . . electric rocket engines
  - . . . electrostatic engines
  - . . . . ion engines
  - . . . . . **RIT engines**
- RT plasma engines

### Ritz averaging method

- GS analysis (mathematics)
  - . numerical analysis
  - . . approximation
  - . . . **Ritz averaging method**
- RT  $\infty$  methodology

### river basins

- GS landforms
  - . structural basins
  - . . **river basins**
  - . . . Atchafalaya River Basin (LA)
  - . . . Chena River Basin (AK)
  - . . . Columbia River Basin (ID-OR-WA)
  - . . . Delaware River Basin (US)
  - . . . Feather River Basin (CA)
  - . . . Missouri River Basin (US)
  - . . . Susquehanna River Basin (MD-NY-PA)
  - . . . Wabash River Basin (IL-IN-OH)
  - . . . wadis
- RT Amazon region (South America)
  - Chesapeake Bay (US)
  - Death Valley (CA)
  - International Hydrological Decade lakes
  - meanders
  - Mississippi River (US)
  - Missouri River (US)
  - rapids
  - ravines
  - rivers
  - Sacramento Valley (CA)
  - Saginaw Bay (MI)
  - San Joaquin Valley (CA)
  - Shenandoah Valley (VA)
  - vadose water
  - watersheds

### rivers

DEF A general term for natural fresh water surface streams of considerable volume and permanent or seasonal flow, moving in definite channels toward seas, lakes, or other rivers. Rivers are large streams or ones larger than brooks or creeks, such as trunk systems and the larger branches of drainage systems.

- GS **rivers**
  - . Colorado River (North America)
  - . Hudson River (NY-NJ)
  - . Mississippi River (US)
  - . Missouri River (US)
  - . Ohio River (US)
  - . Rio Grande (North America)
- RT alluvium
  - Amazon region (South America)
  - Atchafalaya River Basin (LA)
  - aufeis (ice)
  - bayous
  - canyons
  - Columbia River Basin (ID-OR-WA)
  - Delaware River Basin (US)
  - deltas
  - Earth resources
  - erosion

estuaries

- Feather River Basin (CA)
- inland waters
- Lake Erie
- Lake Huron
- Lake Michigan
- Lake Ontario
- Lake Superior
- meanders
- Mississippi Delta (LA)
- Missouri River Basin (US)
- rapids
- reservoirs
- Rhone Delta (France)
- river basins
- shoals
- shorelines
- sounds (topographic features)
- streams
- surface water
- Susquehanna River Basin (MD-NY-PA)
- tributaries
- valleys
- Wabash River Basin (IL-IN-OH)
- wadis
- water color
- water runoff
- watersheds
- waterways
- wharves

### riveted joints

- GS joints (junctions)
  - . **riveted joints**
- RT bolted joints
  - butt joints
  - lap joints
  - metal joints
  - welded joints

### riveting

- RT  $\infty$  joining
  - rivets
  - sealing

### rivets

- GS fasteners
  - . **rivets**
- RT couplings
  - holders
  - pins
  - riveting

### RL circuits

- UF *LR circuits*
- GS circuits
  - . **RL circuits**
  - . . RLC circuits
- RT coupling circuits
  - electrical resistance
  - inductance
  - LC circuits
  - network analysis
  - network synthesis
  - time constant
  - transconductance

### RL-10 engines

- GS engines
  - . rocket engines
  - . . liquid propellant rocket engines
  - . . . **RL-10 engines**
  - . . . . RL-10-A-1 engine
  - . . . . . RL-10-A-3 engine
- RT Atlas Centaur launch vehicle
  - Centaur project
  - cryogenic rocket propellants
  - Saturn launch vehicles

### RL-10-A-1 engine

- GS engines
  - . rocket engines
  - . . liquid propellant rocket engines
  - . . . hydrogen oxygen engines
  - . . . . **RL-10-A-1 engine**
  - . . . . . RL-10 engines

. . . . **RL-10-A-1 engine**

### RL-10-A-3 engine

- GS engines
  - . rocket engines
  - . . liquid propellant rocket engines
  - . . . hydrogen oxygen engines
  - . . . . **RL-10-A-3 engine**
  - . . . . . RL-10 engines
  - . . . . . **RL-10-A-3 engine**
- RT Saturn D launch vehicle

### RLC circuits

- UF *LRC circuits*
  - . *RLC networks*
- GS circuits
  - . RL circuits
  - . . **RLC circuits**
- RT capacitance
  - capacitance switches
  - electrical resistance
  - LC circuits
  - network analysis
  - network synthesis
  - RC circuits
  - time constant
  - transconductance

*RLC networks*

USE **RLC circuits**

### roads

- GS **roads**
  - . highways
- RT  $\infty$  facilities
  - intersections
  - passageways
  - pavements
  - rapid transit systems
  - site selection
  - streets
  - transportation
  - transportation networks

### roadway powered vehicles

DEF Surface vehicles utilizing a combination of an electrical power source embedded in a roadway and an inductive coupled power pickup.

- GS surface vehicles
  - . **roadway powered vehicles**
- RT electric batteries
  - electric motor vehicles
  - energy storage

### roasting

- UF *calcination*
- RT baking
  - desulfurizing
  - drying
  - heating
  - ignition
  - oxidation
  - reduction (chemistry)
  - sintering

### ROBIN balloons

- GS expandable structures
  - . inflatable structures
  - . . balloons
  - . . . meteorological balloons
  - . . . . **ROBIN balloons**
- RT high altitude balloons
  - radiosondes
  - rockoons
  - skyhook balloons
  - sounding

### robot arms

- (*added January 1990*)
- UF *arms (robotics)*
- GS **robot arms**
  - . Space Station Mobile Servicing System
- RT electroactive polymers
  - end effectors
  - manipulators
  - robot dynamics
  - robotics

robots

**robot control**  
(added December 1990)  
RT adaptive control  
∞ control  
control systems design  
control theory  
dynamic control  
feedback control  
inverse kinematics  
robot dynamics  
robotics  
robots  
unmanned ground vehicles

**robot dynamics**  
(added January 1990)  
UF *robot motion*  
RT dynamic control  
∞ dynamics  
end effectors  
gait  
inverse kinematics  
manipulators  
robot arms  
robot control  
robotics  
telerobotics  
trajectory planning

*robot fingers*  
USE **end effectors**

*robot hands*  
USE **end effectors**

*robot motion*  
USE **robot dynamics**

**robot sensors**  
(added January 1990)  
GS **robot sensors**  
. tactile sensors (robotics)  
. torque sensors (robotics)  
RT acceleration measurement  
computer vision  
robotics  
robots  
∞ sensors

**robotics**  
DEF A discipline that employs the principles and techniques of mechanical and electrical engineering and artificial intelligence to develop programmable or self-controlled machines that often include sensory systems and a degree of intelligence.  
GS **robotics**  
. telerobotics  
RT artificial intelligence  
automata theory  
automatic control  
∞ automation  
computer aided design  
computer aided manufacturing  
computer aided mapping  
computer vision  
end effectors  
inverse kinematics  
man machine systems  
manipulators  
multisensor fusion  
position sensing  
robot arms  
robot control  
robot dynamics  
robot sensors  
robots  
task planning (robotics)  
teleoperators  
trajectory planning  
unmanned ground vehicles  
voice control

**robots**  
RT artificial intelligence  
automata theory  
bionics  
computer vision

end effectors  
psycholinguistics  
robot arms  
robot control  
robot sensors  
robotics  
servomechanisms  
Space Station Mobile Servicing System  
tactile sensors (robotics)  
task planning (robotics)  
telerobotics  
torque sensors (robotics)  
voice control

**robustness (mathematics)**  
DEF Insensitivity of systems to uncontrolled perturbations and independent of changes in environmental parameters as demonstrated mathematically.  
RT algorithms  
control stability  
control theory  
feedback control  
linear systems  
mathematical models

**Roche limit**  
GS range (extremes)  
. **Roche limit**  
RT celestial mechanics  
dimensional stability  
gravitation  
natural satellites  
orbits  
rotating bodies  
two body problem

**rock bolts**  
GS fasteners  
. bolts  
. . **rock bolts**

**rock intrusions**  
DEF Vertical tabular bodies of rock that fill fissures in host rocks. Used for dikes (geology).  
UF *dikes (geology)*  
GS **rock intrusions**  
. batholiths  
RT contacts (geology)  
igneous rocks  
inliers (landforms)  
regolith  
rocks  
veins (petrology)

**rock mechanics**  
DEF The theoretical and applied science of the physical behavior of rocks, representing a branch of mechanics concerned with the response of rock to the force fields of its physical environment.  
RT fracture mechanics  
geology  
rocks  
soil mechanics  
structural properties (geology)

*rock salt*  
USE **halites**

*rocket boosters*  
USE **booster rocket engines**

**rocket catapults**  
GS launchers  
. catapults  
. . **rocket catapults**  
. rocket launchers  
. . **rocket catapults**  
RT gun launchers  
launch vehicles  
launching sites  
missiles

∞ rockets

*rocket chambers*  
USE **thrust chambers**

**rocket engine 9KS-11000**  
GS engines  
. rocket engines  
. . booster rocket engines  
. . . **rocket engine 9KS-11000**

**rocket engine cases**  
UF *missile engine cases*  
*rocket motor cases*  
GS cases (containers)  
. **rocket engine cases**  
RT bonded joints  
missile bodies  
orthotropic cylinders  
perforated shells  
shells (structural forms)  
thrust chambers

**rocket engine control**  
GS engine control  
. **rocket engine control**  
RT attitude control  
automatic control  
∞ control  
directional control  
flight control  
fuel control  
HEUS rocket engines  
missile control  
remote control  
servocontrol  
spacecraft control  
thrust control

**rocket engine design**  
GS engine design  
. **rocket engine design**  
RT aerospike engines  
cold flow tests  
∞ design  
engine tests  
prefiring tests  
Rover project

**rocket engine noise**  
GS elastic waves  
. sound waves  
. . noise (sound)  
. . . engine noise  
. . . . **rocket engine noise**  
RT mufflers

**rocket engines**  
DEF Reaction engines that contain within themselves, or carry along with themselves, all the substances necessary for their operation or for the consumption or combustion of their fuel, not requiring of any outside substance and hence capable of operation in outer space. Used for interplanetary propulsion.  
UF *interplanetary propulsion*  
GS engines  
. **rocket engines**  
. . booster rocket engines  
. . . AJ-10 engine  
. . . Algol engine  
. . . apogee boost motors  
. . . H-1 engine  
. . . LR-87-AJ-5 engine  
. . . M-1 engine  
. . . M-55 engine  
. . . MA-2 engine  
. . . MA-3 engine  
. . . MA-5 engine  
. . . Nike booster rocket engines  
. . . P-1 engine  
. . . rocket engine 9KS-11000  
. . . Space Shuttle Boosters  
. . . Advanced Solid Rocket Motor (STS)  
. . . X-405 engine  
. . ducted rocket engines  
. . electric rocket engines  
. . . electrostatic engines  
. . . . ion engines

## rocket exhaust

- . . . . cesium engines
- . . . . Hall thrusters
- . . . . mercury ion engines
- . . . . RIT engines
- . . . electrothermal engines
- . . . . arc jet engines
- . . . . pulsed jet engines
- . . . . resistojet engines
- . . . plasma engines
- . . . . magnetoplasmadynamic thrusters
- . . . . pulsed inductive thrusters
- . . . . pulsed plasma thrusters
- . . . . two stage plasma engines
- . . . . VASIMR (propulsion system)
- . . HEUS rocket engines
- . . hot water rocket engines
- . . hybrid propellant rocket engines
- . . . lithergol rocket engines
- . . liquid propellant rocket engines
- . . . AJ-10 engine
- . . . F-1 rocket engine
- . . . H-1 engine
- . . . hydrazine engines
- . . . hydrogen oxygen engines
- . . . J-2 engine
- . . . M-1 engine
- . . . . RL-10-A-1 engine
- . . . . RL-10-A-3 engine
- . . liquid air cycle engines
- . . . LR-62-RM-2 engine
- . . . LR-87-AJ-5 engine
- . . . LR-91-AJ-5 engine
- . . . MA-2 engine
- . . . MA-3 engine
- . . . MA-5 engine
- . . . oxygen-hydrocarbon rocket engines
- . . . RL-10 engines
- . . . . RL-10-A-1 engine
- . . . . RL-10-A-3 engine
- . . . pulse detonation engines
- . . . Space Shuttle Main Engine
- . . . X-405 engine
- . . . XLR-99 engine
- . . . YLR-91-AJ-1 engine
- . . M-100 engine
- . . microrocket engines
- . . . Orbit Maneuvering Engine (Space Shuttle)
- . . nozzleless rocket engines
- . . nuclear engine for rocket vehicles
- . . nuclear ramjet engines
- . . nuclear rocket engines
- . . . nuclear lightbulb engines
- . . restartable rocket engines
- . . retrorocket engines
- . . . BE-3 engine
- . . reusable rocket engines
- . . solid propellant rocket engines
- . . . Algol engine
- . . . apogee boost motors
- . . ASROC engine
- . . Hercules engine
- . . . M-46 engine
- . . . M-55 engine
- . . . M-56 engine
- . . . M-57 engine
- . . Nike booster rocket engines
- . . . P-1 engine
- . . . SL-3 rocket engine
- . . . Space Shuttle Boosters
- . . . . Advanced Solid Rocket Motor (STS)
- . . . SYNCOM apogee engines
- . . . TX-77 engine
- . . . TX-354 engine
- . . . X-248 engine
- . . . X-254 engine
- . . . X-258 engines
- . . . . X-258-B1 engine
- . . . X-259 engine
- . . . XM-33 engine
- . . sustainer rocket engines
- . . turborocket engines
- . . ullage rocket engines
- . . upper stage rocket engines
- . . Vernier engines
- . . . control rockets

- . . . SYNCOM apogee engines
- . . . aerospike engines
- . . rocket-based combined-cycle engines

RT aircraft engines

- axial modes
- burning time
- dump combustors
- ejectors
- exhaust nozzles
- expendable stages (spacecraft)
- heavy lift launch vehicles
- hybrid propulsion
- ignition systems
- internal combustion engines
- jet engines
- jet propulsion
- laser propulsion
- launch vehicles
- Lunar Module Ascent Stage
- magnetoplasmadynamics
- matter-antimatter propulsion
- missile configurations
- missiles
- multistage rocket vehicles
- negative matter propulsion
- post boost propulsion system

∞ propellant actuated devices

- propellant explosions
- refractories
- reusable launch vehicles
- RIFT (reactor in flight test)

∞ rockets

- single stage rocket vehicles
- solid rocket propellants
- spacecraft components
- spacecraft propulsion
- spacecraft structures
- thrust
- thrust vector control

∞ thrusters

- thrust-weight ratio

### rocket exhaust

GS plumes

- . **rocket exhaust**

RT aerospike engines

- base heating
- combustion products
- exhaust clouds
- exhaust gases
- exhaust systems
- jet exhaust

### rocket firing

GS firing (igniting)

- . **rocket firing**
- . . retrofiring

RT burning time

- detonation
- liftoff (launching)
- static firing
- test firing

### rocket flight

RT climbing flight

- coasting flight

∞ flight

- flight paths
- horizontal flight
- hypersonic flight
- meteorological flight
- space flight
- suborbital flight
- supersonic flight
- trajectories
- transonic flight
- vertical flight

### rocket launchers

DEF Devices for launching rockets.

GS launchers

- . **rocket launchers**
- . . rocket catapults

RT ground support equipment

- gun launchers
- launch vehicles
- launching
- launching sites
- missile launchers

- ∞ rockets
- rockoons
- sea launching

### rocket launching

UF *blastoff*

GS launching

- . **rocket launching**
- . . liftoff (launching)
- . . lunar launch
- . . orbital launching

RT Delta 4 Heavy launch vehicle

- exhaust clouds
- launch vehicles
- launch windows
- launchers
- spacecraft launching

### rocket linings

DEF In solid rockets, the layers of inhibitors applied to the inner surface of the chamber holding the grain.

GS linings

- . **rocket linings**

RT bonded joints

- engine parts
- refractories

### rocket motor cases

USE **rocket engine cases**

### rocket nose cones

GS cones

- . nose cones
- . . **rocket nose cones**
- forebodies
- . noses (forebodies)
- . . nose cones
- . . . **rocket nose cones**

RT ablative nose cones

### rocket nozzles

DEF The exhaust nozzles of rockets.

GS **rocket nozzles**

- . dual thrust nozzles

RT aerospike engines

- annular nozzles
- carbon-phenolic composites
- conical nozzles
- convergent-divergent nozzles
- divergent nozzles
- hypersonic nozzles
- magnetic nozzles
- nozzle inserts
- nozzleless rocket engines

∞ nozzles

- plug nozzles
- skirts
- spike nozzles
- supersonic nozzles

### rocket oxidizers

UF *propellant oxidizers*

GS oxidizers

- . **rocket oxidizers**
- . . FLOX
- . . TAGN

RT cryogenic fluids

- Domino propellants
- high energy oxidizers
- hydrogen peroxide
- liquid oxidizers
- liquid oxygen
- nitrogen tetroxide
- nitronium perchlorate
- TATB
- tetrafluorohydrazine

### rocket planes

GS rocket vehicles

- . **rocket planes**
- . . X-1 aircraft
- . . X-2 aircraft
- . . X-15 aircraft

RT aerospace planes

∞ aircraft

- boostglide vehicles

research aircraft

*rocket propellant tanks*

USE **propellant tanks**

**rocket propellants**

DEF Agents used for consumption or combustion in rockets and from which the rockets derive their thrust, such as fuels, oxidizers, additives, catalysts or any compounds or mixtures of these. Used for multipropellants.

UF *multipropellants*

GS propellants

**. rocket propellants**

- . . . gaseous rocket propellants
- . . . liquid rocket propellants
- . . . . cryogenic rocket propellants
- . . . . gelled rocket propellants
- . . . . hypergolic rocket propellants
- . . . . monopropellants
- . . . . RP-1 rocket propellants
- . . . . slurry propellants
- . . . . slush hydrogen
- . . . . aeroxine
- . . . nitramine propellants
- . . . solid rocket propellants
- . . . . double base rocket propellants
- . . . . HMX
- . . . . HTPB propellants
- . . . . metal propellants
- . . . TAGN
- . . . TATB

RT ascent propulsion systems

auxiliary propulsion

fuels

hydrazines

hydrocarbon fuels

missiles

propellant binders

propellant consumption

propellant storage

propulsion

solid propellants

specific impulse

storable propellants

thrust

torpedo engines

**rocket propelled sleds**

GS surface vehicles

. sleds

**. . . rocket propelled sleds**

RT Javelin rocket vehicle

∞ test equipment

*rocket sondes*

USE **sounding rockets**

**rocket sounding**

GS sounding

**. rocket sounding**

RT acoustic sounding

atmospheric sounding

barium ion clouds

in situ measurement

ionospheric sounding

Judi-Dart rocket

microwave sounding

satellite sounding

sounding rockets

Vertikal rockets

**rocket test facilities**

GS test facilities

**. rocket test facilities**

RT engine tests

test firing

test ranges

test stands

**rocket thrust**

DEF The thrust of a rocket engine usually expressed in pounds.

GS thrust

**. rocket thrust**

. . . retrothrust

RT high thrust

jet thrust

liftoff (launching)

low thrust

low thrust propulsion

microthrust

propulsion system performance

specific impulse

static thrust

thrust loads

thrust termination

variable thrust

**rocket vehicles**

DEF Vehicles propelled by rocket engines, used to place satellites in orbit, place missiles on target or carry passengers over rails as on rocket sleds.

GS **rocket vehicles**

- . Arcon rocket vehicle
- . Blue Streak launch vehicle
- . Blue Streak missile
- . Centaur launch vehicle
- . . Atlas Centaur launch vehicle
- . Folding Fin aircraft rocket vehicle
- . hovering rocket vehicles
- . Meteor 1 rocket vehicle
- . multistage rocket vehicles
- . . Ablestar launch vehicle
- . . Antares rocket vehicle
- . . Argo rocket vehicles
- . . Astrobee rocket vehicles
- . . . Astrobee 1500 rocket vehicle
- . . Athena rocket vehicle
- . . Atlas launch vehicles
- . . . Atlas Able 5 launch vehicle
- . . . Atlas Agena B launch vehicle
- . . . Atlas Agena launch vehicles
- . . . Atlas Centaur launch vehicle
- . . . Atlas SLV-3 launch vehicle
- . . Berenice rocket vehicle
- . . Black Knight rocket vehicle
- . . Blue Scout rocket vehicle
- . . Diamant launch vehicle
- . . Eldo launch vehicle
- . . EXOS sounding rocket
- . . Jaguar rocket vehicle
- . . Javelin rocket vehicle
- . . Juno launch vehicles
- . . . Juno 1 launch vehicle
- . . . Juno 2 launch vehicle
- . . Jupiter C rocket vehicle
- . . Kappa rocket vehicles
- . . . Kappa 8 rocket vehicle
- . . . Kappa 9 rocket vehicle
- . . Lambda rocket vehicles
- . . Little Joe 2 launch vehicle
- . . Nike rocket vehicles
- . . . Nike-Apache rocket vehicle
- . . . Nike-Cajun rocket vehicle
- . . . Nike-Hydrac rocket vehicle
- . . . Nike-Iroquois rocket vehicle
- . . . Nike-Javelin rocket vehicle
- . . . Nike-Tomahawk rocket vehicle
- . . Nova launch vehicles
- . . Pegasus air-launched booster
- . . Phoenix sounding rocket
- . . RAM B launch vehicle
- . . Rubis rocket vehicle
- . . Saturn launch vehicles
- . . . Saturn 1 launch vehicles
- . . . . Saturn 1 SA-1 launch vehicle
- . . . . Saturn 1 SA-10 launch vehicle
- . . . . Saturn 1 SA-2 launch vehicle
- . . . . Saturn 1 SA-3 launch vehicle
- . . . . Saturn 1 SA-4 launch vehicle
- . . . . Saturn 1 SA-5 launch vehicle
- . . . . Saturn 1 SA-6 launch vehicle
- . . . . Saturn 1 SA-7 launch vehicle
- . . . . Saturn 1 SA-8 launch vehicle
- . . . . Saturn 1 SA-9 launch vehicle
- . . . Saturn 1B launch vehicles
- . . . Saturn 2 launch vehicles
- . . . Saturn 5 launch vehicles
- . . . Saturn D launch vehicle
- . . Scout launch vehicle
- . . Skylark rocket vehicle
- . . Thor launch vehicles
- . . . Thor Able rocket vehicle
- . . . Thor Agena launch vehicle
- . . . Thor Delta launch vehicle
- . . Titan launch vehicles
- . . . Titan 3 launch vehicle

- . . . Titan 4 launch vehicle
- . . . . Titan 4B launch vehicle
- . . Ares 1 launch vehicle
- . . vanguard 2 launch vehicle
- . . Vega launch vehicle
- . . WASP sounding rocket
- . . . Ares 1 first stage
- . . . Ares 1 upper stage
- . . Ares 5 cargo launch vehicle
- . payload assist module
- . rocket planes
- . . X-1 aircraft
- . . X-2 aircraft
- . . X-15 aircraft
- . Saturn stages
- . . Saturn S-1 stage
- . . Saturn S-1B stage
- . . Saturn S-1C stage
- . . Saturn S-2 stage
- . . Saturn S-4 stage
- . . Saturn S-4B stage
- . single stage rocket vehicles
- . . Agena rocket vehicles
- . . . Agena A rocket vehicle
- . . . Agena B rocket vehicle
- . . . Agena C rocket vehicle
- . . . Agena D rocket vehicle
- . . Arcas rocket vehicles
- . . Black Brant sounding rockets
- . . . Black Brant 1 sounding rocket
- . . . Black Brant 2 sounding rocket
- . . . Black Brant 3 sounding rocket
- . . . Black Brant 4 sounding rocket
- . . . Black Brant 5 sounding rocket
- . . Black Knight rocket vehicle
- . . Domier paraglider rocket vehicle
- . . Genie rocket vehicle
- . . Honest John rocket vehicle
- . . Hyla-Star rocket vehicle
- . . Little John rocket vehicle
- . . Loki rocket vehicle
- . . Nomad launch vehicle
- . . Veronique rocket vehicles
- . . Viking rocket vehicle
- . . Zuni rocket vehicle
- . sounding rockets
- . . Aerobee rocket vehicle
- . . Antares rocket vehicle
- . . Apache rocket vehicle
- . . Arcas rocket vehicles
- . . Aries sounding rocket
- . . Astrobee rocket vehicles
- . . . Astrobee 1500 rocket vehicle
- . . Black Brant sounding rockets
- . . . Black Brant 1 sounding rocket
- . . . Black Brant 2 sounding rocket
- . . . Black Brant 3 sounding rocket
- . . . Black Brant 4 sounding rocket
- . . . Black Brant 5 sounding rocket
- . . Cajun rocket vehicle
- . . Domier paraglider rocket vehicle
- . . EXOS sounding rocket
- . . Jaguar rocket vehicle
- . . Judi-Dart rocket
- . . Kappa rocket vehicles
- . . . Kappa 8 rocket vehicle
- . . . Kappa 9 rocket vehicle
- . . Lambda rocket vehicles
- . . Loki rocket vehicle
- . . Petrel sounding rocket
- . . Phoenix sounding rocket
- . . Skua rocket vehicles
- . . Skylark rocket vehicle
- . . Venus fly trap rocket vehicle
- . . Veronique rocket vehicles
- . . Vertikal rockets
- . . WASP sounding rocket
- . Standard Launch Vehicles
- . . Atlas SLV-3 launch vehicle
- . Standard Launch Vehicle 5
- . surface to surface rockets
- . . Honest John rocket vehicle
- . . Little John rocket vehicle
- . Thorad launch vehicles
- . . Thor Able rocket vehicle
- . . Thor Agena launch vehicle
- . . Thor Delta launch vehicle
- . . Titan Centaur launch vehicle

RT

acoustic sounding

## rocket-based combined-cycle engines

- ∞ ballistic vehicles
- ∞ flight vehicles
  - HEUS rocket engines
  - launch vehicles
  - missile configurations
  - multiengine vehicles
- ∞ rockets
  - Space Processing Applications
    - Rocket
  - stage separation
  - test vehicles
    - Trailblazer 1 reentry vehicle
    - Trailblazer 2 reentry vehicle
- ∞ vehicles
- ∞ winged vehicles
  - X-17 reentry vehicle

### rocket-based combined-cycle engines

(added August 1999)

DEF Launch vehicle engines that integrate a high specific impulse, low thrust-to-weight, airbreathing engine with a low-impulse, high thrust-to-weight rocket. The engines are often defined by four modes of operation in a single-stage-to-orbit configuration. In the first mode, the engine functions as a rocket-driven ejector. When the rocket engine is switched off, subsonic combustion (mode 2) is present in the ramjet mode. As the vehicle continues to accelerate, supersonic combustion (mode 3) occurs in the ramjet mode. Finally, as the edge of the atmosphere is approached and the engine inlet is closed off, the rocket is reignited and the final ascent to orbit is undertaken in an all-rocket mode (mode 4).

UF *RBCC engines*

GS engines

. rocket engines

. . **rocket-based combined-cycle engines**

RT air breathing boosters  
 air breathing engines  
 hybrid propulsion  
 integral rocket ramjets  
 ramjet engines  
 single stage to orbit vehicles  
 spacecraft propulsion  
 supersonic combustion ramjet engines

### rocket-borne instruments

RT controllers  
 flight test instruments

∞ instruments

measuring instruments  
 meteorological instruments  
 position indicators

### rocket-borne photography

GS imagery

. photography

. . **rocket-borne photography**

RT aerial photography  
 astronomical photography  
 black and white photography  
 photomapping  
 satellite-borne photography  
 spaceborne photography

## ∞ rockets

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT air slew missiles  
 ammunition  
 escape rockets  
 heavy lift launch vehicles  
 incendiary ammunition  
 launch vehicles  
 missiles  
 nuclear ramjet engines  
 nuclear rocket engines  
 nuclear weapons  
 Patriot missile  
 Petrel sounding rocket  
 pyrotechnics  
 reentry  
 reentry vehicles  
 rocket catapults  
 rocket engines

rocket launchers  
 rocket vehicles  
 rockoons  
 space flight  
 surface to air missiles  
 surface to surface missiles  
 surface to surface rockets  
 torpedoes  
 warheads  
 weapon systems  
 weapons delivery

### rockoons

DEF High altitude sounding systems that consist of small solid propellant research rockets carried aloft by large plastic balloons.

RT high altitude balloons  
 meteorological balloons  
 ROBIN balloons  
 rocket launchers  
 ∞ rockets  
 skyhook balloons

### rocks

DEF Naturally formed aggregates of mineral matter occurring in large masses or fragments. Used for stones (rocks).

UF *stones (rocks)*

GS **rocks**

. andesite  
 . ataxite  
 . bedrock  
 . . Baltic Shield (Europe)  
 . . batholiths  
 . breccia  
 . gneiss  
 . igneous rocks  
 . . anorthosite  
 . . basalt  
 . . diorite  
 . . dunite  
 . . eclogite  
 . . felsite  
 . . gabbro  
 . . granite  
 . . obsidian  
 . . . moldavite  
 . . peridotite  
 . . pumice  
 . . rhyolite  
 . . syenite  
 . . trachyte  
 . lunar rocks  
 . . krep  
 . metamorphic rocks  
 . . quartzite  
 . regolith  
 . schist  
 . sedimentary rocks  
 . . carbonaceous rocks  
 . . . coal  
 . . . . anthracite  
 . . . . lignite  
 . . . . solvent refined coal  
 . . limestone  
 . . sandstones  
 . . shales  
 . shatter cones

RT aggregates

bauxite  
 boreholes  
 clays  
 contacts (geology)  
 crossbedding (geology)  
 dirt  
 dolomite (mineral)  
 Earth resources  
 effusives  
 enstatite  
 folds (geology)  
 formations  
 geology  
 gypsum  
 inliers (landforms)  
 karst  
 landslides  
 laterites  
 lava  
 ledges

lithology  
 magma  
 metamorphism (geology)  
 minerals  
 nunataks  
 olivine  
 outliers (landforms)  
 paleomagnetism  
 petrography  
 petrology  
 pyroxenes  
 quartz  
 reefs  
 rock intrusions  
 rock mechanics  
 serpentine  
 soils  
 stratigraphy  
 tunneling (excavation)  
 veins (petrology)

### Rockwell hardness

GS mechanical properties  
 . hardness

. . **Rockwell hardness**

RT microhardness

### Rocky Mountains (North America)

GS landforms

. mountains

. . **Rocky Mountains (North America)**

RT Canada  
 United States

### rodents

GS animals

. vertebrates

. . mammals

. . . **rodents**

. . . . guinea pigs

. . . . hamsters

. . . . mice

. . . . . jerboas

. . . . . knockout mice

. . . . . pocket mice

. . . . rabbits

. . . . rats

. . . . squirrels

. . . . . ground squirrels

### rods

GS **rods**

. control rods

RT bars

billets

directors (antenna elements)

structural members

wire

*Roe flux difference splitting scheme*

USE **flux difference splitting**

*Roentgen satellite*

USE **ROSAT mission**

*Rogallo wings*

USE **flexible wings  
 folding structures**

*rogue planets*

(added April 2001)

USE **hypothetical planets**

### roll

DEF The act of rolling; rotational or oscillatory movement of an aircraft or similar body about a longitudinal axis through the body -- called roll for any degree of such rotation. The amount of this movement, i.e., the angle of roll.

GS attitude (inclination)

. **roll**

RT damping

lateral control

lateral oscillation

lateral stability

pitch (inclination)

rollers

∞ rolling

rolling moments

rotation  
sideslip  
turning flight  
wing rock  
yaw

*roll control*

USE **lateral control**

**roll forming**

GS forming techniques  
. **roll forming**  
RT cold working  
metal working

**roller bearings**

GS bearings  
. antifriction bearings  
. . **roller bearings**  
. . . needle bearings  
RT ball bearings  
thrust bearings

**rollers**

RT conveyors  
cylindrical bodies  
dispensers  
distributors  
idlers  
platens  
pulleys  
roll  
tires  
vehicle wheels  
wheels

∞ **rolling**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ausforming  
flattening  
forging  
leveling  
metal working  
roll

**rolling contact loads**

GS loads (forces)  
. contact loads  
. . **rolling contact loads**  
. dynamic loads  
. . **rolling contact loads**  
RT antifriction bearings  
stresses  
structural design criteria

**rolling moments**

DEF Moments that tend to rotate an aircraft, rocket or spacecraft about a longitudinal axis. These moments are considered positive when they tend to depress the starboard side of the body.

GS moments  
. stability derivatives  
. . **rolling moments**  
RT aerodynamic coefficients  
lateral stability  
moments of inertia  
pitching moments  
roll  
torque  
yawing moments

*rollup solar arrays*

USE **solar arrays**

*ROM devices*

USE **read-only memory devices**

**Romania**

UF *Rumania*  
GS nations  
. **Romania**  
RT Black Sea  
Central Europe  
Europe

**Ronchi test**

DEF An improvement on the Foucault knife-edge test for curved mirrors, in which the knife

edge is replaced with a transmission grating with 15 to 80 lines per centimeter, and the pinhole source is replaced with a slit or a section of the same grating.

GS interferometry  
. **Ronchi test**  
RT electromagnetic radiation  
etalons  
gratings (spectra)  
interferometers  
measuring instruments  
optical measurement

**roofs**

RT buildings  
sheaths

**room temperature**

DEF A temperature in the range of 20 to 30 C (68 to 85 F).  
GS temperature  
. **room temperature**  
RT ambient temperature  
operating temperature

**rooms**

GS **rooms**  
. clean rooms  
. darkrooms  
RT compartments  
enclosures  
∞ lounges

**root-mean-square errors**

DEF In statistics, the square root of the arithmetic mean of the squares of the deviations of the various items from the arithmetic mean of the whole.

GS errors  
. **root-mean-square errors**  
RT error analysis  
statistical analysis

∞ **roots**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT plant roots  
radicals  
roots of equations  
wing roots

**roots of equations**

UF *zero crossings*  
RT eigenvalues  
∞ equations  
existence theorems  
matrices (mathematics)  
Newton methods  
nonlinear equations  
polynomials  
∞ roots

**Rorschach tests**

GS psychological tests  
. **Rorschach tests**  
RT mental health  
psychology  
∞ tests

**ROSAT mission**

UF *Roentgen satellite*  
GS artificial satellites  
. **ROSAT mission**  
observatories  
. astronomical observatories  
. . **ROSAT mission**  
RT astronomical satellites  
international cooperation  
spaceborne astronomy  
spaceborne telescopes  
x ray astronomy  
x ray sources  
x ray telescopes

**Rosetta mission**

(added October 1995)  
UF *CNSR*  
GS space missions  
. asteroid missions  
. . **Rosetta mission**

RT comet nuclei  
Comet Rendezvous Asteroid Flyby Mission  
∞ missions  
Near Earth Asteroid Rendezvous Mission  
rendezvous trajectories  
sampling

**rosette shapes**

GS shapes  
. **rosette shapes**  
RT antenna radiation patterns  
crystallites  
spherulites  
strain gages

**Roshko prediction**

GS predictions  
. **Roshko prediction**  
RT bluff bodies  
laminar flow  
Oseen approximation  
three dimensional flow

**rosin**

GS gums (substances)  
. **rosin**  
RT organic materials

**Ross ice shelf**

GS regions  
. polar regions  
. . Antarctic regions  
. . . **Ross ice shelf**  
. remote regions  
. . Antarctic regions  
. . . **Ross ice shelf**  
Southern Hemisphere  
. Antarctic regions  
. . **Ross ice shelf**  
RT McMurdo sound

**Rossby regimes**

RT barotropic flow  
planetary waves

*Rossby waves*

USE **planetary waves**

*Rossi X Ray Timing Explorer*

(added March 1999)  
USE **X Ray Timing Explorer**

*rotary drives*

USE **mechanical drives**

**rotary engines**

DEF A positive displacement engine consisting of a rotor and stator. The control volume which encloses the working fluid during the thermodynamic cycle moves in a generally circular motion rather than a linear motion as in a piston engine.

GS engines  
. internal combustion engines  
. . **rotary engines**  
. . . Wankel engines  
RT aircraft engines  
automobile engines  
piston engines

**rotary gyroscopes**

GS gyroscopes  
. **rotary gyroscopes**  
. . fluid rotor gyroscopes  
RT gyroscope fluids  
gyroscopic stability  
rotating bodies

**rotary stability**

UF *whirl instability*  
GS dynamic characteristics  
. dynamic stability  
. . motion stability  
. . . **rotary stability**  
. . . . gyroscopic stability  
stability  
. dynamic stability  
. . motion stability  
. . . **rotary stability**

## rotary wing aircraft

RT . . . . gyroscopic stability  
airfoil oscillations  
directional stability  
flow stability  
lateral stability  
longitudinal stability  
rotating bodies  
rotation  
rotor dynamics

### rotary wing aircraft

DEF A heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors.

UF *rotorcraft*

GS V/STOL aircraft

#### . rotary wing aircraft

. . . autogyros  
. . . Avian 2/180 autogyro  
. . . helicopters  
. . . Alouette helicopters  
. . . . SA-330 helicopter  
. . . . SE-3160 helicopter  
. . . Bell 214A helicopter  
. . . compound helicopters  
. . . . S-67 helicopter  
. . . H-17 helicopter  
. . . heavy lift helicopters  
. . . . CH-62 helicopter  
. . . light helicopters  
. . . . OH-4 helicopter  
. . . . OH-5 helicopter  
. . . . OH-6 helicopter  
. . . . OH-58 helicopter  
. . . military helicopters  
. . . . AH-1G helicopter  
. . . . AH-1S helicopter  
. . . . AH-1W helicopter  
. . . . AH-63 helicopter  
. . . . AH-64 helicopter  
. . . . BO-105 helicopter  
. . . . CH-3 helicopter  
. . . . CH-21 helicopter  
. . . . CH-34 helicopter  
. . . . CH-46 helicopter  
. . . . CH-47 helicopter  
. . . . CH-54 helicopter  
. . . . CH-62 helicopter  
. . . . H-19 helicopter  
. . . . H-43 helicopter  
. . . . H-53 helicopter  
. . . . H-54 helicopter  
. . . . H-56 helicopter  
. . . . H-60 Helicopter  
. . . . HC-3 helicopter  
. . . . HH-43 helicopter  
. . . . HH-65 helicopter  
. . . . OH-4 helicopter  
. . . . OH-5 helicopter  
. . . . OH-6 helicopter  
. . . . OH-13 helicopter  
. . . . OH-23 helicopter  
. . . . OH-58 helicopter  
. . . . P-531 helicopter  
. . . . QH-50 helicopter  
. . . . S-67 helicopter  
. . . . SA-321 helicopter  
. . . . SA-330 helicopter  
. . . . SH-3 helicopter  
. . . . SH-4 helicopter  
. . . . Sikorsky Whirlwind helicopter  
. . . . UH-1 helicopter  
. . . . UH-2 helicopter  
. . . . UH-34 helicopter  
. . . . UH-60A helicopter  
. . . . UH-61A helicopter  
. . . . Westland Whirlwind helicopter  
. . . . XV-9A aircraft  
. . . rigid rotor helicopters  
. . . . CH-3 helicopter  
. . . . F-28 helicopter  
. . . . XH-51 helicopter  
. . . S-58 helicopter  
. . . S-61 helicopter  
. . . tandem rotor helicopters  
. . . . CH-46 helicopter  
. . . . CH-47 helicopter  
. . . . H-25 helicopter  
. . . EH-101 helicopter

. . . TH-55 helicopter  
. . . rotor systems research aircraft  
. . . tilt rotor aircraft  
. . . V-22 aircraft  
. . . XV-15 aircraft  
RT ∞ aircraft  
autorotation  
commercial aircraft  
lifting rotors  
∞ military aircraft  
passenger aircraft  
rotor stator interactions  
short takeoff aircraft  
∞ subsonic aircraft  
transport aircraft  
vertical takeoff aircraft  
Weser aircraft  
Westland aircraft

### rotary wings

UF *helicopter rotors*

*hinged rotor blades*

GS airfoils

. wings

#### . . rotary wings

. . . circulation control rotors

. . . lifting rotors

. . . bearingless rotors

. . . rigid rotors

. . . tilting rotors

. . . tip driven rotors

. . . x wing rotors

rotating bodies

. rotors

#### . . rotary wings

. . . circulation control rotors

. . . lifting rotors

. . . bearingless rotors

. . . rigid rotors

. . . tilting rotors

. . . tip driven rotors

. . . x wing rotors

RT blade tips

∞ blades

blade-vortex interaction

convertible fan-shaft engines

fan blades

flapping hinges

folding structures

ground resonance

harmonic control

helicopter propeller drive

helicopter tail rotors

lift fans

propeller blades

∞ rotor blades

rotor dynamics

tail rotors

Tilt Rotor Research Aircraft Program

V-22 aircraft

whirl towers

*rotating*

USE **rotation**

### rotating bodies

UF *rotating vehicles*

*solid rotation*

GS **rotating bodies**

. lunar rotation

. rotating cylinders

. rotating disks

. rotating spheres

. rotors

. . compressor rotors

. . flywheels

. . impellers

. . pump impellers

. . rotary wings

. . . circulation control rotors

. . . lifting rotors

. . . bearingless rotors

. . . rigid rotors

. . . tilting rotors

. . . tip driven rotors

. . . x wing rotors

. . . tail rotors

. . . helicopter tail rotors

. . . tip vanes

. . turbine wheels

. . wave rotors  
RT axes of rotation  
∞ bodies  
planetary rotation  
Roche limit  
rotary gyroscopes  
rotary stability  
rotation  
spinning unguided rocket trajectory

### rotating cylinders

GS rotating bodies  
. **rotating cylinders**  
symmetrical bodies  
. bodies of revolution  
. . cylindrical bodies  
. . . **rotating cylinders**  
RT Couette flow  
∞ cylinders  
cylindrical shells  
elastohydrodynamics  
Magnus effect  
shafts (machine elements)  
viscometers  
viscometry

### rotating disks

GS disks (shapes)  
. **rotating disks**  
rotating bodies  
. **rotating disks**  
RT accretion disks  
counter rotation  
Karman-Bodewadt flow  
mistuning (turbomachinery)

### ∞ rotating electrical machines

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT armatures  
commutators  
electric hybrid vehicles  
electric motors  
induction motors  
∞ machinery  
rotating generators  
rotors  
servomotors  
stators

### rotating environments

GS environments  
. **rotating environments**  
RT artificial gravity  
Barany chair  
clinorotation  
clinostats  
Coriolis effect  
high gravity environments  
Langley complex coordinator  
spacecraft environments  
tumbling motion

### rotating fluids

GS matter (physics)  
. rotating matter  
. . **rotating fluids**  
. . . rotating liquids  
. . . rotating plasmas  
RT counter rotation  
∞ fluids  
Goertler instability  
Karman-Bodewadt flow  
liquid sloshing  
planetary waves  
superrotation  
Taylor instability  
trapped vortices  
turbulent flow  
vortex sheets  
vortices  
wing tip vortices

### rotating generators

UF *dynamos*  
GS electric generators  
. **rotating generators**  
. . amplidyne  
. . dynamometers  
. . homopolar generators

- . . turbogenerators
  - . . . ASTEC solar turboelectric generator
  - RT AC generators
  - commutators
  - DC generators
  - electrostatic generators
  - ∞ generators
  - ∞ rotating electrical machines
  - turbines
  - turbomachinery
- rotating liquids**
- UF *liquid rotation*
  - GS liquids
  - . **rotating liquids**
  - matter (physics)
  - . rotating matter
  - . . rotating fluids
  - . . . **rotating liquids**
  - RT Goertler instability
  - planetary waves
  - rotation
  - trapped vortices
  - vortices
- rotating matter**
- GS matter (physics)
  - . **rotating matter**
  - . . rotating fluids
  - . . . rotating liquids
  - . . . rotating plasmas
  - RT degenerate matter
  - rotation
  - spin dynamics
- rotating mirrors**
- GS mirrors
  - . **rotating mirrors**
  - RT framing cameras
  - high speed cameras
- rotating plasmas**
- GS matter (physics)
  - . rotating matter
  - . . rotating fluids
  - . . . **rotating plasmas**
  - particles
  - . charged particles
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **rotating plasmas**
  - . corpuscular radiation
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . **rotating plasmas**
  - RT drift rate
  - nonequilibrium plasmas
  - plasma flux measurement
  - theta pinch
  - toroidal plasmas
  - two fluid models
  - zeta pinch
- rotating shafts**
- GS shafts (machine elements)
  - . **rotating shafts**
  - . . turboshafts
- rotating spheres**
- GS rotating bodies
  - . **rotating spheres**
  - symmetrical bodies
  - . bodies of revolution
  - . . spheres
  - . . . **rotating spheres**
  - RT equators
  - spherical shells
- rotating stalls**
- RT aerodynamic stalling
  - boundary layer separation
  - compressor blades
  - ∞ rotor blades
  - ∞ stalling
- turbocompressors
- rotating vehicles*
- USE **rotating bodies vehicles**
- rotation**
- DEF The motion of a body about some straight line wherein the particles of the body along the line or its extensions have a zero velocity relative to some reference. The line of stationary particles is called the axis of rotation. Used for rotating, whirl, and whirling.
- UF *rotating whirl whirling*
  - GS gyration
  - . **rotation**
  - . . autorotation
  - . . corotation
  - . . counter rotation
  - . . Earth rotation
  - . . galactic rotation
  - . . image rotation
  - . . lunar rotation
  - . . molecular rotation
  - . . muon spin rotation
  - . . planetary rotation
  - . . satellite rotation
  - . . stellar rotation
  - . . . solar rotation
  - . . clinorotation
  - . . superrotation
  - RT angular acceleration
  - angular velocity
  - axes of rotation
  - circulation
  - coning motion
  - Coriolis effect
  - cross polarization
  - Faraday effect
  - libration
  - ∞ motion
  - nutaton
  - pitch (inclination)
  - polarization (spin alignment)
  - polarization (waves)
  - precession
  - revolving
  - roll
  - rotary stability
  - rotating bodies
  - rotating liquids
  - rotating matter
  - rotors
  - torque
  - vortex avoidance
  - vortices
  - yaw
- rotational flow*
- USE **fluid flow vortices**
- rotational spectra**
- (added July 1989)
- GS molecular properties
  - . molecular spectra
  - . . **rotational spectra**
  - spectra
  - . molecular spectra
  - . . **rotational spectra**
  - RT absorption spectra
  - line spectra
  - molecular excitation
  - molecular rotation
  - molecular spectroscopy
  - rotational states
  - vibrational spectra
- rotational states**
- (added December 1993)
- SN (LIMITED TO MOLECULAR ENERGY LEVELS - EXCLUDES ROTATIONAL DYNAMICS OF VEHICLES OR OTHER BODIES)
  - GS level (quantity)
  - . energy levels
  - . . molecular energy levels
  - . . . **rotational states**
  - molecular properties
- . molecular energy levels
  - . . **rotational states**
  - molecular excitation
  - rotational spectra
- Rotifera**
- DEF A phylum of multicellular animals in the subkingdom Eumatazoa.
- GS animals
  - . invertebrates
  - . . **Rotifera**
  - microorganisms
  - . **Rotifera**
  - RT worms
- rotochutes**
- GS parachutes
  - . **rotochutes**
  - RT autorotation
- rotons**
- GS mechanics (physics)
  - . fluid mechanics
  - . . fluid dynamics
  - . . . **rotons**
  - RT activation energy
  - excitation
  - photons
  - rotation
- rotor aerodynamics**
- GS mechanics (physics)
  - . fluid mechanics
  - . . fluid dynamics
  - . . . gas dynamics
  - . . . . aerodynamics
  - . . . . . **rotor aerodynamics**
  - RT Ffowkes Williams-Hawkings equation
  - flapping
  - flapping hinges
  - ground resonance
  - rotor body interactions
  - rotor dynamics
  - rotor stator interactions
  - rotors
  - whirl towers
- ∞ **rotor blades**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT helicopter tail rotors
  - mistuning (turbomachinery)
  - rotary wings
  - rotating stalls
  - rotor blades (turbomachinery)
  - tail rotors
  - x wing rotors
- rotor blades (turbomachinery)**
- UF *impeller blades*
  - GS turbomachine blades
  - . **rotor blades (turbomachinery)**
  - RT airfoils
  - blade tips
  - ∞ blades
  - compressor blades
  - compressor rotors
  - impellers
  - mistuning (turbomachinery)
  - ∞ rotor blades
  - rotor stator interactions
  - rotors
  - stator blades
  - turbine blades
- rotor body interactions**
- DEF Aerodynamic interactions between a helicopter rotor and a body.
- RT aerodynamic characteristics
  - aerodynamic configurations
  - helicopter design
  - rotor aerodynamics
  - rotor stator interactions
- rotor disks*
- USE **turbine wheels**
- rotor dynamics**
- (added July 1989)
- UF *rotordynamics*



## rotor lift

RT dynamic characteristics  
dynamic response  
dynamic stability  
∞ dynamics  
rotary stability  
rotary wings  
rotor aerodynamics  
rotors  
structural vibration  
turbomachinery

### rotor hubs

USE **hubs**  
**rotors**

## rotor lift

GS aerodynamic characteristics  
. lift  
. . . **rotor lift**  
aerodynamic forces  
. lift  
. . . **rotor lift**  
dynamic characteristics  
. lift  
. . . **rotor lift**  
RT distribution (property)

## rotor speed

GS rates (per time)  
. **rotor speed**  
velocity  
. **rotor speed**  
RT angular velocity  
high speed  
labyrinth seals  
tip speed

## rotor stator interactions

(added June 1995)

DEF Aerodynamic interaction between a rotor and a stator.

RT aerodynamic interference  
interactional aerodynamics  
rotary wing aircraft  
rotor aerodynamics  
rotor blades (turbomachinery)  
rotor body interactions  
stator blades  
structural stability  
supersonic turbines  
surface noise interactions  
tilt rotor aircraft  
turbine blades

## rotor systems research aircraft

GS research vehicles  
. research aircraft  
. . . **rotor systems research aircraft**  
V/STOL aircraft  
. rotary wing aircraft  
. . . **rotor systems research aircraft**  
RT ∞ aircraft  
aircraft design  
helicopters  
NASA programs  
∞ systems

### rotorcraft

USE **rotary wing aircraft**

### rotordynamics

USE **rotor dynamics**

## rotors

UF *rotor hubs*  
GS rotating bodies  
. **rotors**  
. . . compressor rotors  
. . . flywheels  
. . . impellers  
. . . pump impellers  
. . . rotary wings  
. . . circulation control rotors  
. . . lifting rotors  
. . . . bearingless rotors  
. . . . rigid rotors  
. . . . tilting rotors  
. . . . tip driven rotors  
. . . . x wing rotors  
. . . tail rotors

. . . helicopter tail rotors  
. . . tip vanes  
. . . turbine wheels  
. . . wave rotors

## RT

airfoils  
armatures  
centrifugal compressors  
heavy lift airships  
mistuning (turbomachinery)  
∞ rotating electrical machines  
rotor aerodynamics  
rotor blades (turbomachinery)  
rotor dynamics  
stators  
turbines  
turbocompressors  
turbomachine blades  
turboshafts  
wheels  
wings

## roughness

GS **roughness**  
. sea roughness  
. surface roughness  
RT coarseness  
contours  
flatness  
mechanical properties  
motion stability  
profilometers  
smoothing  
surface properties

## round trip trajectories

GS trajectories  
. **round trip trajectories**  
. . . circumlunar trajectories  
RT Earth-Moon trajectories  
interorbital trajectories  
interplanetary flight  
interplanetary trajectories  
moon-Earth trajectories  
orbital mechanics  
spacecraft trajectories  
swingby technique

## Rouse belts

RT ∞ belts  
cones (volcanoes)  
earthquakes  
geological faults  
Mars volcanoes  
seismology  
tremors  
volcanoes  
volcanology

## routes

RT air traffic control  
flight plans  
∞ paths  
site selection  
transportation

## ∞ routines

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT computer programs  
computer systems programs  
data conversion routines  
disk operating system (DOS)  
input/output routines  
merging routines  
operating systems (computers)  
user manuals (computer programs)

## Rover project

GS programs  
. NASA programs  
. . . NASA space programs  
. . . . **Rover project**  
. . . projects  
. . . . **Rover project**  
. . . space programs  
. . . . NASA space programs  
. . . . . **Rover project**  
RT KIWI reactors  
nuclear engine for rocket vehicles  
nuclear propulsion

nuclear reactors  
RIFT (reactor in flight test)  
rocket engine design  
spacecraft propulsion

## roving vehicles

UF *extraterrestrial roving vehicles*  
GS surface vehicles  
. **roving vehicles**  
. . . lunar roving vehicles  
. . . Lunokhod lunar roving vehicles  
. . . manned lunar surface vehicles  
. . . Mars roving vehicles  
. . . Marsokhod Mars roving vehicles  
RT Mars sample return missions  
planetary landing  
planetary surfaces  
research vehicles  
toroidal wheels  
unmanned ground vehicles  
∞ vehicles

## ∞ roving

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT composite materials  
webs (sheets)  
yarns

## Rowland circles

RT gratings (spectra)  
optical filters

## RP-1 rocket propellants

GS propellants  
. rocket propellants  
. . . liquid rocket propellants  
. . . . **RP-1 rocket propellants**  
RT JP-4 jet fuel  
kerosene

### RPV

USE **remotely piloted vehicles**

### RS codes

USE **Reed-Solomon codes**

### RTM (composite materials)

USE **resin transfer molding**

## RTV-40 rubber (trademark)

GS elastomers  
. rubber  
. . . synthetic rubbers  
. . . . silicone rubber  
. . . . . **RTV-40 rubber (trademark)**  
. . . . vulcanized elastomers  
. . . . . **RTV-40 rubber (trademark)**

## RTV-60 rubber (trademark)

GS elastomers  
. rubber  
. . . synthetic rubbers  
. . . . silicone rubber  
. . . . . **RTV-60 rubber (trademark)**  
. . . . vulcanized elastomers  
. . . . . **RTV-60 rubber (trademark)**

### Ruanda-Urundi

USE **Burundi**  
**Rwanda**

## rubber

DEF A material that is capable of recovering from large deformations quickly and forcibly, and can be, or already is modified to a state in which it is essentially insoluble (but can swell) in boiling solvent such as benzene, methyl ethyl ketone, and ethanol-toluene azeotrope.

GS elastomers  
. **rubber**  
. . . synthetic rubbers  
. . . . Adiprene (trademark)  
. . . . Buna (trademark)  
. . . . silicone rubber  
. . . . . RTV-40 rubber (trademark)  
. . . . . RTV-60 rubber (trademark)  
. . . . Viton rubber (trademark)  
. . . . vulcanized elastomers  
. . . . . RTV-40 rubber (trademark)

- . . . . RTV-60 rubber (trademark)
- . . . . chloroprene resins
- RT guayule
- gums (substances)
- latex
- organic materials
- polyisoprenes
- rubber coatings**
- GS coatings
- . **rubber coatings**
- RT paints
- protective coatings
- rubidium**
- GS chemical elements
- . alkali metals
- . . **rubidium**
- . . . rubidium isotopes
- . . . . rubidium 86
- metals
- . alkali metals
- . . **rubidium**
- . . . rubidium isotopes
- . . . . rubidium 86
- rubidium 86**
- GS chemical elements
- . alkali metals
- . . rubidium
- . . . rubidium isotopes
- . . . . **rubidium 86**
- . nuclides
- . . isotopes
- . . . radioactive isotopes
- . . . . **rubidium 86**
- . . . . rubidium isotopes
- . . . . **rubidium 86**
- metals
- . alkali metals
- . . rubidium
- . . . rubidium isotopes
- . . . . **rubidium 86**
- rubidium compounds**
- RT  $\infty$  alkali metal compounds
- $\infty$  chemical compounds
- $\infty$  metal compounds
- rubidium isotopes**
- GS chemical elements
- . alkali metals
- . . rubidium
- . . . **rubidium isotopes**
- . . . . rubidium 86
- . nuclides
- . . isotopes
- . . . **rubidium isotopes**
- . . . . rubidium 86
- metals
- . alkali metals
- . . rubidium
- . . . **rubidium isotopes**
- . . . . rubidium 86
- Rubis rocket vehicle**
- GS rocket vehicles
- . multistage rocket vehicles
- . . **Rubis rocket vehicle**
- RT solid propellant rocket engines
- ruby**
- RT aluminum oxides
- crystals
- ruby lasers**
- GS electronic equipment
- . solid state devices
- . . solid state lasers
- . . . **ruby lasers**
- stimulated emission devices
- . lasers
- . . solid state lasers
- . . . **ruby lasers**
- RT pulsed lasers
- Q switched lasers
- Verneuil process
- rudders**
- GS control surfaces
- . **rudders**
- . . aerial rudders
- . . . marine rudders
- RT airfoils
- fins
- pintles
- stabilizers (fluid dynamics)
- sweptback tail surfaces
- tabs (control surfaces)
- tail assemblies
- tail surfaces
- trapezoidal tail surfaces
- ruggedness**
- RT durability
- $\infty$  high resistance
- mechanical properties
- $\infty$  rigidity
- ruler method**
- RT  $\infty$  methodology
- rules**
- GS **rules**
- . flight rules
- . . instrument flight rules
- . . visual flight rules
- . Palmgren-Miner rule
- . phase rule
- . selection rules (nuclear physics)
- . sum rules
- . Whitham rule
- RT laws
- patent policy
- policies
- procurement policy
- regulations
- sea law
- Rumania*
- USE **Romania**
- run time (computers)**
- RT computer programming
- computers
- time sharing
- Runge-Kutta method**
- DEF A method for the numerical solution of an ordinary differential equation.
- GS analysis (mathematics)
- . numerical analysis
- . . numerical integration
- . . . **Runge-Kutta method**
- . real variables
- . . measure and integration
- . . . numerical integration
- . . . . **Runge-Kutta method**
- RT  $\infty$  methodology
- running**
- GS locomotion
- . **running**
- RT gait
- physical exercise
- walking
- runoffs*
- USE **drainage**
- runway alignment**
- SN (ALIGNMENT WITH RUNWAYS--NOT ALIGNMENT OF RUNWAYS)
- RT aircraft landing
- takeoff runs
- runway conditions**
- GS conditions
- . **runway conditions**
- RT aviation meteorology
- ice
- runway incursions
- runways
- slush
- surface roughness
- water
- weather
- runway incursions**
- (added May 2006)
- DEF Any occurrence at an airport involving an aircraft, vehicle, person or object on the ground, that creates a collision hazard or results in the loss of separation with an aircraft taking off, intending to take off or intending to land.
- GS hazards
- . aircraft hazards
- . . **runway incursions**
- RT aerospace safety
- aircraft accidents
- aircraft safety
- airfield surface movements
- airport surface detection equipment
- collision avoidance
- collisions
- crashes
- flight safety
- runway conditions
- runways
- situational awareness
- runway lights**
- GS landing aids
- . airport lights
- . . **runway lights**
- lighting equipment
- . luminaires
- . . airport lights
- . . . **runway lights**
- RT approach control
- $\infty$  flares
- $\infty$  markers
- runways
- searchlights
- visual control
- runways**
- DEF A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length.
- RT airfield surface movements
- airports
- landing
- landing aids
- landing mats
- landing sites
- pavements
- runway conditions
- runway incursions
- runway lights
- $\infty$  strip
- takeoff
- taxiing
- rupturing**
- RT  $\infty$  blisters
- bursts
- cracking (fracturing)
- disrupting
- failure
- fracture mechanics
- metal fatigue
- self sealing
- structural strain
- tearing
- rural areas**
- RT agriculture
- farmlands
- grasslands
- land
- megalopolises
- rangelands
- regional planning
- residential areas
- suburban areas
- wilderness
- rural land use**
- GS land use
- . **rural land use**
- RT agriculture
- conservation
- $\infty$  development
- Earth resources
- farmlands
- grasslands
- grazing
- Great Plains Corridor (North America)
- land
- land management

## Russian Federation

orchards  
rangelands  
regional planning  
sites

Russia

USE **Russian Federation**

### Russian Federation

(added August 1993)

UF *Russia*

GS nations

. **Russian Federation**

RT Asia

Automatic Universal Orbiting Stations

Europe

Moscow

Russian Space Program

### Russian Space Program

(added September 1994)

GS programs

. space programs

. . **Russian Space Program**

RT Commonwealth of Independent States

cosmonauts

Energiya launch vehicle

GLONASS

Granat satellite

international cooperation

Kvant modules

Proton launch vehicle

Russian Federation

Soviet satellites

Soviet spacecraft

U.S.S.R. space program

Vertikal rockets

### rust fungi

UF *rusts (botany)*

GS plants (botany)

. fungi

. . **rust fungi**

RT blight

∞ mold

parasitic diseases

plant diseases

### rusting

GS chemical reactions

. oxidation

. . **rusting**

corrosion

. **rusting**

RT atmospheric effects

chemical attack

coatings

corrosion resistance  
degradation  
desensitizing  
deterioration  
hot corrosion  
metal-water reactions  
oxidation resistance  
passivity  
scale (corrosion)  
weathering

*rusts (botany)*

USE **rust fungi**

### ruthenium

GS chemical elements

. **ruthenium**

. . ruthenium isotopes

metals

. noble metals

. . **ruthenium**

. . . ruthenium isotopes

. . transition metals

. . **ruthenium**

. . . ruthenium isotopes

*ruthenium 106*

USE **ruthenium isotopes**

### ruthenium alloys

GS alloys

. **ruthenium alloys**

### ruthenium compounds

RT ∞ chemical compounds

∞ metal compounds

transition metals

### ruthenium isotopes

UF *ruthenium 106*

GS chemical elements

. nuclides

. . isotopes

. . . **ruthenium isotopes**

. ruthenium

. . **ruthenium isotopes**

metals

. noble metals

. . ruthenium

. . . **ruthenium isotopes**

. . transition metals

. . ruthenium

. . . **ruthenium isotopes**

### rutherfordium

(added November 1994)

GS chemical elements

. **rutherfordium**

RT dubnium

∞ elements

### rutile

DEF A mineral form of titanium oxide (TiO<sub>2</sub>) (tetragonal crystallization), but usually produced chemically for use in ceramics and other products.

GS chalcogenides

. oxides

. . metal oxides

. . . titanium oxides

. . . . **rutile**

titanium compounds

. titanium oxides

. . **rutile**

RT anatase

coesite

cross relaxation

minerals

pigments

stishovite

### Rwanda

UF *Ruanda-Urundi*

GS nations

. **Rwanda**

RT Africa

Burundi

*RXTE (satellite)*

(added March 1999)

USE **X Ray Timing Explorer**

### Ryan aircraft

GS **Ryan aircraft**

. Firebee 2 target drone aircraft

. X-13 aircraft

. XC-142 aircraft

. XV-5 aircraft

. XV-8A aircraft

RT ∞ aircraft

### Rydberg series

GS spectra

. radiation spectra

. . electromagnetic spectra

. . . line spectra

. . . . **Rydberg series**

RT

absorption spectra

atomic spectra

electron transitions

emission spectra

H lines

hydrogen

# S

## S band

USE **superhigh frequencies**  
**ultrahigh frequencies**

## S curves

GS geometry  
 . curves (geometry)  
 . . **S curves**  
 . . . Gompertz curves  
 . Euclidean geometry  
 . . analytic geometry  
 . . . **S curves**  
 . . . . Gompertz curves

## S glass

GS glass  
 . E glass  
 . . **S glass**  
 RT composite materials  
 glass fiber reinforced plastics  
 glass fibers  
 silicon dioxide

## S matrix theory

UF *scattering matrix*  
 RT operators (mathematics)  
 scattering cross sections  
 ∞ theories

## S stars

GS celestial bodies  
 . stars  
 . . late stars  
 . . . cool stars  
 . . . . **S stars**  
 RT asymptotic giant branch stars  
 giant stars  
 M stars  
 Mira variables  
 red giant stars

## S waves

DEF Waves in an elastic media which cause an element of the medium to change its shape without a change in volume. Mathematically, S waves are ones whose velocity field has zero divergence. Used for secondary waves, shear disturbances, and shear waves.

UF *secondary waves*  
*shear disturbances*  
*shear waves*

GS elastic waves  
 . **S waves**  
 . . SH waves

RT crustal fractures  
 dilatational waves  
 P waves  
 polarized elastic waves  
 Rayleigh waves  
 seismic waves  
 surface waves  
 transverse waves

## S-2 aircraft

UF *US-2A aircraft*  
 GS antisubmarine warfare aircraft  
 . **S-2 aircraft**  
 monoplanes  
 . **S-2 aircraft**  
 utility aircraft  
 . **S-2 aircraft**  
 RT ∞ aircraft

## S-3 aircraft

UF *ES-3A aircraft*  
*KS-3 aircraft*  
 GS antisubmarine warfare aircraft  
 . **S-3 aircraft**  
 jet aircraft  
 . **S-3 aircraft**  
 Lockheed aircraft  
 . **S-3 aircraft**  
 monoplanes  
 . **S-3 aircraft**  
 RT ∞ aircraft

∞ military aircraft

## S-3 satellite

USE **Explorer 12 satellite**

## S-6 satellite

USE **Explorer 17 satellite**

## S-16 satellite

USE **OSO-1**

## S-17 satellite

USE **OSO-2**

## S-18 satellite

USE **OAO**

## S-27 satellite

USE **Alouette 1 satellite**

## S-49 satellite

USE **OGO-A**

## S-50 satellite

USE **OGO-C**

## S-51 satellite

USE **Ariel 1 satellite**

## S-52 satellite

USE **Ariel 2 satellite**

## S-57 satellite

USE **OSO-C**

## S-58 helicopter

UF *Sikorsky S-58 helicopter*

GS Sikorsky aircraft  
 . **S-58 helicopter**  
 transport aircraft  
 . **S-58 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . **S-58 helicopter**

RT CH-34 helicopter  
 UH-34 helicopter

## S-61 helicopter

UF *Sikorsky S-61 helicopter*

GS Sikorsky aircraft  
 . **S-61 helicopter**  
 transport aircraft  
 . **S-61 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . **S-61 helicopter**  
 RT ∞ aircraft  
 antisubmarine warfare aircraft  
 CH-3 helicopter  
 SH-3 helicopter  
 SH-4 helicopter  
 water takeoff and landing aircraft

## S-64 helicopter

USE **CH-54 helicopter**

## S-66 satellite

USE **Beacon Explorer A**

## S-67 helicopter

UF *Sikorsky S-67 helicopter*

GS Sikorsky aircraft  
 . **S-67 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . compound helicopters  
 . . . . **S-67 helicopter**  
 . . . . military helicopters  
 . . . . **S-67 helicopter**  
 RT ∞ aircraft

## S-74 satellite

USE **Explorer 18 satellite**

## SA-321 helicopter

UF *Sud Aviation SA-321 helicopter*  
 GS Sud Aviation aircraft

. **SA-321 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . military helicopters  
 . . . . **SA-321 helicopter**  
 RT ∞ aircraft

## SA-330 helicopter

UF *Sud Aviation SA-330 helicopter*

GS Sud Aviation aircraft  
 . Alouette helicopters  
 . . **SA-330 helicopter**  
 transport aircraft  
 . **SA-330 helicopter**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . Alouette helicopters  
 . . . . **SA-330 helicopter**  
 . . . . military helicopters  
 . . . . **SA-330 helicopter**

RT ∞ aircraft

## Saab 37 aircraft

GS attack aircraft  
 . fighter aircraft  
 . . **Saab 37 aircraft**  
 jet aircraft  
 . turbofan aircraft  
 . . **Saab 37 aircraft**  
 Saab aircraft  
 . **Saab 37 aircraft**  
 supersonic aircraft  
 . **Saab 37 aircraft**  
 RT ∞ aircraft  
 canard configurations  
 Harrier aircraft

## Saab 105 aircraft

GS jet aircraft  
 . turbofan aircraft  
 . . **Saab 105 aircraft**  
 light aircraft  
 . **Saab 105 aircraft**  
 monoplanes  
 . **Saab 105 aircraft**  
 Saab aircraft  
 . **Saab 105 aircraft**  
 utility aircraft  
 . **Saab 105 aircraft**  
 RT ∞ aircraft  
 passenger aircraft

## Saab aircraft

GS **Saab aircraft**  
 . Saab 37 aircraft  
 . Saab 105 aircraft  
 RT ∞ aircraft

## Sabatier reaction

GS chemical reactions  
 . **Sabatier reaction**  
 RT photographic film

## Sabot projectiles

DEF Projectiles having devices fitted around or in back of the projectiles in gun barrels or launching tubes to support or protect the projectiles or to prevent the escape of gas ahead of it. The sabot separates from the projectile after launching.

GS projectiles  
 . **Sabot projectiles**  
 RT artillery  
 fragmentation  
 gun launchers  
 guns (ordnance)

## sabotage

DEF Deliberate destructive action that may be directed against property, processes, systems, organizations, governments, or people and that is intended to prevent a process, undermine a group, or interfere with progress towards a goal.

RT accidents  
 air defense  
 damage

## Saccadic eye movements

- deactivation
  - disasters
  - hazards
  - injuries
  - prevention
  - safety
  - space law
  - terrorism
  - wreckage
- Sabre aircraft*  
USE **F-86 aircraft**
- Sabreliner aircraft*  
USE **T-39 aircraft**
- Saccadic eye movements**  
GS eye movements  
  . **Saccadic eye movements**  
RT fovea  
  ∞ motion  
  visual fields
- saccharides*  
USE **carbohydrates**
- saccharomyces**  
GS plants (botany)  
  . fungi  
  . . **saccharomyces**
- Sacramento Valley (CA)**  
GS valleys  
  . **Sacramento Valley (CA)**  
RT California  
  river basins
- saddle points**  
GS **saddle points**  
  . saddle points (game theory)  
RT curve fitting  
  game theory  
  minimax technique
- saddle points (game theory)**  
GS game theory  
  . **saddle points (game theory)**  
  saddle points  
  . **saddle points (game theory)**  
RT operations research  
  saddles  
  ∞ theories  
  zero sum games
- saddles**  
RT saddle points (game theory)
- saddles (supports)**  
GS structural members  
  . **saddles (supports)**  
  supports  
  . **saddles (supports)**
- Saenger space transportation system**  
(added September 1995)  
UF *Saenger space transportation system*  
GS transportation  
  . space transportation  
  . . space transportation system  
  . . . **Saenger space transportation system**  
RT aerospace planes  
  German space program  
  piggyback systems  
  ramjet engines  
  reusable spacecraft
- Safeguard system**  
GS weapon systems  
  . missile systems  
  . . **Safeguard system**  
RT antimissile defense  
  ballistic missiles  
  military technology  
  missile defense  
  Sentinel system  
  ∞ systems
- safety**  
GS **safety**  
  . aerospace safety
- . aircraft safety
  - . flight safety
  - . industrial safety
  - . range safety
  - . reactor safety
- RT accident prevention  
  accidents  
  air bag restraint devices  
  crashes  
  ∞ detectors  
  emergency life sustaining systems  
  energy policy  
  explosions  
  fire prevention  
  fireproofing  
  fires  
  hazards  
  prevention  
  protection  
  sabotage  
  ∞ storage  
  vortex avoidance  
  warning  
  warning systems
- safety devices**  
GS **safety devices**  
  . abort apparatus  
  . air bag restraint devices  
  . arresting gear  
  . ejection seats  
  . . flying ejection seats  
  . escape capsules  
  . escape rockets  
  . helmets  
  . seat belts  
RT accident prevention  
  accident proneness  
  accidents  
  aircraft safety  
  ambulances  
  antiskid devices  
  automobile accidents  
  ∞ barriers  
  chemical defense  
  deflectors  
  ∞ devices  
  emergency life sustaining systems  
  enclosures  
  ∞ equipment  
  fail-safe systems  
  fire prevention  
  flame deflectors  
  flight safety  
  gates (openings)  
  guards (shields)  
  harnesses  
  hazards  
  human factors engineering  
  landing aids  
  pressure suits  
  protection  
  protective clothing  
  protectors  
  radiation measuring instruments  
  radiation shielding  
  shielding  
  smoke detectors  
  space suits  
  spacecraft shielding  
  warning  
  warning systems
- safety factors**  
RT accident proneness  
  aerospace safety  
  design analysis  
  escape systems  
  hazards  
  health physics  
  reliability  
  stability
- safety management**  
GS management  
  . **safety management**  
RT accident prevention  
  aerospace safety  
  Assured Crew Return Vehicle  
  education
- fail-safe systems
  - fire prevention
  - guards (shields)
  - hazards
  - human factors engineering
  - production management
  - risk management
  - warning systems
- SAGE air defense system**  
GS air defense  
  . **SAGE air defense system**  
RT ∞ systems
- SAGE satellite**  
DEF Spacecraft for the study of stratospheric aerosols and gases. Used for Stratospheric Aerosol & Gas Experiment.  
UF *Stratospheric Aerosol & Gas Experiment*  
GS artificial satellites  
  . **SAGE satellite**  
RT aerosols  
  ozone
- Saginaw Bay (MI)**  
GS bays (topographic features)  
  . **Saginaw Bay (MI)**  
RT inlets (topography)  
  Lake Huron  
  Michigan  
  river basins
- Sagittarius constellation**  
GS constellations  
  . **Sagittarius constellation**
- Sagnac effect**  
DEF A phase shift (and consequent measurable rotation rate) caused by nonreciprocity (different optical path lengths) of two counter-propagating light waves traveling in the same coil in a fiber optic gyro or ring interferometer.  
GS phase shift  
  . **Sagnac effect**  
RT angular velocity  
  astronomical interferometry  
  etalons  
  fiber optics  
  interferometers  
  interferometry  
  laser gyroscopes  
  laser interferometry  
  light transmission  
  nonlinear optics  
  optical gyroscopes  
  optical paths  
  speckle interferometry  
  wave propagation
- Saha equations**  
RT arc heating  
  electric arcs  
  ∞ equations  
  ion density (concentration)  
  ionization potentials  
  temperature
- Sahara Desert (Africa)**  
GS land  
  . deserts  
  . . **Sahara Desert (Africa)**  
RT Africa  
  arid lands  
  barren land  
  desertification  
  dunes  
  remote regions
- SAIL project**  
UF *Shuttle Avionics Integration Laboratory*  
GS programs  
  . NASA programs  
  . . NASA space programs  
  . . . **SAIL project**  
  . projects  
  . . **SAIL project**  
  . space programs  
  . . NASA space programs

... **SAIL project**  
 RT Earth Viewing Applications Laboratory laboratories  
 space laboratories  
 space shuttles

*sailplanes*  
 USE **gliders**

**sails**  
 GS **sails**  
 . magnetic sails  
 . sailwings  
 . solar sails  
 RT fins  
 gliders  
 tail assemblies

**sailwings**  
 UF *Princeton sailwings*  
 GS folding structures  
 . **sailwings**  
 sails  
 . **sailwings**  
 RT gliders  
 hang gliders

**Saint Elmo fire**  
 GS electric current  
 . electric discharges  
 . . **Saint Elmo fire**  
 RT fires

*Saint Venant flexure problem*  
 USE **Saint Venant principle**

**Saint Venant principle**  
 UF *Saint Venant flexure problem*  
*St Venant flexure problem*  
 RT plastic deformation  
 static deformation  
 static loads  
 stress analysis  
 stress concentration  
 temperature inversions

**salicylates**  
 GS **salicylates**  
 . sodium salicylates  
 RT acetylsalicylic acid  
 drugs  
 esters

**salinity**  
 GS chemical properties  
 . **salinity**  
 RT alkalinity  
 brines  
 core sampling  
 desalinization  
 ocean currents  
 oceanographic parameters  
 sea water  
 soil sampling  
 thermohaline circulation

**saliva**  
 GS body fluids  
 . **saliva**  
 RT digestive system  
 mucus  
 salivary glands

**salivary glands**  
 UF *parotid gland*  
 GS anatomy  
 . digestive system  
 . . **salivary glands**  
 . glands (anatomy)  
 . . **salivary glands**  
 RT mouth  
 saliva

**salmonella**  
 GS microorganisms  
 . bacteria  
 . . **salmonella**

**salt baths**  
 GS baths  
 . **salt baths**

RT brines  
 heat treatment  
 molten salts

**salt beds**  
 DEF Deposits of sodium chloride and other salts resulting from the evaporation and/or precipitation of ancient oceans.

GS geology  
 . beds (geology)  
 . . **salt beds**  
 landforms  
 . beds (geology)  
 . . **salt beds**

RT brines  
 bromides  
 chlorides  
 flats (landforms)  
 sodium chlorides

*salt flats*  
 USE **flats (landforms)**

**salt spray tests**  
 GS chemical tests  
 . **salt spray tests**  
 environmental tests  
 . corrosion tests  
 . . **salt spray tests**  
 RT corrosion  
 corrosion resistance  
 spray ingestion  
 stress corrosion  
 ∞ tests

**Salton Sea (CA)**  
 GS seas  
 . **Salton Sea (CA)**  
 RT California  
 deserts

∞ **salts**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT halites  
 inorganic compounds  
 molten salts  
 organic charge transfer salts  
 organic compounds  
 sodium chlorides  
 sulfonates

**Salyut space station**  
 GS artificial satellites  
 . space stations  
 . . **Salyut space station**  
 manned spacecraft  
 . **Salyut space station**  
 Soviet spacecraft  
 . **Salyut space station**  
 stations  
 . space stations  
 . . **Salyut space station**  
 RT Soyuz spacecraft  
 space bases  
 space laboratories  
 spacecraft docking  
 U.S.S.R. space program

*Samaritan aircraft*  
 USE **C-131 aircraft**

**samarium**  
 GS chemical elements  
 . rare earth elements  
 . . **samarium**  
 . . . samarium isotopes  
 metals  
 . rare earth elements  
 . . **samarium**  
 . . . samarium isotopes

**samarium compounds**  
 GS rare earth compounds  
 . **samarium compounds**  
 RT ∞ chemical compounds  
 ∞ metal compounds

**samarium isotopes**  
 GS chemical elements

. nuclides  
 . . isotopes  
 . . . **samarium isotopes**  
 . rare earth elements  
 . . samarium  
 . . . **samarium isotopes**  
 metals  
 . rare earth elements  
 . . samarium  
 . . . **samarium isotopes**

**Samoa**  
 GS landforms  
 . islands  
 . . Pacific islands  
 . . . **Samoa**

**Samos**  
 UF *Satellite and Missile Observation System*  
 GS artificial satellites  
 . **Samos**  
 military spacecraft  
 . reconnaissance spacecraft  
 . . **Samos**  
 RT satellite tracking

**sample return missions**  
 (added March 2001)  
 DEF Space missions to collect material samples from interplanetary space, a planet, or other body and return the samples to Earth.  
 GS space missions  
 . **sample return missions**  
 . . Mars sample return missions  
 . . Stardust Mission  
 RT samples  
 space exploration

**sampled data systems**  
 (added July 1990)  
 RT adaptive control  
 automatic control  
 control stability  
 control theory  
 data sampling  
 feedback control

**samplers**  
 UF *bombs (samplers)*  
*sampling devices*  
 RT ∞ bombs  
 core sampling  
 samples  
 sampling  
 selectors  
 ∞ test equipment

**samples**  
 DEF Physical or biological specimens intended to be representative of the whole.  
 GS **samples**  
 . Mars surface samples  
 RT acceptability  
 Mars sample return missions  
 sample return missions  
 samplers  
 sampling  
 specimens

**sampling**  
 DEF Obtaining of a portion representative of the material concerned.  
 GS **sampling**  
 . air sampling  
 . core sampling  
 . data sampling  
 . particulate sampling  
 . random sampling  
 . soil sampling  
 . water sampling  
 RT allowances  
 assaying  
 Bayes theorem  
 censored data (mathematics)  
 chemical analysis  
 chemical tests  
 collection  
 concentration (composition)  
 confidence limits

## San Andreas Fault

counting  
estimating  
exploration  
Global Air Sampling Program  
heterogeneity  
homogeneity  
inspection  
investigation  
probability theory  
process control (industry)  
quality control  
random errors  
reliability  
Rosetta mission  
samplers  
samples  
selection  
sequential analysis  
specimens  
standards  
statistical analysis  
∞ statistics  
∞ sweep circuits  
∞ tests  
variability  
Weibull density functions

*sampling devices*  
USE **samplers**

**San Andreas Fault**  
GS geological faults  
. **San Andreas Fault**  
RT California  
crustal fractures  
Earth crust  
earthquakes  
Mexico

**San Andreas Fault experiment**  
RT earthquakes  
geological faults

**San Francisco (CA)**  
GS cities  
. **San Francisco (CA)**  
RT California

**San Francisco Bay (CA)**  
GS bays (topographic features)  
. **San Francisco Bay (CA)**  
RT California  
Pacific Ocean  
San Pablo Bay (CA)

**San Joaquin Valley (CA)**  
GS valleys  
. **San Joaquin Valley (CA)**  
RT California  
river basins

**San Juan Mountains (CO)**  
GS landforms  
. mountains  
. . **San Juan Mountains (CO)**  
RT Colorado

**San Marco 1 satellite**  
GS artificial satellites  
. meteorological satellites  
. . San Marco satellites  
. . . **San Marco 1 satellite**

**San Marco 2 satellite**  
GS artificial satellites  
. meteorological satellites  
. . San Marco satellites  
. . . **San Marco 2 satellite**

**San Marco 3 satellite**  
GS artificial satellites  
. meteorological satellites  
. . San Marco satellites  
. . . **San Marco 3 satellite**

**San Marco satellites**  
GS artificial satellites  
. meteorological satellites  
. . **San Marco satellites**  
. . . San Marco 1 satellite  
. . . San Marco 2 satellite

. . . San Marco 3 satellite  
RT Scout launch vehicle

**San Marino**  
GS nations  
. **San Marino**  
RT Europe  
Italy

**San Pablo Bay (CA)**  
GS bays (topographic features)  
. **San Pablo Bay (CA)**  
RT California  
San Francisco Bay (CA)

**sand casting**  
GS forming techniques  
. casting  
. . **sand casting**  
RT molding materials  
sands

*sand dunes*  
USE **dunes**

**Sand Hills Region (GA-NC-SC)**  
GS regions  
. **Sand Hills Region (GA-NC-SC)**  
RT Georgia  
North Carolina  
South Carolina

**Sand Hills Region (NE)**  
GS regions  
. **Sand Hills Region (NE)**  
RT Nebraska

**Sandpiper target missile**  
GS missile configurations  
. **Sandpiper target missile**  
missiles  
. **Sandpiper target missile**  
RT drone vehicles  
targets

**sands**  
GS sediments  
. **sands**  
. . monazite sands  
. . tar sands  
soils  
. **sands**  
. . monazite sands  
. . tar sands  
RT aggregates  
alluvium  
aquifers  
deltas  
dunes  
dust  
Earth resources  
fans (landforms)  
gravels  
grit  
ilmenite  
littoral drift  
littoral transport  
molding materials  
porous materials  
quartz  
rain erosion  
reefs  
sand casting  
sandstones  
sedimentary rocks  
silica glass  
silicon dioxide

**sandstones**  
GS rocks  
. sedimentary rocks  
. . **sandstones**  
RT Earth resources  
sands  
schist

soils

*sandwich construction*  
USE **sandwich structures**

**sandwich structures**  
UF *sandwich construction*  
RT composite materials  
epoxy matrix composites  
honeycomb cores  
honeycomb structures  
interlayers  
laminates  
multilayer insulation  
ply orientation  
rigid structures  
∞ structures  
walls

*Sanger space transportation system*  
USE **Saenger space transportation system**

**sanitation**  
RT consumables (spacecrew supplies)  
health  
housekeeping (spacecraft)  
hygiene  
potable water  
public health  
sewers  
toilets  
warning systems  
waste disposal  
waste management

**Santowax (trademark)**  
RT polystyrene

**sapphire**  
GS aluminum compounds  
. aluminum oxides  
. . **sapphire**  
chalcogenides  
. oxides  
. . metal oxides  
. . . aluminum oxides  
. . . . **sapphire**

**saprophytes**  
GS plants (botany)  
. **saprophytes**  
RT bacteria  
microorganisms

**sarcina**  
GS microorganisms  
. bacteria  
. . **sarcina**

*sarcoma*  
USE **cancer**

**sarcoplasmic reticulum**  
GS organelles  
. endoplasmic reticulum  
. . **sarcoplasmic reticulum**  
RT cells (biology)  
cytology  
cytoplasm

**Sargasso Sea**  
DEF A region in the Atlantic characterized by mixing ocean currents and a lack of winds. Located northeast of the West Indies.  
RT Atlantic Ocean  
Gulf Stream  
ocean models  
ocean surface  
oceanography  
seas

**SarSat**  
DEF The US satellite of the COSPAS-SarSat project for the search and rescue of distressed vehicles, administered by USSR, US, French, and Canadian agencies. Used for Search and Rescue Satellite.  
UF *Search and Rescue Satellite*  
GS artificial satellites  
. **SarSat**

- RT COSPAS  
NOAA 8 satellite  
reconnaissance  
rescue operations  
searching
- SAS**
- UF *Small Astronomy Satellites*  
GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . **SAS**  
. . . . Explorer 53 satellite  
. . . . SAS-1  
. . . . SAS-2  
. . . . SAS-3  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . **SAS**  
. . . . Explorer 53 satellite  
. . . . SAS-1  
. . . . SAS-2  
. . . . SAS-3
- RT Explorer 48 satellite  
Uhuru satellite
- SAS-1**
- UF *Small Astronomy Satellite 1*  
GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-1**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-1**
- RT radio astronomy
- SAS-2**
- UF *Small Astronomy Satellite 2*  
GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-2**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-2**
- RT Explorer 48 satellite  
radio astronomy  
spaceborne astronomy
- SAS-3**
- UF *Small Astronomy Satellite 3*  
GS artificial satellites  
. scientific satellites  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-3**  
observatories  
. astronomical observatories  
. . . astronomical satellites  
. . . **SAS**  
. . . . **SAS-3**
- RT Explorer 53 satellite  
radio astronomy  
spaceborne astronomy  
x ray astronomy
- SAS-D**  
USE **IUE**
- Saskatchewan**  
GS nations  
. Canada  
. . **Saskatchewan**
- SATAN (sensor)**  
USE **terrain analysis**
- satellite altimetry**  
GS altimetry  
. **satellite altimetry**
- RT altimeters  
digital elevation models
- geodesy  
geodetic satellites  
geoids  
GEOS 3 satellite  
Geosat satellites  
Ice, Cloud and Land Elevation  
Satellite  
radar measurement  
satellite observation  
satellite-borne radar  
SEASAT satellites  
topography
- Satellite and Missile Observation System*  
USE **Samos**
- satellite antennas**  
GS antennas  
. **satellite antennas**
- RT furlable antennas  
multibeam antennas  
radio antennas  
telecommunication
- satellite atmospheres**  
DEF The atmospheres that are found on natural satellites.  
GS environments  
. extraterrestrial environments  
. . . **satellite atmospheres**  
. . . . lunar atmosphere  
. . . . Titan atmosphere
- RT  $\infty$  atmospheres  
atmospheric chemistry  
atmospheric composition  
atmospheric physics  
Earth atmosphere  
Earth ionosphere  
Earth magnetosphere  
Huygens probe  
ionospheric composition  
magnetopause  
natural satellites  
planetary atmospheres  
stellar atmospheres  
Titan  
Triton  
upper atmosphere
- satellite attitude control**  
GS attitude control  
. **satellite attitude control**  
spacecraft control  
. satellite control  
. . . **satellite attitude control**
- RT attitude stability  
automatic control  
 $\infty$  control  
directional control  
gravity gradient satellites  
jet control  
lateral control  
longitudinal control  
Marquardt R4D engine  
three axis stabilization  
Transit Attitude Control satellite
- satellite attitude disturbance*  
USE **attitude stability**  
**spacecraft stability**
- satellite breakup*  
USE **spacecraft breakup**
- satellite capture*  
USE **spacecraft recovery**
- satellite clusters*  
USE **satellite constellations**
- satellite communication**  
DEF Use of communication satellites, passive reflecting belts of dipoles or needles, or reflecting orbiting balloons to extend the range of radio communication by returning signals to Earth from the orbiting object, with or without amplification.  
GS telecommunication  
. space communication  
. . . spacecraft communication
- . . . **satellite communication**
- RT ACTS  
ARPA computer network  
astrionics  
circumlunar communication  
communication satellites  
Earth terminals  
facsimile communication  
free-space optical communication  
ground-air-ground communication  
hoop column antennas  
interplanetary communication  
Iridium network  
lunar communication  
multibeam antennas  
optical communication  
packet transmission  
plasma antennas  
radio communication  
satellite communications ships  
satellite ground support  
single channel per carrier  
transmission  
system generated electromagnetic pulses  
transmission rate (communications)  
unified S band
- satellite communications ships**  
UF *USNS Kingsport*  
GS surface vehicles  
. **satellite communications ships**  
water vehicles  
. ships  
. . **satellite communications ships**
- RT satellite communication  
spacecraft communication
- satellite configurations**  
GS spacecraft configurations  
. **satellite configurations**
- RT aerodynamic configurations
- satellite constellations**  
(added February 1994)  
UF *satellite clusters*  
GS networks  
. satellite networks  
. . **satellite constellations**  
. . . Constellation-X  
. . . Iridium network
- RT communication networks  
communication satellites  
formation flying  
Global Positioning System  
microsatellites  
nanosatellites  
satellite ground tracks  
satellite navigation systems  
spatial distribution  
stationkeeping
- satellite control**  
GS spacecraft control  
. **satellite control**  
. . . satellite attitude control
- RT attitude control  
automatic control  
 $\infty$  control  
directional control  
flexible spacecraft  
formation flying  
gravity gradient satellites  
jet control  
lateral control  
longitudinal control  
manual control  
remote control  
thrust control
- satellite defense*  
USE **spacecraft defense**
- satellite design**  
GS spacecraft design  
. **satellite design**
- RT computer aided design  
 $\infty$  design  
Indian space program  
Japanese space program



## satellite doppler positioning

microsattelites  
 nanosatellites  
 product development  
 small satellite technology  
 spacecraft structures  
 structural design  
 systems engineering

**satellite doppler positioning**  
 GS positioning  
 . **satellite doppler positioning**  
 RT Argos system  
 Doppler effect  
 Doppler navigation  
 Doppler radar  
 geodesy  
 geodetic accuracy  
 geodetic coordinates  
 geodetic satellites  
 geodetic surveys  
 polystation doppler tracking system  
 satellite tracking  
 tracking (position)

**satellite drag**  
 GS dynamic characteristics  
 . drag  
 . . **satellite drag**  
 RT aerodynamic drag  
 electrostatic drag  
 friction drag

*satellite fragmentation*  
 USE **spacecraft breakup**

**satellite ground support**  
 RT ground support equipment  
 satellite communication  
 spacecraft communication

**satellite ground tracks**  
 GS ground tracks  
 . **satellite ground tracks**  
 RT flight paths  
 orbits  
 satellite constellations

**satellite guidance**  
 GS guidance (motion)  
 . spacecraft guidance  
 . . **satellite guidance**  
 RT automatic control  
 inertial guidance  
 injection guidance  
 LOCATES system  
 manual control  
 reentry guidance  
 rendezvous guidance  
 space navigation

**satellite imagery**  
 GS imagery  
 . **satellite imagery**  
 RT atmospheric correction  
 Coastal Zone Color Scanner  
 data products  
 image analysis  
 imaging techniques  
 MISR (radiometry)  
 normalized difference vegetation  
 index  
 pixels  
 satellite observation  
 satellite-borne photography  
 vegetative index

**satellite instruments**  
 GS spacecraft instruments  
 . **satellite instruments**  
 . . multispectral linear arrays  
 RT flight instruments  
 ∞ instruments  
 laser altimeters  
 measuring instruments  
 needs (data system)  
 wildlife radiolocation

**satellite interceptors**  
 RT ∞ interceptors

pursuit tracking

**satellite laser ranging**  
*(added July 2001)*  
 DEF A technique for determining the distance to or from an artificial satellite by precise measurement of the time required for a laser pulse to travel from a transmitter to a retroreflector and return to a detector.  
 UF *SLR (ranging)*  
 GS rangefinding  
 . laser ranging  
 . . **satellite laser ranging**  
 utilization  
 . laser applications  
 . . laser ranging  
 . . . **satellite laser ranging**  
 RT celestial geodesy  
 geodetic satellites  
 LAGEOS (satellite)  
 laser range finders  
 passive satellites  
 retroreflection  
 retroreflectors  
 satellite tracking

*satellite launching*  
 USE **spacecraft launching**

**satellite lifetime**  
 GS life (durability)  
 . **satellite lifetime**  
 RT orbit decay  
 spacecraft reentry

*satellite maneuvers*  
 USE **spacecraft maneuvers**

**satellite navigation systems**  
 GS **satellite navigation systems**  
 . Global Positioning System  
 . GLONASS  
 . Transit navigation system  
 RT autonomous navigation  
 navigation satellites  
 radar navigation  
 radio navigation  
 satellite constellations  
 space navigation  
 ∞ systems

**satellite networks**  
 SN (NETWORKS INCORPORATING SATELLITES)  
 GS networks  
 . **satellite networks**  
 . . Argos system  
 . . satellite constellations  
 . . . Constellation-X  
 . . . Iridium network  
 . . VSAT (network)  
 RT aeronautical satellites  
 Aerosat satellites  
 code division multiple access  
 communication networks  
 communication satellites  
 ComStar satellites  
 demand assignment multiple access  
 domestic satellite communications  
 systems  
 formation flying  
 HET experiment  
 L-Sat  
 Marecs maritime satellites  
 military spacecraft  
 Molniya satellites  
 multimission modular spacecraft  
 navigation satellites  
 NAVSTAR satellites  
 network control  
 Skynet satellites  
 TDR satellites  
 teleconferencing  
 time division multiple access

**satellite observation**  
 SN (OBSERVATION OF THE EARTH BY SATELLITE)  
 GS observation  
 . Earth observations (from space)  
 . . **satellite observation**

RT arc clouds  
 Earth Resources Program  
 Envisat-1 satellite  
 EOS data and information system  
 EROS (satellites)  
 ESSA satellites  
 FIRE (climatology)  
 Glory Mission satellite  
 GRACE mission  
 IRIS satellites  
 ISCCP Project  
 Landsat satellites  
 meteorological satellites  
 METEOSAT satellite  
 MISR (radiometry)  
 Nimbus project  
 Nimbus satellites  
 NOAA 19 satellite  
 satellite altimetry  
 satellite imagery  
 SIRS B satellite  
 spaceborne photography  
 Surface Meteorology and Solar  
 Energy project  
 Surface Radiation Budget project  
 swath width  
 Synchronous Earth Observatory  
 satellite  
 TIROS operational satellite system  
 TIROS satellites  
 TOPEX  
 Uhuru satellite  
 vegetative index  
 Vela satellites  
 wildlife radiolocation

*satellite oceans*  
*(added June 2001)*  
 USE **extraterrestrial oceans**

*satellite orbit calculation*  
 USE **orbit calculation**

**satellite orbits**  
 SN (LIMITED TO ORBITS OF ARTIFICIAL SATELLITES)  
 GS orbits  
 . spacecraft orbits  
 . . **satellite orbits**  
 . . . geosynchronous orbits  
 . . . parking orbits  
 . . . stationary orbits  
 . . . twenty-four hour orbits  
 RT circular orbits  
 Earth orbits  
 elliptical orbits  
 equatorial orbits  
 Lissajous figures  
 low Earth orbits  
 lunar orbits  
 orbit insertion  
 orbit spectrum utilization  
 orbital mechanics  
 orbital position estimation  
 orbital resonances (celestial mechanics)  
 planetary orbits  
 retrograde orbits  
 transfer orbits

**satellite orientation**  
 GS attitude (inclination)  
 . **satellite orientation**  
 RT flexible spacecraft  
 image dissector tubes  
 spin stabilization  
 three axis stabilization

**satellite perturbation**  
 GS perturbation  
 . orbit perturbation  
 . . **satellite perturbation**  
 RT Discos (satellite attitude control)  
 gravitational fields  
 orbital mechanics  
 Schach effect  
 spacecraft stability

- tesseral harmonics
- satellite power transmission**  
(added November 1989)  
GS power beaming  
  . **satellite power transmission**  
RT laser power beaming  
  microwave power beaming  
  rectennas  
  solar arrays  
  solar cells  
  solar power satellites
- satellite rendezvous*  
USE **orbital rendezvous**
- satellite repair*  
USE **orbital servicing**
- satellite rotation**  
GS gyration  
  . rotation  
  . . **satellite rotation**  
RT flexible spacecraft  
  spin reduction  
  spin stabilization  
  tumbling motion  
  yo-yo devices
- satellite solar energy conversion**  
GS energy conversion  
  . **satellite solar energy conversion**  
RT ∞ conversion  
  microwave transmission  
  microwaves  
  power conditioning  
  solar cells  
  sun
- satellite solar power stations**  
RT energy conversion  
  microwave transmission  
  microwaves  
  power conditioning  
  solar cells  
  sun
- satellite sounding**  
GS sounding  
  . **satellite sounding**  
RT Advanced Microwave Sounding Unit  
  artificial satellites  
  atmospheric sounding  
  ionosondes  
  ionospheric sounding  
  meteorological satellites  
  NOAA 19 satellite  
  NPOESS  
  radiosondes  
  rocket sounding  
  visible infrared spin scan radiometer
- satellite surfaces**  
SN (RESTRICTED TO NATURAL SATELLITES)  
DEF The crust and soil of natural satellites.  
GS **satellite surfaces**  
  . lunar surface  
RT craters  
  extraterrestrial oceans  
  icy satellites  
  Mercury surface  
  natural satellites  
∞ surfaces  
  terrain analysis
- satellite television**  
GS communication equipment  
  . spacecraft television  
  . . **satellite television**  
  telecommunication  
  . spacecraft television  
  . . **satellite television**  
  television systems  
  . spacecraft television  
  . . **satellite television**  
RT color television  
  direct broadcast satellites  
  meteorological satellites  
  space probes  
  stereotelevision
- Symphonie satellites  
television cameras  
television transmission
- satellite temperature**  
GS spacecraft temperature  
  . **satellite temperature**  
  temperature  
  . **satellite temperature**  
RT ambient temperature  
  radiative heat transfer  
  solar radiation shielding  
  spacecraft design  
  spacecraft environments  
  temperature distribution  
  temperature measurement  
  thermal environments
- satellite tracking**  
GS tracking (position)  
  . spacecraft tracking  
  . . **satellite tracking**  
  . . . satellite-to-satellite tracking  
RT cinetheodolites  
  Global Tracking Network  
  International Satellite Geodesy  
  Experiment  
  laser target designators  
  minitrack system  
  optical satellite tracking program  
  orbit determination  
  photographic tracking  
  range and range rate tracking  
  Samos  
  satellite doppler positioning  
  satellite laser ranging  
  Space Flight Tracking and Data  
  Network  
  STDN (network)  
  tracking networks  
  tracking stations  
  transponder control group
- Satellite Tracking and Data Acq Network*  
USE **STDN (network)**
- satellite transmission**  
GS transmission  
  . signal transmission  
  . . **satellite transmission**  
RT Aloha system  
  binary phase shift keying  
  code division multiplexing  
  data transmission  
  direct broadcast satellites  
  domestic satellite communications  
  systems  
  downlinking  
  Earth terminals  
  frequency division multiplexing  
  frequency reuse  
  MSAT  
  multiplexing  
  pulse communication  
  quadrature phase shift keying  
  radio transmission  
  single channel per carrier  
  transmission  
  spacecraft television  
  TDR satellites  
  television transmission  
  uplinking
- satellite-borne instruments**  
GS measuring instruments  
  . **satellite-borne instruments**  
  . . Advanced Microwave Sounding  
  Unit  
  . . Advanced Very High Resolution  
  Radiometer  
  . . AMPS (satellite payload)  
  . . MISR (radiometry)  
  . . Total Ozone Mapping Spectrometer  
RT AMPTE (satellites)  
  data products  
  DIAL satellite  
  infrared radiometers  
  instrument packages  
∞ instruments  
  OPEN Project
- particle telescopes  
radiation detectors  
remote sensors  
Sea-viewing Wide Field-of-view  
Sensor  
single event upsets  
Solar Backscatter UV Spectrometer  
visible infrared spin scan radiometer
- satellite-borne photography**  
GS imagery  
  . photography  
  . . spaceborne photography  
  . . . **satellite-borne photography**  
RT aerial photography  
  astronomical photography  
  black and white photography  
  DMSP satellites  
  forest fire detection  
  geographic applications program  
  infrared photography  
  Mars photographs  
  photomapping  
  photomaps  
  rocket-borne photography  
  satellite imagery  
  space surveillance (spaceborne)  
  spectral reconnaissance  
  timber inventory
- satellite-borne radar**  
GS radar  
  . **satellite-borne radar**  
RT Envisat-1 satellite  
  radar detection  
  satellite altimetry  
  search radar  
  surveillance radar  
  synthetic aperture radar  
  tracking radar
- ∞ **satellites**  
SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
DEF Any objects, man-made or natural, that  
orbit celestial bodies.  
RT artificial satellites  
  natural satellites  
∞ spacecraft
- satellite-to-satellite tracking**  
GS tracking (position)  
  . spacecraft tracking  
  . . satellite tracking  
  . . . **satellite-to-satellite tracking**  
RT space surveillance (spaceborne)  
  tracking networks
- saturable reactors**  
UF *SR (reactors)*  
GS electric reactors  
  . **saturable reactors**  
RT magnet coils  
  magnetic amplifiers  
  magnetic circuits  
  magnetic cores  
  magnetic switching  
  power reactors  
  transformers
- saturated hydrocarbons*  
USE **alkanes**
- ∞ **saturation**  
SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT concentration (composition)  
  condensing  
  crowding  
  desaturation  
  penetration  
  permeating  
  precipitation (chemistry)  
  precipitation (meteorology)  
  unsaturation (chemistry)  
  wetting
- saturation (chemistry)**  
DEF The state of a solution when it holds

## Saturn

the maximum equilibrium quantity of dissolved matter at a given temperature.

- RT chemical bonds
- ∞ chemistry
- dew point
- precipitation (chemistry)
- unsaturation (chemistry)

### ∞ Saturn

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT Saturn (planet)
- Saturn project

### Saturn 1 launch vehicles

- GS launch vehicles
  - . Saturn launch vehicles
  - .. **Saturn 1 launch vehicles**
    - ... Saturn 1 SA-1 launch vehicle
    - ... Saturn 1 SA-10 launch vehicle
    - ... Saturn 1 SA-2 launch vehicle
    - ... Saturn 1 SA-3 launch vehicle
    - ... Saturn 1 SA-4 launch vehicle
    - ... Saturn 1 SA-5 launch vehicle
    - ... Saturn 1 SA-6 launch vehicle
    - ... Saturn 1 SA-7 launch vehicle
    - ... Saturn 1 SA-8 launch vehicle
    - ... Saturn 1 SA-9 launch vehicle
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... **Saturn 1 launch vehicles**
      - .... Saturn 1 SA-1 launch vehicle
      - .... Saturn 1 SA-10 launch vehicle
      - .... Saturn 1 SA-2 launch vehicle
      - .... Saturn 1 SA-3 launch vehicle
      - .... Saturn 1 SA-4 launch vehicle
      - .... Saturn 1 SA-5 launch vehicle
      - .... Saturn 1 SA-6 launch vehicle
      - .... Saturn 1 SA-7 launch vehicle
      - .... Saturn 1 SA-8 launch vehicle
      - .... Saturn 1 SA-9 launch vehicle
- RT H-1 engine
- M-1 engine

### Saturn 1 SA-1 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-1 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-1 launch vehicle**

### Saturn 1 SA-10 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-10 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-10 launch vehicle**

### Saturn 1 SA-2 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-2 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-2 launch vehicle**

### Saturn 1 SA-3 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-3 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles

### ... Saturn 1 SA-3 launch vehicle

### Saturn 1 SA-4 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-4 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-4 launch vehicle**

### Saturn 1 SA-5 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-5 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-5 launch vehicle**

### Saturn 1 SA-6 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-6 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-6 launch vehicle**

### Saturn 1 SA-7 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-7 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-7 launch vehicle**

### Saturn 1 SA-8 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-8 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-8 launch vehicle**

### Saturn 1 SA-9 launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. Saturn 1 launch vehicles
  - ... **Saturn 1 SA-9 launch vehicle**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... Saturn 1 launch vehicles
    - .... **Saturn 1 SA-9 launch vehicle**

### Saturn 1 workshop

- GS artificial satellites
  - . orbital workshops
  - .. Saturn workshops
  - ... **Saturn 1 workshop**
  - manned spacecraft
    - . orbital workshops
    - .. Saturn workshops
    - ... **Saturn 1 workshop**
- RT airlock modules
  - Apollo applications program
  - Apollo project
  - multiple docking adapters
  - Skylab program
  - space stations

### Saturn 1B launch vehicles

- GS launch vehicles
  - . Saturn launch vehicles
  - .. **Saturn 1B launch vehicles**
  - rocket vehicles
    - . multistage rocket vehicles

### .. Saturn launch vehicles

- ... **Saturn 1B launch vehicles**
- RT H-1 engine
- J-2 engine
- M-1 engine
- Skylab 2
- Skylab 3
- Skylab 4

### Saturn 2 launch vehicles

- GS launch vehicles
  - . Saturn launch vehicles
  - .. **Saturn 2 launch vehicles**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... **Saturn 2 launch vehicles**

### Saturn 5 launch vehicles

- GS launch vehicles
  - . Saturn launch vehicles
  - .. **Saturn 5 launch vehicles**
  - rocket vehicles
    - . multistage rocket vehicles
    - .. Saturn launch vehicles
    - ... **Saturn 5 launch vehicles**
- RT J-2 engine
- Skylab 2
- Skylab 3
- Skylab 4

### Saturn 5 workshop

- GS artificial satellites
  - . orbital workshops
  - .. Saturn workshops
  - ... **Saturn 5 workshop**
  - manned spacecraft
    - . orbital workshops
    - .. Saturn workshops
    - ... **Saturn 5 workshop**
- RT airlock modules
  - Apollo applications program
  - Apollo project
  - multiple docking adapters
  - Skylab program
  - space stations

### Saturn (planet)

- GS celestial bodies
  - . planets
  - .. gas giant planets
  - ... **Saturn (planet)**
- RT Calypso
- Cassini mission
- Dione
- Enceladus
- Epimetheus
- Helene
- Hyperion
- Iapetus
- Janus
- Mimas
- Pandora
- Phoebe
- Prometheus
- Rhea (astronomy)
- ∞ Saturn
  - Telesto
  - Tethys
  - Titan
  - Titan atmosphere
  - Voyager 2 spacecraft

### Saturn atmosphere

- DEF The outer shell of gas surrounding the planet Saturn.
- GS environments
  - . extraterrestrial environments
  - .. planetary environments
  - ... planetary atmospheres
  - .... **Saturn atmosphere**
- RT atmospheric composition
- planetary ionospheres
- planetary radiation

### Saturn D launch vehicle

- GS launch vehicles
  - . Saturn launch vehicles
  - .. **Saturn D launch vehicle**
  - rocket vehicles

- . multistage rocket vehicles
- .. Saturn launch vehicles
- ... **Saturn D launch vehicle**
- RT RL-10-A-3 engine
- Saturn launch vehicles**
- GS launch vehicles
  - . **Saturn launch vehicles**
  - .. Saturn 1 launch vehicles
  - ... Saturn 1 SA-1 launch vehicle
  - ... Saturn 1 SA-10 launch vehicle
  - ... Saturn 1 SA-2 launch vehicle
  - ... Saturn 1 SA-3 launch vehicle
  - ... Saturn 1 SA-4 launch vehicle
  - ... Saturn 1 SA-5 launch vehicle
  - ... Saturn 1 SA-6 launch vehicle
  - ... Saturn 1 SA-7 launch vehicle
  - ... Saturn 1 SA-8 launch vehicle
  - ... Saturn 1 SA-9 launch vehicle
  - .. Saturn 1B launch vehicles
  - .. Saturn 2 launch vehicles
  - .. Saturn 5 launch vehicles
  - .. Saturn D launch vehicle
  - rocket vehicles
  - . multistage rocket vehicles
  - .. **Saturn launch vehicles**
  - ... Saturn 1 launch vehicles
  - ... Saturn 1 SA-1 launch vehicle
  - ... Saturn 1 SA-10 launch vehicle
  - ... Saturn 1 SA-2 launch vehicle
  - ... Saturn 1 SA-3 launch vehicle
  - ... Saturn 1 SA-4 launch vehicle
  - ... Saturn 1 SA-5 launch vehicle
  - ... Saturn 1 SA-6 launch vehicle
  - ... Saturn 1 SA-7 launch vehicle
  - ... Saturn 1 SA-8 launch vehicle
  - ... Saturn 1 SA-9 launch vehicle
  - .. Saturn 1B launch vehicles
  - .. Saturn 2 launch vehicles
  - .. Saturn 5 launch vehicles
  - .. Saturn D launch vehicle
- RT Apollo project
  - F-1 rocket engine
  - RL-10 engines
  - ∞ vehicles
- Saturn project**
- GS programs
  - . NASA programs
  - . NASA space programs
  - ... **Saturn project**
  - . projects
  - .. **Saturn project**
  - . space programs
  - .. NASA space programs
  - ... **Saturn project**
- RT Apollo applications program
  - Apollo spacecraft
  - Centaur launch vehicle
  - launch vehicles
  - lunar launch
  - Pegasus satellites
  - RIFT (reactor in flight test)
  - ∞ Saturn
  - Voyager project
- Saturn rings**
- GS celestial bodies
  - . planetary rings
  - .. **Saturn rings**
- RT gas giant planets
  - Jupiter rings
  - moonlets
  - natural satellites
  - planetary atmospheres
  - planetary composition
  - planetary surfaces
  - planetary temperature
  - planetology
  - planets
  - ∞ rings
  - solar system
  - Uranus rings
- Saturn S-1 stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-1 stage**
- RT liquid propellant rocket engines
- Saturn S-1B stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-1B stage**
- RT liquid propellant rocket engines
- Saturn S-1C stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-1C stage**
- RT liquid propellant rocket engines
- Saturn S-2 stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-2 stage**
- RT liquid propellant rocket engines
- Saturn S-4 stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-4 stage**
- RT liquid propellant rocket engines
- Saturn S-4B stage**
- GS rocket vehicles
  - . Saturn stages
  - .. **Saturn S-4B stage**
- RT liquid propellant rocket engines
- Saturn satellites**
- DEF The natural satellites of the planet Saturn.
- GS celestial bodies
  - . natural satellites
  - .. **Saturn satellites**
  - ... Calypso
  - ... Dione
  - ... Enceladus
  - ... Epimetheus
  - ... Helene
  - ... Hyperion
  - ... Iapetus
  - ... Janus
  - ... Mimas
  - ... Pandora
  - ... Phoebe
  - ... Prometheus
  - ... Rhea (astronomy)
  - ... Teleso
  - ... Tethys
  - ... Titan
- RT icy satellites
- Saturn stages**
- GS rocket vehicles
  - . **Saturn stages**
  - .. Saturn S-1 stage
  - .. Saturn S-1B stage
  - .. Saturn S-1C stage
  - .. Saturn S-2 stage
  - .. Saturn S-4 stage
  - .. Saturn S-4B stage
- RT liquid propellant rocket engines
- Saturn workshops**
- GS artificial satellites
  - . orbital workshops
  - .. **Saturn workshops**
  - ... Saturn 1 workshop
  - ... Saturn 5 workshop
  - manned spacecraft
  - . orbital workshops
  - .. **Saturn workshops**
  - ... Saturn 1 workshop
  - ... Saturn 5 workshop
- RT airlock modules
  - Apollo applications program
  - Apollo project
  - multiple docking adapters
  - Skylab program
  - space stations
- Saudi Arabia**
- GS nations
  - . **Saudi Arabia**
- RT Asia
  - Saudi Arabian space program
- Saudi Arabian space program**
- GS programs
  - . space programs
  - .. **Saudi Arabian space program**
- RT Arabsat
  - Arcomsat
  - Saudi Arabia
  - Space Shuttle mission 51-G
- Savage aircraft*
- USE **A-2 aircraft**
- Savannah nuclear ship**
- GS surface vehicles
  - . cargo ships
  - .. **Savannah nuclear ship**
  - . nuclear powered ships
  - .. **Savannah nuclear ship**
  - water vehicles
  - . ships
  - .. cargo ships
  - ... **Savannah nuclear ship**
  - . nuclear powered ships
  - ... **Savannah nuclear ship**
- RT marine propulsion
  - nuclear propulsion
- savannahs*
- USE **grasslands**
- S-A-W devices*
- USE **surface acoustic wave devices**
- saws**
- GS cutters
  - . **saws**
  - tools
  - . **saws**
- RT machine tools
  - shears
- sawtooth waveforms**
- GS waveforms
  - . **sawtooth waveforms**
- RT pulse amplitude
  - pulse duration
  - square waves
- SC-1 aircraft**
- UF *Short SC-1 aircraft*
- GS jet aircraft
  - . **SC-1 aircraft**
  - monoplanes
  - . **SC-1 aircraft**
  - research vehicles
  - . research aircraft
  - .. **SC-1 aircraft**
  - tailless aircraft
  - . **SC-1 aircraft**
  - V/STOL aircraft
  - . vertical takeoff aircraft
  - .. **SC-1 aircraft**
- RT ∞ aircraft
- SC-5 aircraft**
- UF *Belfast aircraft*
  - Short Belfast C MK-1 aircraft*
  - Short SC-5 aircraft*
- GS jet aircraft
  - . turboprop aircraft
  - .. **SC-5 aircraft**
  - monoplanes
  - . **SC-5 aircraft**
  - transport aircraft
  - . **SC-5 aircraft**
- RT ∞ aircraft
- SC-7 aircraft**
- UF *Short SC-7 aircraft*
  - Skyvan aircraft*
  - Turbo-Skyvan aircraft*
- GS light aircraft
  - . **SC-7 aircraft**
  - monoplanes
  - . **SC-7 aircraft**
  - transport aircraft
  - . **SC-7 aircraft**
- RT ∞ aircraft

## scalars

cargo aircraft  
passenger aircraft

*scalar magnetic charge*  
USE **magnetic charge density**

### scalars

DEF Any physical quantity whose field can be described by a single numerical value at each point in space.

RT tensor analysis  
tensors

### ∞ scale

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT scale (corrosion)  
scale (ratio)  
temperature scales  
weight indicators

### scale (corrosion)

GS corrosion  
. **scale (corrosion)**  
RT chemical attack  
degradation  
descaling  
hot corrosion  
pickling (metallurgy)  
rusting  
∞ scale  
∞ scaling

### scale (ratio)

GS ratios  
. **scale (ratio)**  
RT mapping  
reticles  
∞ scale

### scale effect

DEF Any variation in the nature of the flow and in the force coefficients associated with a change in value of the Reynolds number, i.e., caused by change in size without change in shape.

RT ∞ effects  
force distribution  
multiscale models  
parameterization  
Reynolds number  
∞ scaling

### scale height

DEF A measure of the relationship between density and temperature at any point in the atmosphere.

GS dimensions  
. height  
. . **scale height**  
RT Earth atmosphere  
geopotential height  
head (fluid mechanics)

### scale models

DEF Three-dimensional representations of objects or structures containing all parts in the same proportion as their true size.

GS models  
. **scale models**  
RT aerodynamic configurations  
aircraft models  
multiscale models  
Reynolds equation  
scaling laws  
semispan models  
similarity theorem  
similitude law  
spacecraft models  
wind tunnel models

### scalars

DEF Devices that produce output pulses whenever a prescribed number of input pulses have been received.

GS circuits  
. counting circuits  
. . **scalars**

RT tensor analysis

### ∞ scaling

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT calibrating  
errors  
scale (corrosion)  
scale effect  
scaling laws

### scaling laws

GS laws  
. **scaling laws**  
RT dimensional analysis  
dimensionless numbers  
scale models  
∞ scaling  
similarity numbers  
wind tunnel calibration

### scaloping

RT edges  
electron beams  
traveling wave tubes

### Scandinavia

RT Denmark  
Finland  
Norway  
Sweden

### scandium

GS chemical elements  
. rare earth elements  
. . **scandium**  
. . . scandium isotopes  
metals  
. rare earth elements  
. . **scandium**  
. . . scandium isotopes  
. transition metals  
. . **scandium**  
. . . scandium isotopes

### *scandium 46*

USE **scandium isotopes**

### scandium compounds

GS rare earth compounds  
. **scandium compounds**  
. . scandium oxides  
RT ∞ chemical compounds  
∞ Group 3B compounds  
∞ metal compounds

### scandium isotopes

UF *scandium 46*  
GS chemical elements  
. nuclides  
. . isotopes  
. . . **scandium isotopes**  
. rare earth elements  
. . scandium  
. . . **scandium isotopes**  
metals  
. rare earth elements  
. . scandium  
. . . **scandium isotopes**  
. transition metals  
. . scandium  
. . . **scandium isotopes**

### scandium oxides

GS chalcogenides  
. oxides  
. . metal oxides  
. . . **scandium oxides**  
rare earth compounds  
. scandium compounds  
. . **scandium oxides**

### Scanner project

GS programs  
. projects  
. . **Scanner project**  
RT horizon scanners  
infrared scanners

optical equipment

### scanners

DEF Radar mechanisms incorporating such things as rotatable antennas, radiators, motor drives, or mountings for directing a searching radar beam through space and imparting target information to an indicator. Used for scanning devices.

UF *scanning devices*

### GS scanners

. horizon scanners  
. infrared scanners  
. ocean color scanner  
. . Coastal Zone Color Scanner  
. . Sea-viewing Wide Field-of-view  
Sensor

. optical scanners  
. . flying spot scanners  
. . multispectral band scanners  
. . . thematic mappers (LANDSAT)  
. ultrasonic scanners

### RT

conical scanning  
optical data processing  
optical equipment  
panoramic scanning  
reading  
scanning  
subreflectors

### scanning

DEF In radar, the motion of the antenna assembly when searching for targets.

### GS scanning

. conical scanning  
. frequency scanning  
. panoramic scanning  
. radar scanning  
. raster scanning

### RT

Earth resources  
EROS (satellites)  
examination  
monitors  
multispectral band scanners  
rapid ballistics identification  
reading  
scanners  
searching  
surveillance  
ultrasonic scanners

### *scanning devices*

USE **scanners**

### scanning electron microscopy

(added September 1992)

DEF A type of electron microscopy in which a beam of electrons, a few hundred angstroms in diameter, systematically sweeps over the specimen. The intensity of secondary electrons generated at the point of impact of the beam on the specimen is measured and the resulting signal is fed into a cathode-ray-tube display which is scanned in synchronism with the scanning of the specimen.

UF *SEM (microscopy)*

### GS microscopy

. electron microscopy  
. . **scanning electron microscopy**

### RT

electron beams  
electron microscopes  
field emission  
ion microscopes  
magnetic lenses  
microanalysis  
phase contrast  
secondary emission

### *scanning laser acoustic microscope (SLAM)*

USE **acoustic microscopes**

### scanning tunneling microscopy

(added October 1988)

### GS microscopy

. electron microscopy  
. . **scanning tunneling microscopy**

### RT

electron microscopes  
electron tunneling  
nanofabrication

transmission electron microscopy

**scapula**

- GS anatomy
  - . musculoskeletal system
  - . . bones
  - . . . **scapula**
- RT arm (anatomy)
  - shoulders

**SCAR program**

USE **supersonic cruise aircraft research**

**scarf joints**

(added March 1998)

DEF A joint in which the overlapping parts are tapered to form a continuous length, with no increase in dimension at the joint.

- GS joints (junctions)
  - . **scarf joints**
- RT bolted joints
  - bonded joints
  - lap joints
  - metal joints
  - scarfing

**scarfing**

- GS cutting
  - . **scarfing**
- RT cleaning
  - grinding (material removal)
  - metal cutting
  - scarf joints
  - slicing

**scarp**

USE **escarpments**

**scars**

- GS tissues (biology)
  - . **scars**

**scars (geology)**

USE **erosion**

**SCAT**

USE **supersonic commercial air transport**

**SCATHA satellite**

DEF Satellite for investigating spacecraft charging at high altitudes. A joint NASA-Air Force venture. Used for P78-2 satellite.

- UF *P78-2 satellite*
  - Spacecraft Charging at High Altitude*
- GS artificial satellites
  - . scientific satellites
  - . . **SCATHA satellite**
- RT ∞ charging
  - electric charge
  - electromagnetic interference
  - electrostatic charge
  - electrostatic probes
  - electrostatic shielding
  - high energy electrons

**scatter plates (optics)**

DEF Holograms of diffusing screens for scattering incident light by the process of diffraction.

- GS optical equipment
  - . **scatter plates (optics)**
- RT beam splitters
  - coherent light
  - holographic interferometry
  - holography
  - interferometry
  - light scattering
- ∞ optics
- ∞ plates
  - speckle holography
  - speckle interferometry

**scatter propagation**

DEF Specifically, the long-range propagation of radio signals by scattering due to index of refraction inhomogeneities in the lower atmosphere.

- GS transmission
  - . electromagnetic wave transmission
  - . . **scatter propagation**

- . . . ionospheric F-scatter propagation
- . wave propagation
- . . **scatter propagation**
- . . . ionospheric F-scatter propagation
- RT backscattering
  - forward scattering
  - ionospheric propagation
  - meteor trails
  - radio reception
  - radio scattering
  - radio transmission
  - radio waves

**scatterers**

USE **scattering**

**scattering**

DEF The process by which small particles suspended in a medium of a different index of diffraction diffuse a portion of the incident radiation in all directions. In scattering, no energy transformation results, only a change in the spatial distribution of the radiation. Used for scatterers.

- UF **scatterers**
- GS **scattering**

- . backscattering
- . coherent scattering
- . Compton effect
- . elastic scattering
- . electron scattering
- . . electron runaway (plasma physics)
- . forward scattering
- . incoherent scattering
- . inelastic scattering
- . inverse scattering
- . ion scattering
- . nuclear scattering
- . . neutron scattering
- . . resonance scattering
- . nucleon-nucleon scattering
- . proton scattering
- . radar scattering
- . radio scattering
  - . . microwave scattering
  - . wave scattering
  - . . acoustic scattering
  - . . . reverberation
  - . . atmospheric scattering
  - . . . tropospheric scattering
  - . . electromagnetic scattering
  - . . . ionospheric F-scatter propagation
  - . . . light scattering
  - . . . . halos
  - . . . microwave scattering
  - . . . Mie scattering
  - . . . . Rayleigh scattering
  - . . . Raman spectra
  - . . . Thomson scattering
  - . . . x ray scattering

RT

- atomic collisions
- bistatic reflectivity
- circumsolar radiation
- collision parameters
- collisions
- deep scattering layers
- deflection
- diffusion
- dispersing
- electromagnetic radiation
- encounters
- Huygens principle
- impingement
- incident radiation
- inelastic collisions
- mean free path
- particle collisions
- pomerons
- reflection
- releasing
- scatterometers
- shock wave interaction
- spread reflection
- spreading
- sprinkling
- statistical distributions
- transmittance
- wave degradation
- wave dispersion

wave interaction

**scattering amplitude**

- GS amplitudes
  - . **scattering amplitude**
- RT Faddeev equations
  - Mandelstam representation
  - wave scattering

**scattering coefficients**

- DEF Measures of the attenuation due to scattering of radiation as it traverses a medium containing scattering particles.
- GS coefficients
  - . **scattering coefficients**
- RT absorptivity
  - attenuation coefficients
  - form factors

**scattering cross sections**

DEF The hypothetical areas normal to the incident radiation that would geometrically intercept the total amount of radiation actually scattered by a scattering particle. They are also defined, equivalently, as the cross section areas of isotropic scatterers (spheres) which would scatter the same amount of radiation as the actual amount.

- RT absorption cross sections
  - baryon resonance
  - Born approximation
  - ∞ cross sections
  - electron runaway (plasma physics)
  - ionization cross sections
  - neutron cross sections
  - Pomeranchuk theorem
  - pomerons
  - Ramsauer effect
  - Regge poles
  - S matrix theory
  - stopping power

**scattering functions**

- DEF The intensities of scattered radiation in a given direction per lumen of flux incident upon the scattering material.
- RT flux density
  - ∞ functions
  - radiant flux density

**scattering matrix**

USE **S matrix theory**

**scatterometers**

- GS measuring instruments
  - . **scatterometers**
- RT ∞ instruments
  - microwave scattering
  - microwaves
  - QuikSCAT satellite
  - radar
  - radar scattering
  - scattering
  - wave scattering

**scavenging**

- RT cleaning
  - degassing
  - deoxidizing
  - purification

**SCCF**

USE **Solar Cell Calibration Facility**

**scene analysis**

- GS data processing
  - . **scene analysis**
- RT change detection
  - character recognition
  - edge detection
  - Feature Identification and Location
    - Exper
  - image analysis
  - imagery
  - imaging techniques
  - optical flow (image analysis)

## scene generation

video landmark acquisition and tracking

### scene generation

(added July 1998)

GS imaging techniques  
. **scene generation**  
simulation  
. **scene generation**  
RT computer graphics  
flight simulation  
image reconstruction  
scientific visualization  
target simulators

### scenedesmus

GS plants (botany)  
. algae  
.. **scenedesmus**

### SCF

USE **self consistent fields**

### Schach effect

DEF When a slowly or nonrotating satellite is heated on its sunward side, the photons of thermal radiation carry away more momentum from the hot sunward side than the cold shadowed side, thereby giving the satellite a certain net acceleration in the direction away from the sun. This effect was discovered by Milton Schach in the course of an investigation of unknown perturbations in the LAGEOS satellite.

RT celestial mechanics  
∞ effects  
orbit perturbation  
perturbation  
satellite perturbation

### Schauder fixpoint theorem

GS theorems  
. **Schauder fixpoint theorem**  
RT complex variables  
differential equations

### schedules

GS **schedules**  
. countdown  
RT contract management  
precision  
predictions  
production planning  
time  
time lag  
turnaround (STS)

### scheduling

GS **scheduling**  
. prediction analysis techniques  
. programming (scheduling)  
.. thrust programming  
. observation scheduling  
RT calendars  
consecutive events  
continuity  
∞ control  
crop calendars  
decision theory  
forecasting  
lateness  
mathematical models  
matrix management  
mission planning  
optimization  
production engineering  
quality control  
sequencing  
task complexity  
task planning (robotics)  
tasks  
time series analysis

### scheelite

GS calcium compounds  
. **scheelite**  
chalcogenides  
. oxides  
.. metal oxides  
... tungsten oxides  
... **scheelite**

minerals  
. **scheelite**  
tungsten compounds  
. tungsten oxides  
.. **scheelite**

### Schelkunoff principle

RT antenna radiation patterns  
horn antennas  
Huygens principle  
reflectometers  
reflectors

### schematics

USE **circuit diagrams**

### Schiff bases

USE **imines**

### schist

DEF A strongly foliated crystalline rock formed by dynamic metamorphism which can be readily split into thin flakes or slabs due to the well developed parallelism of more than 508 of the minerals present.

GS rocks  
. **schist**  
RT limestone  
sandstones

### schizophrenia

GS psychoses  
. **schizophrenia**  
RT ∞ depression  
irrationality  
mental health

### Schleicher aircraft

RT ∞ aircraft  
gliders

### Schlieren photography

DEF A method of photography for flow patterns that takes advantage of the fact that light passing through a density gradient in a gas is refracted as though it were passing through a prism.

GS imagery  
. photography  
.. shadowgraph photography  
... **Schlieren photography**  
RT black and white photography  
differential interferometry  
flow visualization  
Mach-Zehnder interferometers  
Moire effects

### Schmidt cameras

GS optical equipment  
. cameras  
.. **Schmidt cameras**  
photographic equipment  
. cameras  
.. **Schmidt cameras**  
RT astronomical photography  
Baker-Nunn camera  
telescopes

### Schmidt method

RT differential equations  
integral equations  
∞ methodology  
real variables

### Schmidt number

GS dimensionless numbers  
. **Schmidt number**  
ratios  
. **Schmidt number**  
RT Nusselt number  
Prandtl number

### Schmidt telescopes

GS telescopes  
. **Schmidt telescopes**  
RT reflecting telescopes

### schools

RT education  
instructors  
training evaluation

universities

### schools (fish)

GS animals  
. vertebrates  
.. fishes  
... **schools (fish)**  
RT fishing  
ichthyology

### Schottky barrier diodes

USE **Schottky diodes**

### Schottky diodes

UF **Schottky barrier diodes**  
GS electronic equipment  
. diodes  
.. semiconductor diodes  
... **Schottky diodes**  
. solid state devices  
.. semiconductor devices  
... **Schottky diodes**  
RT ∞ barriers  
Barritt diodes  
gallium arsenides  
MSM (semiconductors)  
n-type semiconductors  
semiconductor junctions  
silicon  
SIS (semiconductors)  
work functions  
zinc selenides

### Schottky effect

USE **work functions**

### schreibersite

GS iron compounds  
. **schreibersite**  
minerals  
. **schreibersite**  
nickel compounds  
. **schreibersite**  
phosphorus compounds  
. phosphides  
.. **schreibersite**  
RT iron meteorites  
meteoritic composition  
stony meteorites

### Schroedinger equation

GS wave equations  
. **Schroedinger equation**  
RT ∞ equations  
Wentzel-Kramer-Brillouin method

### Schuler tuning

DEF Adjusting a system performing the function of a pendulum so that it has a period of 84 minutes.

GS tuning  
. **Schuler tuning**  
RT gyroscopic pendulums  
gyroscopic stability  
inertial navigation

### Schumann-Runge bands

GS spectra  
. spectral bands  
.. **Schumann-Runge bands**  
RT absorption spectra  
∞ bands  
emission spectra  
Herzberg bands  
oxygen  
quantum theory

### Schwartz inequality

GS inequalities  
. **Schwartz inequality**  
RT algebra  
linear transformations  
vectors (mathematics)

### Schwartz method

GS analysis (mathematics)  
. numerical analysis  
.. approximation  
... **Schwartz method**  
stress analysis

- . **Schwartz method**
- RT ∞ methodology
- Schwarz-Christoffel transformation**
- GS analysis (mathematics)
  - . complex variables
  - . . **Schwarz-Christoffel transformation**
  - functions (mathematics)
  - . **Schwarz-Christoffel transformation**
- RT conformal mapping
- Schwarzschild antennas**
- GS antennas
  - . **Schwarzschild antennas**
- RT horns
  - parabolic reflectors
  - radar antennas
  - radio antennas
- Schwarzschild metric**
- RT bimetric theories
  - coordinate transformations
  - escape velocity
  - event horizon
  - gravitational fields
  - ionization
  - light speed
  - orbitals
  - orbits
  - relativity
- Schwassmann-Wachmann comet**
- GS celestial bodies
  - . comets
  - . . **Schwassmann-Wachmann comet**
- RT Comet Nucleus Tour
  - solar system
- sciatic region**
- GS anatomy
  - . **sciatic region**
  - regions
  - . **sciatic region**
- RT human body
  - lumbar region
  - musculoskeletal system
  - nerves
  - spine
- ∞ **science**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT acoustics
  - aeroacoustics
  - aerodynamics
  - ∞ aeronautics
  - aerospace medicine
  - aerothermodynamics
  - algebra
  - anthropology
  - astrodynamics
  - astronomy
  - astrophysics
  - atmospheric physics
  - atomic physics
  - bioacoustics
  - bioastronautics
  - biodynamics
  - ∞ biology
  - biophysics
  - botany
  - cloud physics
  - combustion physics
  - computational astrophysics
  - electrophysics
  - electrophysiology
  - entomology
  - fluid dynamics
  - fluid mechanics
  - geology
  - geometry
  - geophysics
  - health physics
  - heliogeology
  - hydrogeology
  - hydromechanics
  - life sciences
  - low temperature physics
  - marine biology
  - marine chemistry
  - marine meteorology
  - ∞ materials science
  - ∞ mathematics
  - medical science
  - ∞ metallurgy
  - meteorology
  - ∞ molecular physics
  - neurophysiology
  - neutron physics
  - nuclear physics
  - oceanography
  - ∞ optics
  - ∞ physical sciences
  - ∞ physics
  - physiochemistry
  - physiology
  - plasma physics
  - polymer physics
  - psychophysics
  - psychophysiology
  - radio astronomy
  - radio physics
  - reactor physics
  - reentry physics
  - respiratory physiology
  - seismology
  - solar diameter
  - solar physics
  - solid mechanics
  - ∞ solid state physics
  - stellar physics
  - sunrise
  - sunset
  - taxonomy
  - theoretical physics
  - trigonometry
  - underwater physiology
  - ∞ zoology
- scientific instrument modules*
- USE **SIM**
- scientific satellites**
- GS artificial satellites
  - . **scientific satellites**
  - . . AMPTE (satellites)
  - . . astronomical satellites
  - . . . Astronomical Netherlands Satellite
  - . . . Gamma Ray Observatory
  - . . . Ginga satellite
  - . . . HEAO
  - . . . . HEAO 1
  - . . . . HEAO 2
  - . . . . HEAO 3
  - . . . . HEAO 4
  - . . . Hubble Space Telescope
  - . . . Infrared Astronomy Satellite
  - . . . Infrared Space Observatory (ISO)
  - . . . IUE
  - . . . Large Deployable Reflector
  - . . . Magellan ultraviolet astronomy satellite
  - . . . OAO
  - . . . . OAO 1
  - . . . . OAO 2
  - . . . . OAO 3
  - . . . OSO
  - . . . . AOSO
  - . . . . OSO-1
  - . . . . OSO-2
  - . . . . OSO-3
  - . . . . OSO-4
  - . . . . OSO-5
  - . . . . OSO-6
  - . . . . OSO-7
  - . . . . OSO-8
  - . . . . OSO-C
  - . . . Quasat
  - . . . SAS
  - . . . . Explorer 53 satellite
  - . . . . SAS-1
  - . . . . SAS-2
  - . . . . SAS-3
  - . . . Constellation-X
  - . . . Fermi Gamma-ray Space Telescope
  - . . . James Webb Space Telescope
  - . . . Kepler mission
  - . . . LISA (observatory)
  - . . . Space Infrared Telescope Facility
  - . . . Spartan satellites
  - . . . Submillimeter Wave Astronomy Satellite
  - . . . Swift observatory
  - . . . Tenma satellite
  - . . . Wide-field Infrared Survey Explorer
  - . . . X Ray Astrophysics Facility
  - . . . XMM-Newton telescope
  - . . . ATS
  - . . . . ATS 1
  - . . . . ATS 2
  - . . . . ATS 3
  - . . . . ATS 4
  - . . . . ATS 5
  - . . . . ATS 6
  - . . . . ATS 7
  - . . . . ATS 8
  - . . . Azur satellite
  - . . . Cannonball 2 satellite
  - . . . CRRES (satellite)
  - . . . DIAL satellite
  - . . . Environmental Research Satellites
  - . . . ERS 17
  - . . . ERS 18
  - . . . Intasat satellite
  - . . . EXOS satellites
  - . . . . EXOS-A satellite
  - . . . . EXOS-B satellite
  - . . . . EXOS-C satellite
  - . . . . EXOS-D satellite
  - . . . Exosat satellite
  - . . . Explorer satellites
  - . . . Applications Explorer Satellites
  - . . . Cosmic Background Explorer satellite
  - . . . Dual Air Density Explorer
  - . . . Dynamics Explorer satellites
  - . . . . Dynamics Explorer 1 satellite
  - . . . . Dynamics Explorer 2 satellite
  - . . . Explorer 1 satellite
  - . . . Explorer 2 satellite
  - . . . Explorer 3 satellite
  - . . . Explorer 4 satellite
  - . . . Explorer 5 satellite
  - . . . Explorer 6 satellite
  - . . . Explorer 7 satellite
  - . . . Explorer 8 satellite
  - . . . Explorer 9 satellite
  - . . . Explorer 10 satellite
  - . . . Explorer 11 satellite
  - . . . Explorer 12 satellite
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  - . . . Explorer 43 satellite
  - . . . Explorer 44 satellite
  - . . . Explorer 45 satellite
  - . . . Explorer 46 satellite
  - . . . Explorer 47 satellite



## scientific visualization

- ... Explorer 48 satellite
- ... Explorer 49 satellite
- ... Explorer 50 satellite
- ... Explorer 51 satellite
- ... Explorer 52 satellite
- ... Explorer 53 satellite
- ... Explorer 54 satellite
- ... Explorer 55 satellite
- ... Extreme Ultraviolet Explorer satellite
- ... Far UV Spectroscopic Explorer
- ... IMP
- ... International Magnetospheric Explorer
- ... International Sun Earth Explorers
- ... International Sun Earth Explorer 1
- ... International Sun Earth Explorer 2
- ... International Sun Earth Explorer 3
- ... Advanced Composition Explorer
- ... IMAGE satellite
- ... Micrometeoroid Explorer satellites
- ... Radio Astronomy Explorer satellite
- ... Solar Mesosphere Explorer
- ... Submillimeter Wave Astronomy Satellite
- ... Transition Region and Coronal Explorer
- ... Uhuru satellite
- ... X Ray Timing Explorer
- ... Geopotential Research Mission
- ... Hawkeye satellites
- ... Long Duration Exposure Facility
- ... LZEEBE satellite
- ... MagSat satellites
- ... MagSat 1 satellite
- ... Magsat A satellite
- ... MagSat B satellite
- ... ORBIS
- ... ORBIS CAL satellite
- ... OV-1 satellites
- ... OV-2 satellites
- ... OV-3 satellites
- ... OV-4 satellites
- ... OV-5 satellites
- ... SCATHA satellite
- ... small scientific satellites
- ... Submillimeter Wave Astronomy Satellite
- ... Transition Region and Coronal Explorer
- ... UK satellites
- ... Ariel 4 satellite
- ... Ariel 5 satellite
- ... Miranda satellite
- ... UK 4 satellite
- ... Aqua spacecraft
- ... Aura spacecraft
- ... CALIPSO (Pathfinder satellite)
- ... CloudSat
- ... Glory Mission satellite
- ... Ice, Cloud and Land Elevation Satellite
- ... Orbiting Carbon Observatory (OCO)
- ... Polar/GGS spacecraft
- ... QuikSCAT satellite
- ... TRMM satellite
- ... Upper Atmosphere Research Satellite (UARS)
- ... Wind/GGS spacecraft
- RT Canadian space program
- Cluster Mission
- EOS data and information system
- ESRO 4 satellite
- SOHO Mission
- technology feasibility spacecraft

### scientific visualization

(added July 1993)

- UF *data visualization*
- GS information analysis
  - . **scientific visualization**
  - ... numerical flow visualization
- RT computer graphics
  - computerized simulation

- display devices
- image processing
- Mission to Planet Earth
- scene generation
- software development tools

### scientists

- GS manpower
  - . **scientists**
  - personnel
  - . **scientists**
- RT awards
  - engineers

### Scimitar aircraft

- UF *Vickers Scimitar aircraft*
- GS attack aircraft
  - . fighter aircraft
  - . . **Scimitar aircraft**
  - BAC aircraft
  - . **Scimitar aircraft**
  - jet aircraft
  - . **Scimitar aircraft**
  - monoplanes
  - . **Scimitar aircraft**
- RT ∞ aircraft

### scintillating fibers

(added December 1992)

- UF *scintillation fibers*
- GS fibers
  - . optical fibers
  - . . **scintillating fibers**
  - optical materials
  - . optical fibers
  - . . **scintillating fibers**
  - waveguides
  - . optical waveguides
  - . . optical fibers
  - . . . **scintillating fibers**
- RT calorimeters
  - cosmic rays
  - fiber optics
  - gamma ray spectrometers
  - gamma ray telescopes
  - gamma rays
  - hodoscopes
  - photomultiplier tubes
  - radiation counters
  - scintillation
  - scintillation counters

### scintillation

DEF Generic term for rapid variations in apparent position, brightness, or color of a distant luminous object viewed through the atmosphere. A flash of light produced in a phosphor by an ionizing event. On a radar display, a rapid apparent displacement of the target from its mean position.

- RT glint
  - phosphorescence
  - scintillating fibers
  - seeing (astronomy)

### scintillation counters

DEF The combinations of phosphor, photomultiplier tube, and associated circuits for counting scintillations. Used for scintillators and scintillometers.

- UF *scintillators*
- scintillometers*
- GS measuring instruments
  - . counters
  - . . radiation counters
  - . . . **scintillation counters**
  - . radiation measuring instruments
  - . . radiation counters
  - . . . **scintillation counters**
- RT anticoincidence detectors
  - Cerenkov counters
  - neutron counters
  - particle telescopes
  - photomultiplier tubes
  - photopeak

- scintillating fibers

*scintillation fibers*  
USE **scintillating fibers**

*scintillators*  
USE **scintillation counters**

*scintillometers*  
USE **scintillation counters**

*scission*  
USE **cleavage**

**scoops**  
RT air intakes
 

- conveyors
- ducts
- intake systems
- nose inlets
- side inlets
- ∞ water intakes

*scopolamine*  
USE **hyoscine**

*SCORE omnirange*  
USE **self calibrating omnirange**

**SCORE satellite**  
GS artificial satellites
 

- . **SCORE satellite**

**scoring**  
UF *scribing*  
RT abrasion
 

- defects
- friction
- pitting
- wear

*Scorpio constellation*  
USE **Scorpius constellation**

**Scorpius constellation**  
UF *Scorpio constellation*  
GS constellations
 

- . **Scorpius constellation**

RT zodiac

**Scotchlite (trademark)**  
RT membrane structures
 

- refractory materials

**Scotland**  
GS nations
 

- . United Kingdom
- . . **Scotland**

RT Europe

*Scout helicopter*  
USE **P-531 helicopter**

**Scout launch vehicle**  
GS launch vehicles
 

- . **Scout launch vehicle**
- rocket vehicles
- . multistage rocket vehicles
- . . **Scout launch vehicle**

RT Algol engine
 

- Explorer 9 satellite
- Explorer 16 satellite
- Explorer 19 satellite
- Explorer 20 satellite
- Explorer 22 satellite
- Explorer 23 satellite
- Explorer 24 satellite
- Explorer 25 satellite
- Explorer 27 satellite
- Explorer 30 satellite
- Explorer 37 satellite
- Explorer 39 satellite
- Explorer 40 satellite
- San Marco satellites
- solid propellant rocket engines
- TX-354 engine
- X-248 engine
- X-254 engine
- X-258 engines
- X-259 engine

XM-33 engine

**Scout project**

- GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . **Scout project**
  - . projects
  - . . **Scout project**
  - . space programs
  - . . NASA space programs
  - . . . **Scout project**
- RT ∞ boosters
  - Explorer satellites
  - launch vehicles

*SCPC transmission*

USE **single channel per carrier transmission**

*SCR (rectifiers)*

USE **silicon controlled rectifiers**

∞ **SCRAM**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT missiles
  - shutdowns
  - supersonic combustion ramjet engines

**scrambling (communication)**

- RT intelligibility
  - security
  - signal distortion
  - signal encoding
  - vocoders
  - voice communication

*scramjet engines*

USE **supersonic combustion ramjet engines**

*scramjets*

USE **supersonic combustion ramjet engines**

**scrap**

- RT chips
  - debris
  - metal particles
  - wastes

**scrapers**

- RT cutters
  - files (tools)
  - honing
- ∞ separation

**screech tones**

(added March 1998)

DEF Discrete acoustic tones produced by imperfectly expanded supersonic jets. The phenomenon is a result of a resonant feedback condition involving downstream traveling shear-layer disturbances and upstream traveling acoustic waves.

- GS elastic waves
  - . sound waves
  - . . noise (sound)
  - . . . flow noise
  - . . . . aerodynamic noise
  - . . . . . **screech tones**
  - frequencies
    - . acoustic frequencies
    - . . **screech tones**
- RT aeroacoustics
  - feedback
  - jet aircraft noise
  - jet mixing flow
  - nozzle flow
  - shear layers
  - supersonic jet flow
  - supersonic nozzles

**screen effect**

- RT ∞ coma
  - dielectrics
  - Earth magnetosphere
- ∞ effects

- electromagnetic wave filters
- electromagnetic wave transmission
- electron gas
- semiconductors (materials)
- wave propagation

∞ **screening**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT filtration
  - finer
  - louvers
  - selection
  - water treatment

∞ **screens**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT curtains
  - display devices
  - protectors
  - shielding
  - sizing screens
  - wire cloth

**screw dislocations**

- GS defects
  - . crystal defects
  - . . crystal dislocations
  - . . . **screw dislocations**
  - dislocations (materials)
  - . crystal dislocations
  - . . **screw dislocations**
- RT edge dislocations

**screw pinch**

DEF A cylindrical plasma equilibrium in which the axial and azimuthal components of the vacuum field are of the same size.

- GS pinch effect
  - . plasma pinch
  - . . **screw pinch**
- RT magnetic fields
  - magnetohydrodynamic flow
  - plasma control
  - reverse field pinch
  - theta pinch
  - zeta pinch

**screws**

- SN (EXCLUDES PROPELLERS AND CRYSTAL DEFECTS)
- GS fasteners
  - . **screws**
- RT anchors (fasteners)
  - bolts
  - couplings
  - holders
  - nuts (fasteners)
  - studs (structural members)
  - threads

*scribing*

USE **scoring**

**scrubbers**

DEF Apparatus used in sampling and in gas cleaning in which the gas is passed through a space containing wetted "packing" or spray.

- RT cleaning
  - columns (process engineering)
  - flue gases
  - washing

*scrubbing*

USE **washing**

*scrubs (botany)*

USE **brush (botany)**

**Scutum constellation**

- GS constellations
  - . **Scutum constellation**
- RT zodiac

**Scylla**

- GS plasma generators
  - . **Scylla**
- RT magnetic fields
  - magnetic mirrors

- magnetic variations
- plasmas (physics)
- thermonuclear reactions

*SDP (computers)*

USE **site data processors**

**SDS 900 series computers**

- GS data processing equipment
  - . computers
  - . . digital computers
  - . . . **SDS 900 series computers**
  - . . . . SDS 930 computer

**SDS 930 computer**

- GS data processing equipment
  - . computers
  - . . digital computers
  - . . . SDS 900 series computers
  - . . . . **SDS 930 computer**

**SDS 9300 computer**

- GS data processing equipment
  - . computers
  - . . digital computers
  - . . . **SDS 9300 computer**

*SDV*

USE **Shuttle Derived Vehicles**

**SE-210 aircraft**

- UF *Caravelle aircraft*
  - Sud Aviation SE-210 aircraft*
- GS commercial aircraft
  - . **SE-210 aircraft**
  - jet aircraft
    - . turbofan aircraft
    - . . **SE-210 aircraft**
  - monoplanes
    - . **SE-210 aircraft**
  - passenger aircraft
    - . **SE-210 aircraft**
  - Sud Aviation aircraft
    - . **SE-210 aircraft**
- RT ∞ aircraft

**SE-3160 helicopter**

- UF *Alouette 3 helicopter*
  - Sud Aviation SE-3160 helicopter*
- GS Sud Aviation aircraft
  - . Alouette helicopters
  - . . **SE-3160 helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . Alouette helicopters
    - . . . . **SE-3160 helicopter**

*SE-A*

USE **Explorer 30 satellite**

**sea breeze**

DEF A coastal, local wind that blows from sea to land caused by temperature differences when the sea surface is colder than the adjacent land.

- GS wind (meteorology)
  - . **sea breeze**
- RT aerology
  - air currents
  - atmospheric circulation
  - barotropic flow
  - climatology
  - geostrophic wind
  - gusts
  - marine environments
  - meteorology
  - monsoons
  - offshore energy sources
  - tidal waves
  - wind direction
  - wind effects
  - wind erosion
  - wind measurement
  - windpower utilization
  - winds aloft

**sea floor spreading**

(added July 1992)

DEF A hypothesis that the oceanic crust is

## sea grasses

increasing by convective upwelling of magma along the mid-ocean ridges or world rift system, and by a moving-away of the new material at a rate of one to ten centimeters per year. This movement provides the source of dynamic thrust in the hypothesis of plate tectonics.

UF *ocean floor spreading*

RT Earth crust  
Earth mantle  
Earth movements  
mid-ocean ridges  
neotectonics  
ocean bottom  
plates (tectonics)  
submarine hydrothermal vents  
tectonics  
terradyamics

## sea grasses

GS plants (botany)

. grasses

. . **sea grasses**

RT marine biology  
oceanography  
seaweeds  
vegetation  
wetlands

## sea ice

UF *ice packs*

GS ice

. **sea ice**

. . ice floes

. . icebergs

. . pressure ice

RT air sea ice interactions  
bay ice  
freezing  
glacial drift  
glaciers  
ice environments  
ice formation  
ice mapping  
lake ice  
land ice  
nunataks  
oceanography  
polynyas

## sea keeping

DEF Maintaining the stability of a surface vessel in linear response to wave height, pitch, heave, center of gravity, and bow acceleration.

RT attitude gyros  
damping  
gyroscopic stability  
gyrostabilizers  
motion stability  
∞ stabilizers  
torquers

*Sea King helicopter*

USE **SH-3 helicopter**

*Sea Knight helicopter*

USE **CH-46 helicopter**

## sea launching

GS launching

. **sea launching**

RT antiship missiles  
antiship warfare  
ballistic missile submarines  
catapults  
drydocks  
fleet ballistic missiles  
missile launchers  
Poseidon missiles  
rocket launchers  
torpedoes  
water takeoff and landing aircraft  
Zenit launch vehicles

## sea law

DEF United Nations declaration regarding rights to minerals and other marine resources.

GS law (jurisprudence)

. international law

. . **sea law**

RT ∞ cooperation

international cooperation

rules

United Nations

## sea level

DEF The level of the surface of the ocean; especially, the mean level halfway between high and low tide used as a standard in reckoning land elevation or sea depths.

GS altitude

. **sea level**

RT ocean surface

oceanography

sea states

## Sea of Japan

GS seas

. **Sea of Japan**

RT Asia

## Sea of Okhotsk

GS seas

. **Sea of Okhotsk**

RT Pacific Ocean

U.S.S.R.

## sea roughness

GS roughness

. **sea roughness**

RT hydrodynamic coefficients

ocean models

ocean surface

oceanography

surface waves

tidal waves

tide powered generators

tide powered machines

tidewater

tides

turbulence

water currents

water waves

waterwave energy conversion

waterwave powered machines

wind effects

wind velocity

## sea states

RT ocean models

ocean surface

ocean temperature

oceanographic parameters

oceanography

sea level

TOPEX

water currents

water waves

wind effects

## sea surface temperature

GS oceanographic parameters

. ocean temperature

. . **sea surface temperature**

surface properties

. surface temperature

. . **sea surface temperature**

temperature

. surface temperature

. . **sea surface temperature**

. water temperature

. . ocean temperature

. . . **sea surface temperature**

RT air water interactions

land surface temperature

ocean surface

oceanography

## sea truth

RT aerial photography

coastal currents

imagery

ocean surface

ocean temperature

photointerpretation

## sea urchins

GS animals

. invertebrates

. . **sea urchins**

*sea walls*

USE **breakwaters**

## sea water

GS water

. **sea water**

RT brines  
coastal water  
dissolved organic matter  
fisheries  
marine resources  
nearshore water  
ocean surface  
ocean temperature  
oceanography  
red tide  
salinity  
seaweeds  
thermoclines  
thermohaline circulation  
underwater photography  
underwater resources  
water resources  
water sampling

## seaborgium

(added May 1998)

GS chemical elements

. **seaborgium**

RT bohrium

dubnium

## Seafarer project

UF *Global Communications Antenna Grid*

(navy)

*underground radio antenna grid*

(navy)

GS programs

. projects

. . **Seafarer project**

RT extremely low frequencies

radio transmission

submarines

telecommunication

underwater communication

*seafloor hydrothermal vents*

(added April 2005)

USE **submarine hydrothermal vents**

*Seahorse helicopter*

USE **UH-34 helicopter**

*sealants*

USE **sealers**

## sealers

UF *sealants*

RT adhesives

coatings

dopes

fillers

packaging

packings (seals)

paints

sealing

seals (stoppers)

seams (joints)

solders

varnishes

## sealing

GS **sealing**

. self sealing

RT adhesion

adhesive bonding

binding

blocking

blowers

bonding

brazing

caulking

cements

clamps

closing

coating

coatings

containment

- coverings
- encapsulating glands (seals)
- ∞ joining
- lining processes
- moisture resistance
- ∞ packing
- packings (seals)
- plugging
- retaining
- riveting
- sealers
- soldering
- spraying
- stopping
- waterproofing
- welding
- seals (animals)**
- GS animals
  - . vertebrates
  - . . mammals
  - . . . marine mammals
  - . . . . **seals (animals)**
- RT marine biology
- seals (stoppers)**
- GS **seals (stoppers)**
  - . brush seals
  - . gaskets
  - . glands (seals)
  - . hermetic seals
  - . labyrinth seals
  - . O ring seals
  - . packings (seals)
  - . plugs
  - . pump seals
- RT air locks
- barrier layers
- ∞ barriers
- blocking
- ∞ caps
- closures
- constrictions
- cuffs
- plugging
- sealers
- spherical caps
- ∞ tapes
- valves
- seamounts**
- DEF Elevations of the ocean floor rising to about 3000-1000 feet or more with the summit about 1000-6000 feet below sea level.
- RT continental shelves
- crevasses
- ∞ faults
- folds (geology)
- islands
- landforms
- mid-ocean ridges
- ocean bottom
- structural basins
- seams (joints)**
- GS joints (junctions)
  - . **seams (joints)**
- RT adhesives
- fillets
- metal joints
- sealers
- seaplanes**
- GS water takeoff and landing aircraft
  - . **seaplanes**
- RT amphibious aircraft
- amphibious vehicles
- hulls (structures)
- monoplanes
- Search and Rescue Satellite*
- USE **SarSat**
- Search for Extraterrestrial Intelligence*
- USE **Project SETI**
- search profiles**
- GS searching
  - . **search profiles**
- RT data retrieval
- information retrieval
- ∞ profiles
- search radar**
- GS radar
  - . **search radar**
  - . . over-the-horizon radar
- RT airport surface detection equipment
- coherent radar
- continuous wave radar
- pulse radar
- radar detection
- radar tracking
- satellite-borne radar
- side-looking radar
- surveillance radar
- tracking radar
- TRADEX radar system
- searching**
- GS **searching**
  - . search profiles
- RT conical scanning
- COSPAS
- panoramic scanning
- reconnaissance
- retrieval
- SarSat
- scanning
- selection
- searchlights**
- GS lighting equipment
  - . luminaires
  - . . **searchlights**
- RT airport lights
- arc lamps
- beacons
- projectors
- runway lights
- seas**
- DEF Inland bodies of salt water or geographic divisions of oceans or ocean areas of wave generation.
- GS **seas**
  - . Arabian Sea
  - . Baltic sea
  - . Barents Sea
  - . Beaufort Sea (North America)
  - . Bering Sea
  - . Black Sea
  - . Caribbean Sea
  - . Caspian Sea
  - . Chukchi Sea
  - . Mediterranean Sea
  - . . Adriatic Sea
  - . North Sea
  - . Red Sea
  - . Salton Sea (CA)
  - . Sea of Japan
  - . Sea of Okhotsk
- RT archipelagoes
- coastal currents
- coasts
- deep water
- Earth hydrosphere
- ocean temperature
- oceanography
- oceans
- Sargasso Sea
- seaweeds
- shallow water
- shoals
- straits
- thermal pollution
- underwater photography
- SEASAT 1**
- GS artificial satellites
  - . SEASAT satellites
  - . . **SEASAT 1**
- RT Landsat satellites
- oceanography
- programs
- SEASAT-B satellite
- SEASAT program**
- GS programs
  - . NASA programs
  - . . NASA space programs
  - . . . Earth Resources Program
  - . . . . Earth Resources Survey Program
  - . . . . . **SEASAT program**
  - . space programs
  - . . NASA space programs
  - . . . Earth Resources Program
  - . . . . Earth Resources Survey Program
  - . . . . . **SEASAT program**
- RT Landsat satellites
- oceanography
- SEASAT satellites**
- GS artificial satellites
  - . **SEASAT satellites**
  - . . SEASAT 1
  - . . SEASAT-B satellite
- RT Landsat satellites
- NASA programs
- oceanography
- programs
- satellite altimetry
- Synchronous Earth Observatory
- satellite
- SEASAT-B satellite**
- GS artificial satellites
  - . SEASAT satellites
  - . . **SEASAT-B satellite**
- RT Landsat satellites
- oceanography
- programs
- SEASAT 1
- seasonal variations*
- USE **annual variations**
- seasons**
- GS **seasons**
  - . autumn
  - . spring (season)
  - . summer
  - . winter
- RT annual variations
- climatology
- crop calendars
- equinoxes
- meteorology
- solar position
- solstices
- weather
- wind variations
- Seasprite helicopter*
- USE **UH-2 helicopter**
- seat belts**
- DEF Safety belts that fasten across the lap.
- GS safety devices
  - . **seat belts**
- RT ∞ belts
- harnesses
- seats
- seats**
- UF *benches*
- chairs*
- GS **seats**
  - . Barany chair
  - . ejection seats
  - . . flying ejection seats
- RT comfort
- couches
- cushions
- harnesses
- ∞ lounges
- riding quality
- seat belts
- sitting position
- Sea-viewing Wide Field-of-view Sensor**
- (added December 1998)
- UF *SeaWiFS*
- GS scanners
  - . ocean color scanner
  - . . **Sea-viewing Wide Field-of-view Sensor**

## seaweeds

RT chlorophylls  
Coastal Zone Color Scanner  
ocean surface  
phytoplankton  
remote sensors  
satellite-borne instruments  
water color

### seaweeds

UF *kelp*  
RT marine biology  
oceanography  
oceans  
sea grasses  
sea water  
seas

### SeaWiFS

(added December 1998)

USE **Sea-viewing Wide Field-of-view  
Sensor**

### sebaceous glands

GS anatomy  
. glands (anatomy)  
.. **sebaceous glands**

### sebamic acid

GS acids  
. carboxylic acids  
.. fatty acids  
... **sebamic acid**  
organic compounds  
. carboxylic acids  
.. fatty acids  
... **sebamic acid**

### secondary batteries

USE **storage batteries**

### secondary cosmic rays

DEF Secondary emission in the atmosphere stimulated by primary cosmic rays. Used for Moliere formula.

UF *Moliere formula*  
GS ionizing radiation  
. cosmic rays  
.. **secondary cosmic rays**  
RT atmospheric radiation  
cosmic ray albedo  
cosmic ray showers  
electron decay rate  
electron photon cascades  
electron precipitation  
primary cosmic rays  
single event upsets

### secondary emission

DEF Emission of subatomic particles of photons stimulated by primary radiation; for example, cosmic rays impinging on other particles and causing them, by disruption of their electron configurations or even of their nuclei, to emit particles or photons or both in turn.

GS emission  
. particle emission  
.. electron emission  
... **secondary emission**  
RT dynodes  
electron irradiation  
field emission  
monoscopes  
multipactor discharges  
photomultiplier tubes  
scanning electron microscopy  
Townsend avalanche

### secondary flow

GS fluid flow  
. parallel flow  
.. three dimensional flow  
... **secondary flow**  
. viscous flow  
.. boundary layer flow  
... **secondary flow**  
translational motion  
. three dimensional motion  
.. three dimensional flow  
... **secondary flow**  
RT compressibility effects

corner flow  
three dimensional boundary layer  
vortices  
vorticity

### secondary injection

GS injection  
. **secondary injection**  
RT fluid injection  
shock wave control  
shock wave propagation  
supersonic flow  
thrust augmentation  
thrust vector control

### secondary ion mass spectrometry

(added July 1991)  
DEF Mass spectrometry performed on ions sputtered from a sample by a primary ion beam.

UF *SIMS (spectrometry)*  
GS spectroscopy  
. mass spectroscopy  
.. **secondary ion mass spectrometry**  
RT mass spectrometers

### secondary radar

DEF A radar technique or mode of operation in which the return signals are obtained from beacons, transponders, or repeaters carried by the targets, contrasted with primary radar in which the return signals are obtained by reflection from the targets.

GS radar  
. **secondary radar**  
RT discrete address beacon system  
interrogation

### secondary waves

USE **S waves**

### secretions

GS **secretions**  
. endocrine secretions  
.. hormones  
... corticosteroids  
.... aldosterone  
.... hydroxycorticosteroid  
..... cortisone  
.... glucocorticoids  
... estrogens  
... hypertensin  
... pituitary hormones  
... adrenocorticotropin (ACTH)  
... vasopressins  
... prostaglandins  
... thyroxine  
.. insulin  
. sweat  
RT body fluids  
gall  
glands (anatomy)  
hydrogen metabolism  
melatonin  
metabolism  
mineral metabolism  
skin (anatomy)

### ∞ sections

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT categories  
classes  
subdivisions  
subsidiaries

### ∞ sectors

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT area  
circles (geometry)  
regions

### secular perturbation

USE **long term effects**

### secular variations

GS variations  
. periodic variations  
.. **secular variations**

RT atmospheric physics  
solar activity effects  
solar cycles  
teleconnections (meteorology)

### security

GS **security**  
. airport security  
. computer security  
.. computer information security  
.. firewalls (computers)  
.. intrusion detection (computers)  
RT ∞ classifying  
computer program integrity  
crime  
integrity  
police  
privacy  
scrambling (communication)  
selective dissemination of information  
steganography  
terrorism  
vulnerability

### sedatives

GS drugs  
. **sedatives**  
RT pentobarbital  
phenobarbital  
psychotropic drugs  
tranquilizers

### sediment transport

RT mass flow  
mass transfer  
sediments

### sedimentary rocks

DEF Rocks resulting from the consolidation of loose sediments that have accumulated in layers, e.g., clastic rocks (such as fragments of older rocks transported from their source and deposited in water or from air or ice. Sedimentary rocks constitute one of the three main classes into which rocks are divided, the others being igneous rocks and metamorphic rocks.

GS rocks  
. **sedimentary rocks**  
.. carbonaceous rocks  
... coal  
... anthracite  
... lignite  
... solvent refined coal  
.. limestone  
.. sandstones  
.. shales

RT alluvium  
breccia  
clays  
dolomite (mineral)  
gypsum  
igneous rocks  
∞ layers  
monazite sands  
petrography  
sands  
sediments  
shatter cones  
soils  
stratigraphy

### sediments

DEF Solid fragmental materials that originate from weathering of rocks and are transported or deposited by air, water, or ice, or that accumulate by other natural agents, such as chemical precipitation from solution or secretion by organisms, and that form in layers on the Earth's surface at ordinary temperatures in a loose, unconsolidated form; e.g., sand, gravel, silt, mud, till, loess, and alluvium.

UF *silts*  
GS **sediments**  
. gravels  
. mud  
. sands  
.. monazite sands  
.. tar sands  
RT alluvium  
clays

deposition  
deposits  
dissolved organic matter  
dredged materials  
fans (landforms)  
glacial drift  
grit  
littoral drift  
marine chemistry  
ocean bottom  
peat  
sediment transport  
sedimentary rocks  
sewage treatment  
sludge  
soil pollution

SEE (software engineering environments)  
USE **programming environments**

Seebeck coefficient  
USE **Seebeck effect**

**Seebeck effect**

DEF The establishment of an electric potential difference tending to produce a flow of current in a circuit of two dissimilar metals the junctions of which are at different temperatures. Used for Seebeck coefficient.  
UF *Seebeck coefficient*  
RT ∞ effects  
Peltier effects  
temperature effects  
thermocouples  
thermodynamic properties  
thermoelectricity  
thermophysical properties  
transport properties

seeding (inoculation)  
USE **inoculation**

**seedlings (botany)**  
(added August 2004)  
DEF A very young plant after germination of seeds.  
GS plants (botany)  
. **seedlings (botany)**  
RT plant physiology  
plant roots  
seeds

**seeds**  
RT alfalfa  
barley  
citrus trees  
corn  
embryos  
farm crops  
grains (food)  
nuts (fruits)  
oats  
planting  
plants (botany)  
seedlings (botany)  
sugar beets  
sugar cane  
tomatoes  
utricle  
vegetables  
viability

**seeing (astronomy)**  
(added July 1989)  
UF *atmospheric seeing*  
RT astronomical observatories  
astronomy  
atmospheric effects  
atmospheric optics  
atmospheric turbulence  
optical correction procedure  
scintillation  
space observations (from Earth)  
telescopes

turbulence effects

*seekers*  
USE **homing devices**

**seepage**  
RT canals  
drainage  
flood damage  
flow nets  
hydrodynamics  
intrusion  
irrigation  
leakage  
losses  
offshore energy sources  
penetration  
percolation  
permeability  
piezometers  
water consumption

**segmented mirrors**  
(added August 1995)  
DEF Telescope mirrors made up of many small, thin, glass segments. Motorized controllers keep the segments optically aligned to form a single large mirror.  
GS mirrors  
. **segmented mirrors**  
RT adaptive optics  
astronomical observatories  
deformable mirrors  
honeycomb mirrors  
optical correction procedure  
reflecting telescopes

**segments**  
RT circles (geometry)  
∞ components  
curves (geometry)  
lines (geometry)  
radii

**Segre characteristic**  
RT ∞ characteristics  
crack propagation  
metal fatigue

*segregation*  
USE **separation**

**seismic energy**  
RT earthquake damage  
∞ energy  
strain energy methods

**seismic waves**  
DEF The disturbance of earth tremors produced by a mechanical disturbance on the surface or underground. Used for electroseismic effect.  
UF *electroseismic effect*  
GS elastic waves  
. **seismic waves**  
. . Love waves  
. . microseisms  
. . Rayleigh waves  
RT crustal fractures  
detonation waves  
dilatational waves  
Earth movements  
earthquake damage  
earthquake resistance  
earthquake resistant structures  
earthquakes  
Gutenberg zone  
large aperture seismic array  
longitudinal waves  
P waves  
planetary quakes  
polarized elastic waves  
S waves  
seismology  
SH waves  
shock waves  
surface waves  
tsunami waves  
underground explosions

∞ waves

**seismocardiography**  
DEF The measurement of the high frequency vibrations of the heart.  
GS bioengineering  
. biometrics  
. . cardiography  
. . . **seismocardiography**  
RT ballistocardiography  
fibrillation

**seismograms**  
RT seismographs

**seismographs**  
UF *seismometers*  
GS measuring instruments  
. vibration meters  
. . **seismographs**  
. . . lunar seismographs  
recording instruments  
. **seismographs**  
. . lunar seismographs  
RT accelerometers  
acoustic measurement  
phased arrays  
seismograms  
shock measuring instruments  
tiltmeters

**seismology**  
DEF The study of earthquakes, by extension, the structure of the interior of the Earth via both natural and artificially generated seismic signals.  
GS **seismology**  
. asteroseismology  
. moonquakes  
. . helioseismology  
RT asthenosphere  
crustal fractures  
Earth movements  
Earth sciences  
earthquake damage  
earthquakes  
geology  
geophysics  
isostasy  
large aperture seismic array  
lunar geology  
mid-ocean ridges  
Rouse belts  
∞ science  
seismic waves  
subduction (geology)  
tidal waves

*seismometers*  
USE **seismographs**

**seizures**  
RT convulsions  
cramps

**SEL computers**  
GS data processing equipment  
. computers  
. . digital computers  
. . . **SEL computers**

**selection**  
UF *choice*  
GS **selection**  
. personnel selection  
. . pilot selection  
. materials selection  
. site selection  
RT certification  
∞ classifying  
collection  
decisions  
evaluation  
figure of merit  
options  
ranking  
rejection  
sampling  
∞ screening  
searching

## selection rules (nuclear physics)

sorting algorithms  
∞ tests

### selection rules (nuclear physics)

GS rules  
. **selection rules (nuclear physics)**  
RT alpha decay  
emission  
forbidden transitions  
neutron emission  
∞ physics  
quantum numbers

### selective dissemination of information

GS communicating  
. information dissemination  
. . **selective dissemination of information**  
RT computer information security  
data storage  
documentation  
indexes (documentation)  
information flow  
information retrieval  
information systems  
libraries  
management planning  
security  
technology transfer

### selective fading

GS fading  
. signal fading  
. . **selective fading**  
RT frequency analyzers  
ground wave propagation  
modulation  
sidebands  
signal fading rate

### selective surfaces

DEF Surfaces, often coated, for which the spectral optical properties, such as reflectance, absorptance, emittance, or transmittance vary significantly with wavelength. Such properties are of interest in solar energy applications. Used for solar selective coatings.

UF *solar selective coatings*  
RT energy absorption films  
selectivity  
solar collectors  
solar energy absorbers  
thermochromic coatings

### selectivity

RT discrimination  
photothermal conversion  
selective surfaces

### selectors

RT analyzers  
circuits  
electric relays  
samplers  
switches  
switching circuits

### selenides

GS chalcogenides  
. **selenides**  
. . cadmium selenides  
. . copper selenides  
. . . copper indium selenides  
. . gallium selenides  
. . indium selenides  
. . . copper indium selenides  
. . lead selenides  
. . zinc selenides  
selenium compounds  
. **selenides**  
. . cadmium selenides  
. . copper selenides  
. . . copper indium selenides  
. . gallium selenides  
. . indium selenides  
. . . copper indium selenides  
. . lead selenides

. . zinc selenides

### selenium

GS chemical elements  
. **selenium**  
RT selenium isotopes

### selenium alloys

GS alloys  
. **selenium alloys**  
RT copper

### selenium compounds

GS **selenium compounds**  
. selenides  
. . cadmium selenides  
. . copper selenides  
. . . copper indium selenides  
. . gallium selenides  
. . indium selenides  
. . . copper indium selenides  
. . lead selenides  
. . zinc selenides  
. selenium oxides  
RT ∞ chemical compounds  
∞ Group 6A compounds

### selenium isotopes

GS chemical elements  
. nuclides  
. . isotopes  
. . . **selenium isotopes**  
RT selenium

### selenium oxides

GS chalcogenides  
. oxides  
. . **selenium oxides**  
selenium compounds  
. **selenium oxides**

### selenography

RT geography  
lunar craters  
lunar crust  
lunar landing sites  
lunar maps  
lunar mobile laboratories  
lunar rays  
lunar rocks  
lunar topography  
moon  
selenology  
surface properties

### selenology

DEF That branch of astronomy that treats of the moon, its magnitude, motion, constitution, and the like. Selene is Greek for moon.

RT astronomy  
lunar composition  
lunar core  
lunar craters  
lunar crust  
lunar dust  
lunar echoes  
lunar eclipses  
lunar effects  
lunar environment  
lunar equator  
lunar evolution  
lunar exploration  
lunar far side  
lunar figure  
lunar geology  
lunar gravitation  
lunar gravitational effects  
lunar limb  
lunar luminescence  
lunar magnetic fields  
lunar mantle  
lunar maria  
lunar occultation  
lunar phases  
lunar radar echoes  
lunar radiation  
lunar rocks  
lunar rotation  
lunar seismographs  
lunar shadow

lunar soil  
lunar surface  
lunar temperature  
lunar tides  
lunar topography  
moon  
moonquakes  
regolith  
selenography

### self absorption

GS energy absorption  
. radiation absorption  
. . **self absorption**  
RT ∞ absorption  
absorption spectra  
absorptivity  
automatic control  
diffusion  
∞ radiation

### self adaptive control systems

DEF Particular types of stability augmentation systems which change the responses of given control inputs by constantly sampling responses and adjusting their gain, rather than having fixed or selective gain systems.

GS automatic control  
. adaptive control  
. . **self adaptive control systems**  
RT active control  
adaptive optics  
automata theory  
autonomy  
∞ control  
∞ systems

### self alignment

GS alignment  
. **self alignment**  
RT active control  
adaptive control  
automatic control  
landing gear  
model reference adaptive control  
servomechanisms

### self assembly

(added January 2001)

DEF Coordinated action of independent units to produce a larger structure or to achieve a desired group effect. A strategy for nanofabrication that involves designing molecules and supramolecular entities so that shape-complementarity or other properties causes them to aggregate into desired structures.

GS assembling  
. **self assembly**  
RT abiogenesis  
∞ assembly  
chemical evolution  
fabrication  
micelles  
molecular biology  
molecular structure  
monomolecular films  
nanofabrication  
nanostructure (characteristics)  
nanotechnology  
synthesis (chemistry)

### self calibrating omnirange

UF *SCORE omnirange*  
GS navigation aids  
. beacons  
. . radio beacons  
. . . omnidirectional radio ranges  
. . . . **self calibrating omnirange**  
radio equipment  
. radio transmitters  
. . radio beacons  
. . . omnidirectional radio ranges  
. . . . **self calibrating omnirange**  
transmitters  
. radio transmitters  
. . radio beacons  
. . . omnidirectional radio ranges  
. . . . **self calibrating omnirange**

RT solar compasses

**self consistent fields**  
 UF *SCF*  
 RT computational chemistry  
 field theory (physics)  
 ∞ fields  
 Hartree approximation  
 magnetic fields  
 molecular orbitals  
 quantum electrodynamics  
 shell theory

*self deploying space stations*  
 USE **self erecting devices**  
**space stations**

**self diffusion (solid state)**  
 DEF The spontaneous movement of an atom to a new site in a crystal of its own species.  
 GS diffusion  
 . **self diffusion (solid state)**  
 RT atomic mobilities  
 ionic diffusion  
 molecular diffusion  
 particle diffusion

**self erecting devices**  
 UF *self deploying space stations*  
 RT ∞ automation  
 ∞ devices  
 ∞ equipment  
 inflatable spacecraft  
 inflatable structures  
 orbital assembly  
 space erectable structures

**self excitation**  
 GS excitation  
 . **self excitation**  
 RT forced vibration  
 free vibration  
 oscillators  
 resonators

**self focusing**  
 GS focusing  
 . **self focusing**  
 RT image contrast  
 ∞ machinery  
 optical correction procedure  
 optical measuring instruments

*self ignition*  
 (added April 1997)  
 USE **spontaneous combustion**

**self induced vibration**  
 GS vibration  
 . structural vibration  
 . . **self induced vibration**  
 . . . panel flutter  
 . . . subsonic flutter  
 . . . supersonic flutter  
 . . . transonic flutter  
 RT bending vibration  
 flutter  
 forced vibration  
 free vibration  
 missile vibration  
 pilot induced oscillation  
 random vibration  
 torsional vibration

*self initiated anti-aircraft missiles*  
 USE **SIAM missiles**

**self lubricating materials**  
 RT impregnating  
 lubrication  
 ∞ materials  
 solid lubricants  
 spacecraft lubrication

**self lubrication**  
 GS lubrication  
 . **self lubrication**  
 RT impregnating

**self maneuvering units**  
 UF *personnel propulsion systems*

*reaction jet backpacks*  
*SMU (maneuvering units)*  
*space self maneuvering units*  
 GS **self maneuvering units**  
 . IMLSS  
 RT astronaut maneuvering equipment  
 extravehicular activity  
 extravehicular mobility units  
 maneuvers  
 manned maneuvering units

**self organizing systems**  
 UF *perceptrons*  
 RT artificial intelligence  
 machine learning  
 ∞ systems  
 Turing machines

**self oscillation**  
 GS oscillations  
 . **self oscillation**  
 RT feedback amplifiers  
 positive feedback  
 transfer functions

**self propagation**  
 GS diffusion  
 . **self propagation**  
 transmission  
 . **self propagation**  
 RT ∞ propagation

*self regulating*  
 USE **automatic control**

**self repairing devices**  
 RT ∞ automation  
 ∞ devices  
 evolvable hardware  
 maintenance

**self sealing**  
 GS sealing  
 . **self sealing**  
 RT flight safety  
 fuel systems  
 rupturing  
 support systems

**self shadowing**  
 RT large space structures  
 shadows  
 solar arrays

**self stimulation**  
 RT motivation  
 reinforcement (psychology)

*self subtraction holography*  
 USE **holographic subtraction**

**self sustained emission**  
 GS emission  
 . **self sustained emission**  
 RT electron emission  
 light emission  
 particle emission  
 stimulated emission

**self tests**  
 DEF Programmed functions performed by a machine, either automatically at start-up or on user demand, that test the working order of the machine. In particular, programs stored in read-only memory that test the integrity of a machine's integrated circuits and the connections between the circuits and the devices they control.  
 RT automatic test equipment  
 avionics  
 checkout  
 electronic equipment tests  
 fail-safe systems

∞ tests  
*Selsyns (trademark)*  
 USE **servomotors**

*SEM (microscopy)*  
 USE **scanning electron microscopy**

**semantics**  
 GS linguistics  
 . **semantics**  
 RT communication theory  
 grammars  
 languages  
 message processing  
 messages  
 natural language processing  
 nomenclatures  
 orthography  
 parsing algorithms  
 predicate logic  
 psycholinguistics  
 sentences  
 speech  
 syllables  
 symbols  
 syntax  
 words (language)

**semicircular canals**  
 DEF Structures of the inner ear, the primary function of which is to register movement of the body in space. They respond to change in the rate of movement.  
 GS anatomy  
 . sense organs  
 . . ear  
 . . . labyrinth  
 . . . . **semicircular canals**  
 RT eardrums  
 middle ear  
 otolith organs  
 vestibules

**semiconducting films**  
 RT amorphous semiconductors  
 amorphous silicon  
 diamond films  
 energy absorption films  
 ∞ films  
 superconducting films  
 thick films  
 thin films

**semiconductor devices**  
 DEF Electron devices in which the characteristic distinguishing electronic conduction takes place within semiconductors.  
 GS electronic equipment  
 . solid state devices  
 . . **semiconductor devices**  
 . . . avalanche diodes  
 . . . cryosar  
 . . . Barritt diodes  
 . . . charge transfer devices  
 . . . bucket brigade devices  
 . . . charge coupled devices  
 . . . charge injection devices  
 . . . germanium diodes  
 . . . heterojunction devices  
 . . . high electron mobility transistors  
 . . . . MODFETS  
 . . . junction diodes  
 . . . MIM diodes  
 . . . step recovery diodes  
 . . . light emitting diodes  
 . . . metal oxide semiconductors  
 . . . CMOS  
 . . . ITO (semiconductors)  
 . . . SOS (semiconductors)  
 . . . MIM (semiconductors)  
 . . . MIS (semiconductors)  
 . . . MOM (semiconductors)  
 . . . MSM (semiconductors)  
 . . . NDM semiconductor devices  
 . . . neuristors  
 . . . parametric diodes  
 . . . photodiodes  
 . . . photovoltaic cells  
 . . . solar cells



## semiconductor diodes

- . . . . vertical junction solar cells
- . . . Schottky diodes
- . . . semiconductor lasers
- . . . . aluminum gallium arsenide lasers
- . . . . gallium arsenide lasers
- . . . . quantum cascade lasers
- . . . . quantum well lasers
- . . . . YLF lasers
- . . . . SOI (semiconductors)
- . . . thermistors
- . . . thyristors
- . . . . silicon controlled rectifiers
- . . . transferred electron devices
- . . . transistor amplifiers
- . . . transistors
- . . . . bipolar transistors
- . . . . field effect transistors
- . . . . charge flow devices
- . . . . . JFET
- . . . . . MODFETS
- . . . . high electron mobility transistors
- . . . . . MODFETS
- . . . . junction transistors
- . . . . . JFET
- . . . . phototransistors
- . . . . silicon transistors
- . . . . . SOS (semiconductors)
- . . . . single electron transistors
- . . . . cascode devices
- . . . . quantum well infrared photodetectors
- . . . . resonant tunneling diodes
- . . . . TRAPATT devices
- . . . varactor diodes
- . . . varistors
- RT barrier layers
- bubble technique
- chips (memory devices)
- crystal rectifiers
- diffusion electrodes
- diffusion length
- diodes
- doping (materials)
- Gunn diodes
- Gunn effect
- Hall effect
- hybrid circuits
- ion implantation
- ∞ junctions
- microminiaturization
- modulation doping
- molecular electronics
- nanostructures (devices)
- organic semiconductors
- oscillators
- parametric amplifiers
- pentodes
- quantum dots
- quantum Hall effect
- quantum wires
- rectifiers
- semiconductors (materials)
- silicon films
- tetrodes
- triodes
- tunnel junctions
- wafers

### semiconductor diodes

DEF Two-electrode semiconductor devices utilizing the rectifying properties of junctions or point contacts.

- GS electronic equipment
- . diodes
- . . **semiconductor diodes**
- . . . avalanche diodes
- . . . . cryosar
- . . . . Barritt diodes
- . . . . germanium diodes
- . . . . Gunn diodes
- . . . . transferred electron devices
- . . . . junction diodes
- . . . . MIM diodes
- . . . . step recovery diodes
- . . . . light emitting diodes
- . . . . parametric diodes
- . . . . photodiodes
- . . . . Schottky diodes

- . . . tunnel diodes
- . . . . resonant tunneling diodes
- . . . . varactor diodes
- RT MIM diodes
- SIS (semiconductors)
- thermionic diodes

### semiconductor insulator semiconductors

USE **SIS (semiconductors)**

### semiconductor junctions

GS **semiconductor junctions**

- . heterojunctions
- . homojunctions
- . MBM junctions
- . n-n junctions
- . n-p-n junctions
- . p-i-n junctions
- . p-n junctions
- . p-n-p junctions
- . p-n-p-n junctions
- . silicon junctions

RT Barritt diodes

heterojunction devices

∞ junctions

MSM (semiconductors)

n-type semiconductors

p-type semiconductors

Schottky diodes

SIS (semiconductors)

threshold voltage

tunnel junctions

### semiconductor lasers

UF *laser diodes*

GS electronic equipment

. solid state devices

. . semiconductor devices

. . . **semiconductor lasers**

. . . . aluminum gallium arsenide lasers

. . . . gallium arsenide lasers

. . . . quantum cascade lasers

. . . . quantum well lasers

. . . . YLF lasers

stimulated emission devices

. lasers

. . **semiconductor lasers**

. . . aluminum gallium arsenide lasers

. . . gallium arsenide lasers

. . . quantum cascade lasers

. . . quantum well lasers

. . . YLF lasers

RT Bragg reflectors

DBR lasers

distributed feedback lasers

fiber lasers

gadolinium-gallium garnet

gallium arsenides

Gunn effect

injection lasers

laser arrays

laser cavities

optical switching

pulsed lasers

Q switched lasers

quantum dots

quantum wires

solid state lasers

surface emitting lasers

waveguide lasers

### semiconductor plasmas

GS particles

. charged particles

. . energetic particles

. . . plasmas (physics)

. . . . **semiconductor plasmas**

. . corpuscular radiation

. . energetic particles

. . . plasmas (physics)

. . . . **semiconductor plasmas**

RT electron mobility

electron-hole drops

holes (electron deficiencies)

plasma physics

semiconductors (materials)

### semiconductors (materials)

DEF Electronic conductors, with resistivity

in the range between metals and insulators, in which the electrical charge carrier concentration increases with increasing temperature over some temperature range. Certain semiconductors possess two types of carriers, namely, negative electrons and positive holes.

GS **semiconductors (materials)**

. acceptor materials

. . amorphous semiconductors

. . . amorphous silicon

. . donor materials

. . metal oxide semiconductors

. . . CMOS

. . . ITO (semiconductors)

. . . SOS (semiconductors)

. . metal-nitride-oxide-semiconductors

. . metal-nitride-oxide-silicon

. . MIM (semiconductors)

. . MIS (semiconductors)

. . MOM (semiconductors)

. . n-type semiconductors

. . organic semiconductors

. . photoconductors

. . p-type semiconductors

. . superlattices

. . Vycor

RT aluminum arsenides

antislite defects

bipolar transistors

bucket brigade devices

carbon nitrides

carrier density (solid state)

carrier injection

charge injection devices

conducting polymers

conduction bands

conductors

copper indium selenides

doping (materials)

electric conductors

electron affinity

electron density (concentration)

electron tunneling

electrons

emitters

excitons

gadolinium-gallium garnet

gallium nitrides

hole distribution (electronics)

holes (electron deficiencies)

indium antimonides

indium gallium arsenides

indium selenides

indium tellurides

intermetallics

majority carriers

∞ materials

melts (crystal growth)

metalloids

minority carriers

modulation doping

nanostructure (characteristics)

negative electron affinity

organic charge transfer salts

polyacetylene

pseudopotentials

resistors

screen effect

semiconductor devices

semiconductor plasmas

∞ solid state physics

thermoelectric materials

### semiempirical equations

RT algebra

∞ equations

parameterization

### semimetals

USE **metalloids**

### semiregular variable stars

GS celestial bodies

. stars

. . variable stars

. . . **semiregular variable stars**

RT irregular variable stars

periodic variations

**semisolids**  
 RT plastic properties  
 solids  
 thixotropy  
 viscous fluids

**semispan models**  
 GS models  
 . **semispan models**  
 RT aerodynamic configurations  
 aircraft models  
 scale models  
 wind tunnel models

**Senarmont polariscopes**  
 GS measuring instruments  
 . polariscopes  
 . . **Senarmont polariscopes**  
 optical equipment  
 . polariscopes  
 . . **Senarmont polariscopes**  
 RT lasers  
 optical measuring instruments

*senders*  
 USE **transmitters**

*Seneca aircraft*  
 USE **PA-34 Seneca aircraft**

**Senegal**  
 GS nations  
 . **Senegal**  
 RT Africa

**sense organs**  
 GS anatomy  
 . **sense organs**  
 . . chemoreceptors  
 . . ear  
 . . . eardrums  
 . . . eustachian tubes  
 . . . labyrinth  
 . . . . cochlea  
 . . . . . Corti organ  
 . . . . . otolith organs  
 . . . . . semicircular canals  
 . . . . . vestibules  
 . . . middle ear  
 . . eye (anatomy)  
 . . . choroid membranes  
 . . . conjunctiva  
 . . . cornea  
 . . . oculomotor nerves  
 . . . pupils  
 . . . retina  
 . . . . fovea  
 . . . gravireceptors  
 . . . otolith organs  
 . . . baroreceptors  
 . . . mechanoreceptors  
 . . . photoreceptors  
 . . . proprioceptors  
 . . . thermoreceptors  
 RT fingers  
 head (anatomy)  
 nervous system  
 olfactory perception  
 organs  
 perceptual time constant  
 receptors (physiology)  
 sensitometry  
 skin (anatomy)

*senses*  
 USE **sensory perception**

*sensibility*  
 USE **sensitivity**

*sensing*  
 USE **detection**

**sensitivity**  
 DEF Response of a mathematical model to variations of the input parameters. Used for insensitivity and sensibility.  
 UF *insensitivity*

*sensibility*

GS **sensitivity**  
 . anaphylaxis  
 . impact resistance  
 . notch sensitivity  
 . pain sensitivity  
 . photosensitivity  
 . . light adaptation  
 . . phototropism  
 . propellant sensitivity  
 . radiation tolerance  
 . sensitometry  
 . spectral sensitivity

RT acuity  
 adaptation  
 amplification  
 auditory perception  
 dynamic characteristics  
 dynamic response  
 frequency response  
 itching  
 perception  
 precision  
 range (extremes)  
 reaction time  
 ∞ resistance  
 resolution  
 sensitizing  
 shock resistance  
 ∞ thresholds  
 thresholds (perception)  
 tolerances (mechanics)  
 transfer functions  
 transient response  
 visibility  
 vulnerability

**sensitivity analysis**  
*(added February 2001)*  
 DEF Study of how the variation in the output of a system model can be qualitatively or quantitatively apportioned to different input parameters, model structures, or calibration data.  
 RT ∞ analyzing  
 design analysis  
 design optimization  
 error analysis  
 factorial design  
 optimization  
 parameter identification  
 parameterization  
 shape optimization  
 systems analysis

**sensitizing**  
 RT activation  
 actuation  
 anaphylaxis  
 corrosion prevention  
 sensitivity

**sensitometry**  
 DEF The measurement of the light response characteristics of photographic film under specified conditions of exposure and development.  
 GS sensitivity  
 . **sensitometry**  
 RT gravireceptors  
 mechanoreceptors  
 photoreceptors  
 photosensitivity  
 proprioceptors  
 radiation measurement  
 receptors (physiology)  
 sense organs  
 thermoreceptors

*sensor fusion*  
 USE **multisensor fusion**

**sensorimotor performance**  
 UF *motor skills*  
 GS **sensorimotor performance**  
 . psychomotor performance  
 . . psychosomatics  
 RT afferent nervous systems  
 efferent nervous systems  
 human performance  
 human reactions

perceptual time constant  
 physiological tests  
 pilot performance  
 reaction time  
 sensory feedback

∞ **sensors**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF Devices designed to respond to physical stimuli (as temperature, illumination, and motion) and transmit a resulting signal for interpretation, or measurement, or for operating a control. Used for pickoffs and pickups.  
 UF *pickoffs*  
*pickups*  
 RT bioinstrumentation  
 character recognition  
 charge flow devices  
 contour sensors  
 crop identification  
 data acquisition  
 electronic transducers  
 FLIR detectors  
 gas detectors  
 guidance sensors  
 image velocity sensors  
 laser gyroscopes  
 measuring instruments  
 microoptoelectromechanical systems  
 microwave sensors  
 multispectral linear arrays  
 remote sensors  
 robot sensors  
 servomotors  
 smart materials  
 tactile sensors (robotics)  
 torque sensors (robotics)  
 transducers

**sensory deprivation**  
 GS deprivation  
 . **sensory deprivation**  
 RT confinement  
 confining  
 monotony  
 perception

**sensory discrimination**  
 GS discrimination  
 . **sensory discrimination**  
 . . brightness discrimination  
 . . tactile discrimination  
 . . visual discrimination  
 RT speech recognition  
 time discrimination

**sensory feedback**  
 UF *feelings*  
 GS feedback  
 . biofeedback  
 . . **sensory feedback**  
 RT emotional factors  
 emotions  
 moods  
 moon illusion  
 nonlinear feedback  
 perception  
 sensorimotor performance

**sensory perception**  
 UF *senses*  
 GS perception  
 . **sensory perception**  
 . . auditory perception  
 . . consciousness  
 . . extrasensory perception  
 . . kinesthesia  
 . . olfactory perception  
 . . pain  
 . . pain sensitivity  
 . . proprioception  
 . . . . autokinesis  
 . . taste  
 . . touch  
 . . . . tactile discrimination  
 . . vertical perception  
 . . vibration perception  
 . . visual perception

## sensory stimulation

. . . critical flicker fusion  
. . . space perception  
. . . . autokinesis  
. . . visual discrimination

RT afterimages  
anesthesia  
electrocutaneous communication  
itching

### sensory stimulation

GS stimulation  
. **sensory stimulation**

RT chronaxy  
emotional factors  
subliminal stimuli

### sensory thresholds

(added August 2004)  
USE **thresholds (perception)**

### sentences

RT communication theory  
languages  
messages  
semantics  
signal reception  
signal transmission  
speech  
syntax  
talking  
words (language)

### Sentinel system

GS weapon systems  
. **Sentinel system**  
RT antimissile defense  
antimissile missiles  
civil defense  
Nike missiles  
Safeguard system  
Spartan missile  
Sprint missile  
surface to air missiles  
∞ systems

### SEO (Indian spacecraft)

USE **Indian spacecraft**

### SEOCS (satellite)

DEF An ESA meteorological satellite designed for sun-Earth observation and climatology.

GS artificial satellites  
. meteorological satellites  
. . **SEOCS (satellite)**

### SEOS

USE **Synchronous Earth Observatory satellite**

### SEPAC (payload)

DEF Space experiment particle accelerators. A Spacelab 1 payload that experiments on the Earth's ionosphere and magnetosphere. Used for Space Exper with Particle Accelerators.

UF *Space Exper with Particle Accelerators*

GS payloads  
. **SEPAC (payload)**

RT ∞ accelerators  
particle accelerators  
Spacelab

### separated flow

UF *flow separation*  
GS fluid flow  
. viscous flow  
. . boundary layer flow  
. . . **separated flow**  
. . . boundary layer separation  
RT cavitation flow  
conical flow  
Crocco-Lee theory  
flow characteristics  
flow distribution  
forward facing steps  
reattached flow  
reversed flow  
∞ separation

surface roughness effects  
turbulence effects  
vortex flaps

### ∞ separation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *segregation*  
RT adsorption  
aeration  
agglomeration  
agitation  
beneficiation  
boundary layer separation  
breaking  
centrifuging  
chemical fractionation  
chipping  
classifiers  
cleaning  
coagulation  
coalescing  
Coanda effect  
colloids  
concentrating  
condensing  
crystallization  
cutting  
debonding (materials)  
decontamination  
degassing  
dehumidification  
dehydration  
deionization  
delaminating  
deminerizing  
deoxygenation  
deposition  
descaling  
desorption  
dialysis  
diffusion  
dispersing  
dissolving  
distillation  
diverters

∞ division  
drying  
electrodialysis  
electrostatic precipitators  
elimination  
elution  
evaporation  
exchanging  
exclusion  
external store separation  
extraction  
filtration  
flaking  
flashing (vaporizing)  
flotation  
flushing  
foaming  
fractionation  
fracturing  
homogenizing  
ion exchanging  
ion extraction  
ion stripping  
isolation  
leaching  
materials recovery  
melting  
mixing  
osmosis  
percolation  
phase separation (materials)  
polarization (charge separation)  
precipitation (chemistry)  
purging  
purification  
radiochemical separation  
recrystallization  
refining  
removal  
scrapers  
separated flow  
separators  
settling

shaking  
shearing  
size separation  
slicing  
solvent extraction  
sorption  
spacing  
splitting  
spreading  
stage separation  
stripping (distillation)  
sublimation  
swirling  
thermal diffusion  
thermophoresis  
tumbling motion  
vaporizing  
venting  
washing  
zone melting

### separators

UF *battery separators*

GS **separators**  
. classifiers  
. . sizing screens  
. . thickeners (equipment)  
. dividers  
. drying apparatus  
. . desiccators  
. dust collectors  
. evaporators  
. fluid filters  
. . air filters  
. precipitators  
. . electrostatic precipitators  
. sieves  
. spirals (concentrators)  
. stills

RT centrifuges  
cleaners  
columns (process engineering)  
concentrating  
concentrators  
condensers (liquefiers)  
curtains  
∞ diffusers  
diverters  
∞ filters  
floats  
fluidized bed processors  
furnaces  
ion exchange membrane electrolytes  
mixers  
∞ separation  
shakers  
spacers  
traps  
vaporizers  
washers (cleaners)  
washers (spacers)  
windows (apertures)

### septum

RT mediastinum  
membranes  
∞ partitions

### sequencing

RT consecutive events  
coordination  
critical path method  
interruption  
∞ operations  
operations research  
packet switching  
Petri nets  
planning  
priorities  
ranking  
scheduling  
sequential control  
switching  
switching theory  
turnaround (STS)

### sequential analysis

GS statistical analysis  
. **sequential analysis**  
RT quality control

- sampling
  - sorting algorithms
  - temporal logic
- sequential computers**
- GS data processing equipment
    - . computers
    - .. digital computers
    - ... **sequential computers**
- sequential control**
- DEF Control by completion of a series of one or more events.
  - GS automatic control
    - . **sequential control**
  - RT accuracy
    - . computer programming
    - . consecutive events
  - $\infty$  control
    - . data flow analysis
    - . numerical control
    - . sequencing
- Serbska Republic**  
(added June 1996)
- GS nations
    - . **Serbska Republic**
  - RT Bosnia and Herzegovina
    - . Europe
    - . Yugoslavia
- sergeant missiles**
- GS missiles
    - . surface to surface missiles
    - .. **sergeant missiles**
  - RT Juno 1 launch vehicle
    - . Juno 2 launch vehicle
    - . Jupiter C rocket vehicle
    - . Little Joe 2 launch vehicle
    - . solid propellant rocket engines
- sergenium**
- GS chemical elements
    - . actinide series
    - .. transuranium elements
    - ... **sergenium**
    - . nuclides
    - .. isotopes
    - ... radioactive isotopes
    - .... transuranium elements
    - ..... **sergenium**
    - . metals
    - . actinide series
    - .. transuranium elements
    - ... **sergenium**
- series (mathematics)**
- GS analysis (mathematics)
    - . calculus
    - .. **series (mathematics)**
    - ... asymptotic series
    - ... Campbell-Hausdorff series
    - ... cosine series
    - ... Fourier series
    - ... Pade approximation
    - ... power series
    - .... Taylor series
    - ..... MacLaurin series
    - ... progressions
    - ... Prony series
    - ... sine series
    - . real variables
    - .. **series (mathematics)**
    - ... asymptotic series
    - ... Campbell-Hausdorff series
    - ... cosine series
    - ... Fourier series
    - ... Pade approximation
    - ... power series
    - .... Taylor series
    - ..... MacLaurin series
    - ... progressions
    - ... Prony series
    - ... sine series
  - RT Abel function
    - . Chebyshev approximation
    - . divergence
    - . form factors
    - . Fourier-Bessel transformations
    - . function space
- functional analysis
- . Gibbs phenomenon
  - . infinity
  - . series expansion
  - . sums
- series expansion**
- DEF In mathematics, a divergent series of terms the sum of which is asymptotic or ascending.
  - GS expansion
    - . **series expansion**
  - RT asymptotic series
    - . divergence
  - $\infty$  mathematics
    - . series (mathematics)
- serotonin**
- GS drugs
    - . vasoconstrictor drugs
    - .. **serotonin**
    - ... organic compounds
    - ... amines
    - ... tryptamines
    - ... **serotonin**
    - ... cyclic compounds
    - ... heterocyclic compounds
    - ... indoles
    - ... tryptamines
    - ... **serotonin**
- serpentine**
- GS minerals
    - . **serpentine**
  - RT asbestos
    - . chromites
    - . rocks
    - . soils
- serratia**
- GS microorganisms
    - . bacteria
    - .. **serratia**
- SERT 1 spacecraft**
- RT electric propulsion
    - . electric rocket engines
    - . engine tests
    - . space electric rocket tests
  - $\infty$  spacecraft
- SERT 2 spacecraft**
- RT electric propulsion
    - . electric rocket engines
    - . engine tests
    - . space electric rocket tests
  - $\infty$  spacecraft
- SERT (rocket tests)**
- USE **space electric rocket tests**
- serums**
- GS **serums**
    - . blood serum
    - . inoculum
  - RT antiserums
    - $\infty$  fluids
    - . proteins
- service life**
- UF *machine life*
  - GS life (durability)
    - . **service life**
  - RT accelerated life tests
    - $\infty$  equipment
    - . fatigue life
    - . maintenance
    - . retirement for cause
    - . systems health monitoring
- Service Module (ISS)**  
(added March 1999)
- DEF Primary Russian component of the International Space Station providing an early station living quarters and life support system functions to all early elements. Also provides propulsive attitude control and reboost capability for the early station.
  - UF *Zvezda Service Module*
  - GS modules
    - . space station modules
    - .. **Service Module (ISS)**
  - RT International Space Station
    - . life support systems
- service modules**
- GS modules
    - . **service modules**
    - .. Multi-Purpose Logistics Modules
    - . spacecraft components
    - . **service modules**
    - .. Multi-Purpose Logistics Modules
  - RT Apollo spacecraft
    - . command modules
    - . spacecraft docking modules
    - . spacecraft modules
- service oriented architecture**  
(added May 2007)
- DEF A paradigm for organizing and utilizing loosely coupled, platform-independent, distributed capabilities that may be under the control of different ownership domains. The set of components comprising the architecture can be invoked and their interface descriptions can be published and discovered.
  - GS architecture (computers)
    - . **service oriented architecture**
  - RT computer networks
    - . computer systems design
    - . distributed processing
    - . web services
- services**
- GS **services**
    - . medical services
    - . meteorological services
    - . web services
  - RT  $\infty$  food
    - . government procurement
    - . Internet resources
    - . inventory management
    - . logistics
    - . logistics management
    - . materials handling
    - . personnel
    - . procurement
    - . procurement management
    - . products
    - . site selection
    - . support systems
    - . transportation
    - . utilities
- servoamplifiers**
- GS amplifiers
    - . **servoamplifiers**
    - . control equipment
    - . **servoamplifiers**
    - . controllers
    - . servomechanisms
    - .. **servoamplifiers**
  - RT feedback amplifiers
    - . fly by tube control
    - . servocontrol
- servocontrol**
- UF *servostability control*
  - RT aeroservoelasticity
    - . aircraft hydraulic systems
    - . automatic control
  - $\infty$  control
    - . control moment gyroscopes
    - . control theory
    - . digital command systems
    - . feedback control
    - . hydraulic equipment
    - . manipulators
    - . manual control
    - . off-on control
    - . pneumatic equipment
    - . proportional control
    - . remote control
    - . rocket engine control
    - . servoamplifiers
    - . servomechanisms
    - . servomotors
    - . stepping motors
    - . turbojet engine control

## servomechanisms

visual control

### servomechanisms

DEF Control systems incorporating feedback in which one or more of the system signals represent mechanical motion.

- GS controllers
  - . **servomechanisms**
  - . . servoamplifiers
  - . . servomotors
- RT active control
  - actuators
  - aircraft hydraulic systems
  - automatic control
  - automatic control valves
- ∞ automation
- ∞ control
  - control moment gyroscopes
  - electric motors
  - feedback control
  - hydraulic equipment
  - pneumatic equipment
  - radar equipment
  - remote control
  - robots
  - self alignment
  - servocontrol
  - stepping motors
  - tactile sensors (robotics)
  - torque sensors (robotics)

### servomotors

- UF *Magnesyn (trademark)*  
*Selsyns (trademark)*  
*servos*
- GS controllers
  - . servomechanisms
  - . . **servomotors**
  - motors
  - . **servomotors**
- RT actuators
  - amplidynes
  - automatic control
  - electric motors
  - heliostats
- ∞ rotating electrical machines
- ∞ sensors
  - servocontrol
  - slewing
  - synchronizers
  - torque motors

*servos*

USE **servomotors**

*servostability control*

USE **servocontrol**

*SES*

USE **surface effect ships**

*SES (Shuttle)*

USE **Shuttle Engineering Simulator**

### set

- SN (EXCLUDES SET THEORY)
- GS mechanical properties
  - . **set**
- RT deformation
  - shear properties

### set theory

- UF *subsets (mathematics)*
- GS mathematical logic
  - . **set theory**
  - . . Borel sets
  - . . equivalence
  - . . threshold logic
- RT Boolean algebra
  - branching (mathematics)
  - combinatorial analysis
- ∞ conjunction
  - Fibonacci numbers
  - fractals
  - fuzzy sets
  - fuzzy systems
  - graph theory
  - homotropy
  - hyperplanes
  - lattices (mathematics)

- Lebesgue theorem
- Orlicz space
- permutations
- ∞ space
  - subdivisions
  - subgroups
- ∞ theories

*SETI*

USE **Project SETI**

### ∞ setting

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT adjusting
  - coagulation
  - curing
  - hardening (materials)
  - polymerization
  - positioning
  - solidification

### settling

- RT accumulations
  - agglomeration
  - agitation
  - beneficiation
  - coagulation
  - coalescing
  - concentrating
  - crystallization
  - deposition
  - effluents
  - flocculating
  - flotation
  - particle motion
  - precipitation (chemistry)
- ∞ processing
- ∞ separation
  - size separation
  - Stokes law (fluid mechanics)
  - subsidence
  - water treatment

### setups

- RT machining
  - tooling

*Severe Storms Observing Satellite*

USE **StormSat satellite**

### sewage

- GS wastes
  - . **sewage**
- RT activated sludge
  - effluents
  - environment effects
  - human wastes
  - liquid wastes
  - metabolic wastes
  - organic wastes (fuel conversion)
  - sewers
  - solid wastes
  - waste disposal
  - water treatment

### sewage treatment

- GS management
  - . waste management
  - . . waste treatment
  - . . . **sewage treatment**
- RT aerobes
  - anaerobes
  - chemical sterilization
  - filtration
  - Modular Integrated Utility System
  - purification
  - sediments
  - sludge
- ∞ treatment
  - waste disposal

### sewers

- DEF Networks of pipelines for the transportation of metabolic and/or industrial wastes for disposal.
- GS pipelines
  - . **sewers**
- RT drainage
  - effluents

- garbage
- human wastes
- metabolic wastes
- sanitation
- sewage
- waste disposal
- wastes

### sewing

- RT binding
  - ∞ joining
  - needles
  - weaving

### sex

- RT ∞ drives
  - females
  - males
  - sex factor
  - zygotes

### sex factor

- RT females
  - males
  - physiological factors
  - psychological factors
  - sex
  - sex glands

### sex glands

- GS anatomy
  - . genitourinary system
  - . . reproductive systems
  - . . . **sex glands**
  - . . . . gonads
  - . . . . ovaries
  - . . . . testes
  - . . . . prostate gland
  - . glands (anatomy)
  - . . **sex glands**
  - . . . gonads
  - . . . ovaries
  - . . . testes
  - . . . prostate gland
- RT estrogens
  - reproduction (biology)
  - sex factor

### sextants

- DEF Double reflecting instruments for measuring angles, primarily altitudes of celestial bodies.
- GS measuring instruments
  - . optical measuring instruments
  - . . **sextants**
  - . . . optical equipment
  - . . . optical measuring instruments
  - . . . **sextants**
- RT navigation aids
  - position indicators
  - stadimeters
  - theodolites
  - transits

### Seychelles

- (added February 1989)
- GS landforms
  - . islands
  - . . **Seychelles**
  - . . . nations
  - . **Seychelles**
- RT Africa
  - Indian Ocean

### Seyfert galaxies

- GS celestial bodies
  - . galaxies
  - . . active galaxies
  - . . . **Seyfert galaxies**
- RT active galactic nuclei
  - blazars
  - galactic nuclei
  - infrared radiation
  - line spectra
  - luminous intensity
  - Markarian galaxies
  - spiral galaxies
  - stellar spectra

ultraviolet radiation

*SFAR*  
USE **sound fixing and ranging**

*sferics*  
USE **atmospherics**

*SGEMP*  
USE **system generated electromagnetic pulses**

*SGML*  
USE **document markup languages**

*SGR (astronomy)*  
(added January 2000)  
USE **soft gamma repeaters**

*SGR (nuclear reactors)*  
USE **sodium graphite reactors**

**SH waves**  
(added September 1988)  
UF *horizontally polarized shear waves*  
GS elastic waves  
. S waves  
. . **SH waves**  
RT nondestructive tests  
seismic waves  
transverse waves  
ultrasonic tests  
∞ waves

**SH-3 helicopter**  
UF *HSS-2 helicopter*  
*Sea King helicopter*  
*Sikorsky HSS-2 helicopter*  
GS antisubmarine warfare aircraft  
. **SH-3 helicopter**  
Sikorsky aircraft  
. **SH-3 helicopter**  
transport aircraft  
. **SH-3 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **SH-3 helicopter**  
RT S-61 helicopter  
SH-4 helicopter

**SH-4 helicopter**  
GS antisubmarine warfare aircraft  
. **SH-4 helicopter**  
Sikorsky aircraft  
. **SH-4 helicopter**  
transport aircraft  
. **SH-4 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **SH-4 helicopter**  
RT S-61 helicopter  
SH-3 helicopter

**Shackleton bomber**  
GS attack aircraft  
. bomber aircraft  
. . **Shackleton bomber**  
Hawker Siddeley aircraft  
. **Shackleton bomber**  
monoplanes  
. **Shackleton bomber**

**shades**  
RT louvers  
shielding  
∞ shutters

**shadowgraph photography**  
DEF Photography in which steep density gradients in the flow about a body are made visible, the body itself being presented in silhouette. Used for shadowgraphs and spark shadowgraph photography.  
UF *shadowgraphs*  
*spark shadowgraph photography*  
GS imagery  
. photography

. . **shadowgraph photography**  
. . . Schlieren photography  
RT black and white photography  
color photography  
flow visualization  
wind tunnel models

*shadowgraphs*  
USE **shadowgraph photography**

**shadows**  
DEF Darknesses in regions, caused by obstructions between the source of light and the regions.  
GS **shadows**  
. lunar shadow  
. penumbras  
RT cloud cover  
clouds (meteorology)  
darkness  
illuminating  
light (visible radiation)  
night  
self shadowing  
umbras

**shafts (machine elements)**  
UF *axles*  
*journals (shafts)*  
*trunnions*  
GS **shafts (machine elements)**  
. rotating shafts  
. . turbshafts  
RT axes of rotation  
bearings  
bushings  
∞ journals  
∞ loading  
loads (forces)  
mandrels  
mechanical drives  
packings (seals)  
pintles  
pivots  
rotating cylinders  
spindles  
supports  
torque  
transmissions (machine elements)  
vehicle wheels  
wheels

**shakers**  
RT classifiers  
mixers  
separators  
shaking  
sieves  
sizing screens  
vertical motion simulators  
vibration simulators

**shaking**  
GS **shaking**  
. dithers  
RT agitation  
buffeting  
dispersing  
epilepsy  
flapping  
flutter  
mixing  
∞ separation  
shakers  
structural vibration  
suspending (mixing)  
swirling  
vibration

**shale oil**  
GS fuels  
. chemical fuels  
. . hydrocarbon fuels  
. . . fossil fuels  
. . . . **shale oil**  
oils  
. **shale oil**  
resources  
. Earth resources  
. . fossil fuels

. . . **shale oil**  
RT fuel oils  
fuels  
gasoline  
hydrocarbon fuels  
kerogen  
kerosene  
lubricating oils  
paraffins  
retort processing

**shales**  
DEF Fine grained detrital sedimentary rocks, formed by the consolidation (especially by compression) of clay, silt, or mud. They are characterized by finely laminated structures, which impart a fissility approximately parallel to the bedding, along which rocks break readily into thin layers and are commonly most conspicuous on weathered surfaces. They are characterized by an appreciable content of clay minerals and detrital quartz; thinly laminated or fissile claystones, siltstones, or mudstones.  
GS rocks  
. sedimentary rocks  
. . **shales**  
RT boreholes  
clays  
Earth resources  
minerals  
soils

**shallow shell equations**  
RT end plates  
∞ equations  
pressure vessels  
stress analysis

**shallow shells**  
GS shells (structural forms)  
. **shallow shells**  
RT critical loading  
shell stability  
shell theory

**shallow water**  
GS water  
. **shallow water**  
RT cnoidal waves  
fisheries  
oceanography  
oceans  
reefs  
seas  
shorelines  
topography  
water depth

*shanks*  
USE **joints (junctions)**

*Shannon information theory*  
USE **information theory**

**Shannon-Wiener measure**  
RT entropy  
information theory  
random variables

**shape control**  
DEF The control of large flexible platforms in orbit by means of actuators strategically located.  
RT actuators  
Columbus space station  
∞ control  
control theory  
flexible spacecraft  
large space structures  
space platforms  
spacecraft control

**shape functions**  
(added July 1992)  
GS functions (mathematics)  
. **shape functions**  
RT finite element method  
polynomials  
shape optimization

## shape memory alloys

structural analysis

### shape memory alloys

DEF Martensitic alloys (titanium-nickel) which exhibit shape recovery characteristics by stress-induced transformation and reorientation. Reverse transformation during heating restores the original grain structure of the high temperature phase.

GS alloys

. **shape memory alloys**

. . nitinol alloys

ferroelastic materials

. **shape memory alloys**

. . nitinol alloys

RT

ferroelasticity

microstructure

nickel alloys

phase transformations

plastic memory

smart materials

stress-strain diagrams

temperature effects

titanium alloys

transition metals

### shape optimization

(added February 2001)

DEF Process of, or techniques for, determining values of shape design variables that minimize or maximize a selected object function while satisfying limiting constraints.

GS optimization

. design optimization

. . **shape optimization**

RT

aircraft design

airfoil profiles

∞ design

design analysis

fineness ratio

sensitivity analysis

shape functions

structural analysis

structural design

structural design criteria

### shaped charges

DEF An explosive device configured so that its energy can be controlled in one direction.

GS explosive devices

. **shaped charges**

RT

ammunition

bombs (ordnance)

explosive forming

explosives

projectiles

torpedoes

warheads

weapons

### shapers

GS tools

. machine tools

. . **shapers**

RT

grinding machines

milling machines

### shapes

UF *curved surfaces*

*form*

GS

**shapes**

. convexity

. ellipticity

. flatness

. line shape

. ogee shape

. rosette shapes

. T shape

RT

asymmetry

concavity

contour sensors

contours

corners

∞ cross sections

crystal morphology

curvature

curved panels

geoids

geometry

morphology

oblate spheroids

planforms

∞ profiles

profilometers

prolateness

∞ surface geometry

symmetry

topology

### sharks

GS animals

. vertebrates

. . fishes

. . . **sharks**

### sharp leading edges

GS edges

. leading edges

. . **sharp leading edges**

RT

airfoils

forebodies

trailing edges

∞ sharpness

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT

clarity

contrast

precision

slender bodies

### shatter cones

DEF Distinctively striated conical rock fragments along which fracturing has occurred, ranging in length from less than a centimeter to several meters, and generally found in nested or composite groups in rocks of cryptoexplosion structures and believed to be formed by shock waves generated by meteorite impact.

GS cones

. **shatter cones**

rocks

. **shatter cones**

RT

carbonaceous rocks

cometary collisions

crustal fractures

formations

geology

geomorphology

meteorite collisions

meteorite craters

sedimentary rocks

shock loads

striation

structural properties (geology)

*shattering*

USE **fragmentation**

*Shawnee helicopter*

USE **CH-21 helicopter**

∞ shear

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT

dilatational waves

shearing

shears

### shear creep

GS mechanical properties

. creep properties

. . **shear creep**

RT

plastic deformation

tensile creep

*shear disturbances*

USE **S waves**

*shear fatigue*

USE **shear stress**

### shear flow

GS fluid flow

. **shear flow**

RT

coaxial flow

core flow

creep properties

∞ flow

grazing flow

Kolmogorov theory

Krook equation

mixing length flow theory

plastic flow

Richardson number

shear thinning

stratified flow

### shear layers

UF *Chapman shear layer*

RT boundary layers

Earth ionosphere

∞ layers

mixing layers (fluids)

riblets

screech tones

shock layers

shock wave control

∞ transition layers

### shear properties

GS mechanical properties

. **shear properties**

. . shear strength

RT

creep properties

ductility

fatigue (materials)

Hookes law

hysteresis

impact strength

modulus of elasticity

∞ properties

resilience

set

stress relaxation

stresses

stress-strain diagrams

temperature inversions

toughness

### shear strain

DEF The tangent of the angular change, due to force, between two lines originally perpendicular to each other through a point in a body.

RT mechanical properties

Mindlin plates

structural strain

torsional vibration

### shear strength

DEF The maximum shear stress which a material is capable of sustaining. Shear strength is calculated from the maximum load during a shear or torsion test and is based on the original dimensions of the cross section of the specimen.

GS mechanical properties

. shear properties

. . **shear strength**

RT

compressive strength

fiber strength

high strength

interfacial energy

∞ strength

tensile strength

### shear stress

DEF The stress component tangential to the plane on which the forces act. Used for shear fatigue and shearing stress.

UF *shear fatigue*

*shearing stress*

GS

stresses

. **shear stress**

. . torsional stress

RT

interlaminar stress

mechanical properties

shear thinning

shearography

transverse loads

### shear thinning

(added April 2009)

DEF A temporary reduction in the viscosity of certain fluids when they are subjected to increased shear force.

RT nonNewtonian fluids

rheology

shear flow

- shear stress  
viscoelasticity  
viscosity
- shear waves*  
USE **S waves**
- shearing**  
GS cutting  
. **shearing**  
RT blanking (cutting)  
cold working  
failure  
failure modes  
hot working  
loads (forces)  
metal cutting  
metal working  
∞ separation  
∞ shear  
shears  
stamping  
structural strain
- shearing stress*  
USE **shear stress**
- shearography**  
(added February 1996)  
DEF An interferometric method that provides whole field observation of derivatives of small surface displacement and hence, strain.  
GS interferometry  
. **shearography**  
RT displacement measurement  
nondestructive tests  
shear stress  
strain measurement  
stress measurement
- shears**  
GS cutters  
. **shears**  
tools  
. **shears**  
RT machine tools  
saws  
∞ shear  
shearing
- sheaths**  
GS **sheaths**  
. ion sheaths  
. plasma sheaths  
RT ∞ casing  
encapsulating  
fairings  
jackets  
linings  
protectors  
roofs  
walls
- shedding**  
RT ejection  
molting  
peeling  
vortex shedding
- sheds**  
RT shelters
- sheep**  
GS animals  
. vertebrates  
. . . mammals  
. . . **sheep**  
RT livestock  
wool
- sheet metal*  
USE **metal sheets**
- sheet molding compounds**  
(added July 1993)  
DEF Resin matrix of polymer matrix fiber composites formed into sheets and used as molding materials for structures.  
GS molding materials  
. **sheet molding compounds**  
RT composite materials
- composite structures  
fiber composites  
graphite-epoxy composites  
molds  
plastics  
polymer matrix composites  
resin matrix composites  
∞ sheets
- ∞ **sheets**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT coatings  
current sheets  
elastic sheets  
fabrics  
flat plates  
laminates  
membrane structures  
membranes  
metal foils  
metal sheets  
multilayer insulation  
neutral sheets  
panels  
papers  
polymeric films  
sheet molding compounds  
thick plates  
thin plates  
vortex sheets  
vortex streets  
webs (sheets)
- shell anodes**  
GS electrodes  
. anodes  
. . . **shell anodes**  
RT heat measurement
- shell galaxies**  
(added March 1991)  
GS celestial bodies  
. galaxies  
. . . **shell galaxies**  
RT elliptical galaxies  
galactic structure  
interacting galaxies
- shell stability**  
GS mechanical properties  
. dimensional stability  
. . structural stability  
. . . **shell stability**  
stability  
. static stability  
. . dimensional stability  
. . . structural stability  
. . . . **shell stability**  
RT buckling  
fluid filled shells  
liquid filled shells  
orthotropic shells  
plastic shells  
reinforced shells  
shallow shells
- shell stars**  
(added November 1988)  
GS celestial bodies  
. stars  
. . early stars  
. . . hot stars  
. . . . B stars  
. . . . . **shell stars**  
. . peculiar stars  
. . . **shell stars**  
RT stellar envelopes
- shell theory**  
RT perforated shells  
self consistent fields  
shallow shells  
∞ theories
- shellfish**  
DEF Aquatic invertebrate animals having shells.  
RT coastal water  
marine biology
- marine environments  
marine resources  
mollusks
- shells (structural forms)**  
GS **shells (structural forms)**  
. anisotropic shells  
. circular shells  
. conical shells  
. corrugated shells  
. cylindrical shells  
. domes (structural forms)  
. . radomes  
. elastic shells  
. fluid filled shells  
. . liquid filled shells  
. hemispherical shells  
. metal shells  
. orthotropic shells  
. perforated shells  
. plastic shells  
. reinforced shells  
. shallow shells  
. spherical shells  
. . spherical caps  
. thin walled shells  
. toroidal shells  
RT aircraft structures  
arches  
∞ bays (structural units)  
∞ capsules  
clamped structures  
coverings  
cowlings  
enclosures  
fairings  
 housings  
hulls (structures)  
isotenoid structures  
membrane structures  
membranes  
monocoque structures  
nacelles  
pressure vessel design  
protuberances  
rocket engine cases  
skin (structural member)  
walls
- shelters**  
GS **shelters**  
. lunar shelters  
RT buildings  
civil defense  
environmental engineering  
habitability  
sheds  
Starsite program  
survival
- ∞ **shelves**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT bedrock  
cases (containers)  
cliffs  
continental shelves  
racks (frames)  
reefs
- Shenandoah Valley (VA)**  
GS valleys  
. **Shenandoah Valley (VA)**  
RT river basins  
Virginia
- Shenzhou 5 spacecraft**  
(added October 2003)  
DEF Chinese manned spacecraft consisting of a forward orbital module, a re-entry capsule, and an aft service module.  
GS Chinese spacecraft  
. **Shenzhou 5 spacecraft**  
manned spacecraft  
. **Shenzhou 5 spacecraft**  
RT Chinese space program  
Long March launch vehicles
- shergottites**  
(added September 1991)



## shielding

DEF Achondritic stony meteorites composed mainly of pigeonite and maskolyne.

- GS celestial bodies
  - . meteorites
  - . . . stony meteorites
  - . . . . achondrites
  - . . . . . **shergottites**
- RT chassignites  
nakhilites  
SNC meteorites

*Shergotty Nakhla Chassigny meteorites*  
(added March 1998)

USE **SNC meteorites**

## shielding

DEF The arrangement of shields used for any particular circumstance; the use of shields.

- GS **shielding**
  - . electromagnetic shielding
  - . . radio frequency shielding
  - . electrostatic shielding
  - . heat shielding
  - . . reentry shielding
  - . . reusable heat shielding
  - . magnetic shielding
  - . radiation shielding
  - . . solar radiation shielding
  - . spacecraft shielding
- RT ablative nose cones  
absorbers (materials)  
armor  
attenuation  
attenuators  
baffles
  - ∞ barriersblast deflectors  
blinds  
deflectors  
diverters  
enclosures  
flame deflectors  
guards (shields)  
 housings  
linings  
louvers  
manipulators  
panels  
protection  
protectors  
safety devices
  - ∞ screensshades  
suppressors  
windows (apertures)  
windshields

*shields (geology)*

USE **bedrock**

## ∞ shift

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT exchanging  
frequency shift  
phase shift  
shift registers  
transferring

## shift registers

- GS computer components
  - . **shift registers**
- RT computer storage devices  
delay lines (computer storage)  
digital techniques  
registers (computers)
  - ∞ shift

## shifting equilibrium flow

- GS fluid flow
  - . gas flow
  - . . equilibrium flow
  - . . . **shifting equilibrium flow**
- RT frozen equilibrium flow

## Shillelagh missiles

- GS missiles
  - . surface to surface missiles
  - . . antitank missiles

. . . **Shillelagh missiles**

## ship hulls

- GS hulls (structures)
  - . **ship hulls**
- RT hydrodynamic coefficients  
hydrodynamics  
ships  
structural design  
submarines

## ship terminals

- GS terminal facilities
  - . **ship terminals**
- RT artificial harbors  
deepwater terminals  
harbors  
Marots (ESA)  
offshore docking  
tanker terminals
  - ∞ terminalswharves

## ship to shore communication

DEF Communication between a ship at sea and a shore station.

- GS telecommunication
  - . communication
  - . . **ship to shore communication**
- RT data transmission  
radio communication  
ships  
telemetry

## ships

- GS water vehicles
  - . **ships**
  - . . Advanced Range Instrumentation Ship
  - . . aircraft carriers
  - . . cargo ships
  - . . . Savannah nuclear ship
  - . . . . tanker ships
  - . . nuclear powered ships
  - . . . Savannah nuclear ship
  - . . satellite communications ships
  - . . submarines
    - . . . ballistic missile submarines
    - . . . guided missile submarines
    - . . . trident submarine
  - . . surface effect ships
  - . . SWATH (ship)
- RT amphibious vehicles  
antiship missiles  
antiship warfare  
boats  
harbors  
hydrofoil craft  
hydrofoils  
keels  
marine transportation
  - ∞ military vehiclesnavy  
ocean data acquisitions systems  
propellers  
research vehicles  
ship hulls  
ship to shore communication  
shipyards  
surface navigation  
surface vehicles
  - ∞ transport vehiclestransportation energy  
underwater vehicles
  - ∞ vessels

## shipyards

- RT cargo ships  
construction  
enclosures  
industrial areas  
industries  
logistics  
maintenance  
oceanography
  - ∞ portsships  
tanker ships

water vehicles

## Shiva laser system

- DEF High energy multi-arm solid state (Nd doped ED-2 glass) infrared laser system used for laser driven fusion experiments.
- GS stimulated emission devices
  - . lasers
  - . . high power lasers
  - . . . **Shiva laser system**
- RT coherent light  
laser fusion  
laser outputs  
Nova Laser System
  - ∞ systems

## shivering

- GS **shivering**
  - . dithers
- RT body temperature

## shoals

- GS water
  - . **shoals**
- RT beaches  
lakes  
oceanography  
oceans  
reefs  
rivers  
seas  
water depth

## ∞ shock

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT convulsions  
mechanical shock  
shock (physiology)  
shock resistance  
thermal shock

## shock (physiology)

DEF Clinical manifestations of circulatory insufficiency, including hypotension, weak pulse, tachycardia, pallor, and diminished urinary output.

- RT human reactions  
human tolerances  
physiological effects  
physiology
  - ∞ shock

## shock absorbers

DEF Devices for the dissipation of energy used to modify the response of a mechanical system to applied shock.

- RT ∞ absorbers  
absorbers (equipment)  
cushions  
damping  
energy absorption  
hydraulic equipment  
impact  
impact acceleration  
isolators  
landing gear  
mechanical shock  
pneumatic equipment  
silencers  
springs (elastic)  
suspension systems (vehicles)  
vibration damping  
vibration isolators

*shock diffusers*

USE **diffusers**  
**shock wave attenuation**

## shock discontinuity

- GS discontinuity
  - . **shock discontinuity**
- RT density distribution  
wave fronts

## shock fronts

DEF Shock waves regarded as the forward surfaces of fluid regions having characteristics different from those of the region ahead of the wave. The front sides of shock waves.

- GS wave fronts
  - . **shock fronts**
- RT  $\infty$  fronts
  - magnetosheath
  - wave propagation
  - wave scattering
- shock heating**
  - GS heating
    - . kinetic heating
    - . . aerodynamic heating
    - . . . **shock heating**
    - . . . transient heating
    - . . . **shock heating**
  - RT magnetohydrodynamic shear heating
  - plasma heating
- shock layers**
  - RT  $\infty$  layers
    - normal shock waves
    - oblique shock waves
    - shear layers
    - stress waves
  - $\infty$  transition layers
- shock loads**
  - GS loads (forces)
    - . dynamic loads
    - . . transient loads
    - . . . **shock loads**
    - . . . . blast loads
  - RT aerodynamic loads
    - axial compression loads
    - compression loads
    - contact loads
    - crustal fractures
    - impact loads
    - landing loads
    - shatter cones
    - structural design criteria
- shock measuring instruments**
  - GS measuring instruments
    - . **shock measuring instruments**
  - RT accelerometers
    - pressure gages
    - seismographs
    - strain gages
- shock resistance**
  - GS **shock resistance**
    - . impact resistance
  - RT earthquake resistance
    - high acceleration
    - impact
    - mechanical properties
    - mechanical shock
    - propellant sensitivity
  - $\infty$  resistance
    - sensitivity
  - $\infty$  shock
    - thermal shock
    - vibration
- shock simulators**
  - GS simulators
    - . **shock simulators**
  - RT vertical motion simulators
    - vibration simulators
- shock spectra**
  - DEF Plots of the maximum acceleration experienced by single degree of freedom systems as a function of their own natural frequency in response to applied shocks.
  - GS spectra
    - . **shock spectra**
  - RT dynamic structural analysis
    - energy spectra
    - mechanical shock
    - noise spectra
    - stroking tests
    - structural design
    - structural vibration
- shock tests**
  - RT drop tests
    - impact tests
    - load tests
    - railroad humping tests
- $\infty$  tests
  - vibration tests
- shock tubes**
  - DEF Relatively long tubes or pipes in which very brief high speed gas flows are produced by the sudden release of gas at very high pressure into low pressure portions of the tubes; the high speed flows move into the region of low pressure behind shock waves.
  - GS shock wave generators
    - . **shock tubes**
    - . . magnetic annular shock tubes
    - . . . shock tunnels
  - RT gas temperature
    - hotshot wind tunnels
    - hypersonic flow
    - hypersonic wind tunnels
    - hypervelocity wind tunnels
    - low density research
    - low density wind tunnels
    - magnetic pistons
    - test facilities
    - tube lasers
  - $\infty$  tubes
- shock tunnels**
  - DEF Shock tubes used as wind tunnels.
  - GS shock wave generators
    - . shock tubes
    - . . **shock tunnels**
    - . . . test facilities
    - . . . wind tunnels
    - . . . hypersonic wind tunnels
    - . . . . **shock tunnels**
    - . . . hypervelocity wind tunnels
    - . . . . **shock tunnels**
  - RT cascade wind tunnels
    - hotshot wind tunnels
    - hypersonic flow
    - low density research
    - low density wind tunnels
    - supersonic wind tunnels
- shock wave attenuation**
  - UF *shock diffusers*
  - GS attenuation
    - . wave attenuation
    - . . acoustic attenuation
    - . . . **shock wave attenuation**
  - RT atmospheric attenuation
    - noise reduction
    - wave propagation
- shock wave control**
  - RT  $\infty$  control
    - secondary injection
    - shear layers
- shock wave generators**
  - GS **shock wave generators**
    - . shock tubes
    - . . magnetic annular shock tubes
    - . . . shock tunnels
  - RT  $\infty$  generators
    - magnetic pistons
    - pressure sensors
    - pulse generators
    - wave generation
- shock wave interaction**
  - GS wave interaction
    - . **shock wave interaction**
  - RT Godunov method
    - interactional aerodynamics
  - $\infty$  interactions
    - interplanetary shock waves
    - propagation modes
    - scattering
    - wave degradation
- shock wave luminescence**
  - GS emission
    - . light emission
    - . . luminescence
    - . . . **shock wave luminescence**
  - RT low density research
- wave interaction
- shock wave profiles**
  - RT Krook equation
    - pressure distribution
  - $\infty$  profiles
    - velocity distribution
    - wave interaction
- shock wave propagation**
  - GS transmission
    - . wave propagation
    - . . **shock wave propagation**
  - RT atmospheric attenuation
    - Burger equation
    - Crocco method
    - high temperature gases
    - interplanetary shock waves
    - nonequilibrium radiation
    - Rankine-Hugoniot relation
    - secondary injection
    - sound propagation
    - two fluid models
    - wave attenuation
    - wave interaction
- shock waves**
  - DEF Surfaces or sheets of discontinuity (i.e., abrupt changes in conditions) set up in supersonic fields of flow, through which the fluids undergo a finite decrease in velocity accompanied by a marked increase in pressure, density, temperature, and entropy, as occurs, e.g., in supersonic flows about bodies. Used for bow shock waves.
  - UF *bow shock waves*
  - GS elastic waves
    - . **shock waves**
    - . . detonation waves
    - . . interplanetary shock waves
    - . . Mach cones
    - . . normal shock waves
    - . . oblique shock waves
    - . . Riemann waves
    - . . sonic booms
  - RT adiabatic equations
    - aerodynamic noise
    - blast loads
  - $\infty$  blasts
    - bow waves
    - Burnett equations
    - caustic lines
    - crustal fractures
    - detonation
    - earthquake damage
    - earthquake resistance
    - earthquake resistant structures
    - earthquakes
    - electrostatic waves
    - exploding wires
    - explosions
    - gas temperature
    - geodynamics
    - Hugoniot equation of state
    - hypersonic flow
    - hypersonic shock
    - hypersonic wakes
    - impact
    - implosions
    - longitudinal waves
    - Mach number
    - Mach reflection
    - magnetohydrodynamic waves
    - mechanical shock
    - molecular relaxation
    - noise (sound)
    - novae
    - plane waves
    - planetary quakes
    - plasma waves
    - plumes
    - pressure pulses
    - seismic waves
    - sound pressure
    - sound waves
    - stress waves
    - supersonic flow
  - $\infty$  transition layers
    - transonic flow
    - tsunami waves

## Shoemaker-Levy 9 comet

underwater acoustics  
underwater communication  
∞ waves  
wedge flow  
Whitham rule

### Shoemaker-Levy 9 comet

(added June 1994)  
GS celestial bodies  
. comets  
. . Shoemaker-Levy 9 comet  
RT cometary collisions  
Jupiter (planet)

### shoes

GS clothing  
. shoes  
RT boots (footwear)  
leather  
protective clothing  
socks

### Shooting Star aircraft

USE T-33 aircraft

### shops

RT maintenance

### Shoran

DEF A precision electronic position fixing system using a pulse transmitter and receiver and two transponder beacons at fixed points. Used for short range navigation.  
UF short range navigation  
GS navigation  
. radio navigation  
. . hyperbolic navigation  
. . . Shoran  
RT air navigation  
Decca navigation  
distance measuring equipment  
navigation aids  
solar compasses

### shorelines

RT beaches  
coastal water  
coasts  
lakes  
oceanography  
oceans  
rivers  
shallow water  
tidal flats  
wetlands

### Short Belfast C MK-1 aircraft

USE SC-5 aircraft

### short circuit currents

DEF The steady value of the input alternating currents that flow when the output direct current terminals are short-circuited and rated line alternating voltage is applied to the line terminals.  
GS electric current  
. short circuit currents  
RT open circuit voltage  
photovoltaic cells  
short circuits  
solar cells  
volt-ampere characteristics

### short circuits

DEF An abnormal connection of relatively low resistance between two points on a circuit. The result is a flow of excess (often damaging) current between these points.  
GS electrical faults  
. short circuits  
RT circuits  
electric arcs  
failure  
jumpers  
short circuit currents  
sneak circuit analysis  
system failures

### short cracks

GS fractures (materials)

. cracks  
. . short cracks  
RT crack geometry  
crack initiation  
crack propagation  
fatigue life  
fracture mechanics  
metal fatigue

### short haul aircraft

GS transport aircraft  
. short haul aircraft  
. . C-8A augmentor wing aircraft  
. . Cessna 402B aircraft  
. . Mercure aircraft  
RT air transportation  
∞ aircraft  
aircraft design  
airline operations  
passenger aircraft  
V/STOL aircraft

### short range ballistic missiles

GS missiles  
. ballistic missiles  
. . short range ballistic missiles  
. surface to surface missiles  
. . short range ballistic missiles  
RT field army ballistic missiles  
intermediate range ballistic missiles

### short range navigation

USE Shoran

### Short SC-1 aircraft

USE SC-1 aircraft

### Short SC-5 aircraft

USE SC-5 aircraft

### Short SC-7 aircraft

USE SC-7 aircraft

### short takeoff & vertical landing aircraft

USE STOVL aircraft

### short takeoff aircraft

UF STOL aircraft  
GS V/STOL aircraft  
. short takeoff aircraft  
. . Aladin 2 aircraft  
. . Breguet 940 aircraft  
. . Breguet 941 aircraft  
. . C-8A augmentor wing aircraft  
. . C-15 aircraft  
. . C-123 aircraft  
. . DHC 4 aircraft  
. . DHC 5 aircraft  
. . Questol aircraft  
. . U-10 aircraft

RT ∞ aircraft  
circulation control airfoils  
compound helicopters  
externally blown flaps  
fan in wing aircraft  
helicopters  
JATO engines  
jet aircraft  
jet flaps  
lift fans  
lifting rotors  
∞ military aircraft  
powered lift aircraft  
rotary wing aircraft  
Siebel aircraft  
STOVL aircraft  
∞ subsonic aircraft  
takeoff runs  
tilt wing aircraft  
vertical takeoff aircraft  
∞ winged vehicles

### short wave radiation

SN (RADIO WAVES)  
GS electromagnetic radiation  
. radio waves  
. . short wave radiation  
. . . microwaves  
. . . . centimeter waves

. . . . cosmic microwave background radiation  
. . . . decimeter waves  
. . . . microwave emission  
. . . . millimeter waves  
. . . . submillimeter waves  
RT far infrared radiation  
high frequencies  
long wave radiation  
monochromatic radiation  
∞ radiation  
Surface Meteorology and Solar Energy project  
Surface Radiation Budget project

### short wave radio transmission

GS transmission  
. electromagnetic wave transmission  
. . radio transmission  
. . . short wave radio transmission  
. signal transmission  
. . radio transmission  
. . . short wave radio transmission  
RT high frequencies  
wave propagation

### shortening

USE reduction

### ∞ shot

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ammunition  
launching  
orbital shots  
pellets  
shot noise  
shot peening

### shot noise

DEF Quantum noise caused by electric current fluctuations attributable to the discrete nature of charge carriers.  
GS electromagnetic interference  
. radio frequency interference  
. . electromagnetic noise  
. . . shot noise  
RT Barritt diodes  
∞ shot  
thermal noise

### shot peening

GS hardening (materials)  
. shot peening  
metal finishing  
. peening  
. . shot peening  
RT cold working  
descaling  
fatigue (materials)  
metal working  
∞ shot  
strain hardening  
surface finishing  
work hardening

### shoulders

RT joints (anatomy)  
scapula

### ∞ showers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cosmic ray showers  
flood predictions  
meteoroid showers  
rain  
rain forests  
rainstorms

### shrapnel

RT fragmentation  
fragments  
projectiles  
weapons

### shredding

GS comminution  
. shredding  
RT composting

- cutting  
tearing
- Shrike missile**  
GS missiles  
. air to surface missiles  
. . **Shrike missile**  
RT solid propellant rocket engines
- shrinkage**  
RT casting  
contraction  
growth  
∞ reduction  
sintering  
temperature inversions  
warping
- shrouded bodies*  
USE **shrouds**
- shrouded nozzles**  
RT annular nozzles  
nozzle geometry  
nozzle walls  
∞ nozzles
- shrouded propellers**  
UF *ducted propellers*  
GS propellers  
. **shrouded propellers**  
RT ducted fans  
ring wings  
thrust augmentation  
XV-11A aircraft
- shrouded turbines**  
GS turbomachinery  
. turbines  
. . **shrouded turbines**
- shrouds**  
UF *shrouded bodies*  
RT coverings  
ducted bodies  
rigging
- shunts*  
USE **bypasses**  
**circuits**
- shutdowns**  
DEF The processes of decreasing engine thrusts to zero.  
RT deactivation  
engines  
∞ SCRAM
- ∞ **shutters**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT blinds  
camera shutters  
louvers  
shades
- Shuttle Avionics Integration Laboratory*  
USE **SAIL project**
- Shuttle Boosters*  
USE **Space Shuttle Boosters**
- Shuttle Derived Vehicles**  
DEF New configuration resulting from the production and operation of the Space Shuttle. Used for SDV.  
UF *SDV*  
RT Advanced Launch System (STS)  
manned spacecraft  
Space Shuttle orbiters  
space shuttles  
∞ spacecraft  
spacecraft design
- Shuttle Engineering Simulator**  
DEF Training equipment for crew members in mission operation procedures including various approach maneuvers, braking, final approach, etc.  
UF *SES (Shuttle)*  
GS simulators
- Shuttle Engineering Simulator**  
RT space shuttles
- shuttle glow*  
USE **spacecraft glow**
- Shuttle Imaging Radar**  
UF *Earth resources shuttle imaging radar*  
*SIR-A*  
*SIR-B*  
*SIR-C*  
*SIR-D*  
GS radar  
. Doppler radar  
. . pulse Doppler radar  
. . . **Shuttle Imaging Radar**  
. imaging radar  
. . **Shuttle Imaging Radar**  
. pulse radar  
. . pulse Doppler radar  
. . . **Shuttle Imaging Radar**  
. space based radar  
. . **Shuttle Imaging Radar**  
. synthetic aperture radar  
. . **Shuttle Imaging Radar**  
RT Earth observations (from space)  
radar geology  
radar imagery  
remote sensing  
Space Shuttle payloads  
synthetic arrays
- Shuttle Mission Simulator**  
UF *SMS (Shuttle)*  
GS simulators  
. **Shuttle Mission Simulator**
- Shuttle Orbiters*  
USE **Space Shuttle orbiters**
- Shuttle pallet satellites**  
DEF Reusable pallet type structures designed to be shuttle launched which will act as building blocks for larger platforms. Used for SPAS (ESA platforms).  
UF *SPAS (ESA platforms)*  
GS artificial satellites  
. **Shuttle pallet satellites**  
RT space shuttles
- Shuttle Superlightweight Tank*  
(added June 1998)  
USE **external tanks**  
**propellant tanks**
- SI*  
USE **International System of Units**
- sialon**  
DEF Any composition containing silicon, aluminum, oxygen, and nitrogen and usually produced by the high-temperature reactions among the ingredients.  
GS mixtures  
. **sialon**  
RT aluminum  
ceramics  
high temperature  
nitrogen  
oxygen  
reaction bonding  
refractory materials  
silicon nitrides  
sintering
- SIAM missiles**  
UF *self initiated anti-aircraft missiles*  
GS missiles  
. anti-aircraft missiles  
. . **SIAM missiles**  
RT air to air missiles  
antimissile missiles
- Siberia**  
RT Arctic regions  
Asia
- U.S.S.R.
- SIC (coefficient)*  
USE **structural influence coefficients**
- Sicily**  
GS landforms  
. islands  
. . **Sicily**  
RT Italy  
Mediterranean Sea
- sicknesses**  
GS **sicknesses**  
. altitude sickness  
. decompression sickness  
. motion sickness
- SID (ionospheric disturbances)*  
USE **sudden ionospheric disturbances**
- side inlets**  
GS intake systems  
. **side inlets**  
RT air intakes  
bypass ratio  
hypersonic inlets  
inlet airframe configurations  
nose inlets  
scoops  
supersonic inlets  
∞ water intakes
- sidebands**  
RT ∞ bands  
double sideband transmission  
selective fading  
single sideband transmission
- sidelobe reduction**  
GS attenuation  
. **sidelobe reduction**  
RT apodization  
horn antennas  
radar antennas  
radar attenuation  
radar reception  
radar reflectors  
radar resolution  
∞ reduction  
sidelobes
- sidelobes**  
GS distribution (property)  
. radiation distribution  
. . antenna radiation patterns  
. . . **sidelobes**  
RT antenna design  
∞ lobes  
near fields  
sidelobe reduction
- side-looking radar**  
GS radar  
. synthetic aperture radar  
. . **side-looking radar**  
RT airborne radar  
change detection  
imaging radar  
radar imagery  
radar scanning  
search radar
- sidereal time**  
DEF Time based upon the rotation of the Earth relative to the vernal equinox.  
GS time  
. **sidereal time**  
RT astronomy  
Earth rotation  
stellar motions  
time measurement  
units of measurement
- siderite meteorites*  
USE **iron meteorites**
- siderites**  
DEF A spathic iron ore; an iron carbonate.  
GS carbon compounds  
. carbonates

## siderophile elements

- . . siderites
- iron compounds
- . siderites
- minerals
- . siderites

### siderophile elements

(added January 2002)

DEF Elements having a chemical affinity for iron, and normally found in the metal-rich interiors of compositionally segregated planets and asteroids.

GS chemical elements

- . siderophile elements

RT chondrites

- Earth mantle
- geochemistry
- iron
- lunar composition
- meteoritic composition
- mineralogy
- minerals
- petrography
- planetary composition
- trace elements

### sides

RT edges

- geometry
- rims
- walls

### sideslip

RT maneuvers

- roll
- skidding

∞ slip

- spacecraft motion
- yaw

### sidewash

USE **backwash**

### Sidewinder missiles

GS missiles

- . air to air missiles
- . . Sidewinder missiles
- . antiaircraft missiles
- . . Sidewinder missiles

### Siebel aircraft

RT ∞ aircraft

- short takeoff aircraft

### Siemens 2002 computer

GS data processing equipment

- . computers
- . . Siemens 2002 computer

### Sierra Leone

GS nations

- . Sierra Leone

RT Africa

### Sierra Nevada Mountains (CA)

GS landforms

- . mountains
- . . Sierra Nevada Mountains (CA)

RT California

### sieves

GS separators

- . sieves

RT fluid filters

- shakers
- sizing screens
- wire cloth

### sight

USE **visual perception**

### SIGMA 5 computer

GS data processing equipment

- . computers
- . . analog computers
- . . . SIGMA 5 computer
- . . digital computers
- . . . SIGMA 5 computer

### SIGMA 7

GS manned spacecraft

- . Mercury spacecraft
- . . SIGMA 7
- reentry vehicles
- . recoverable spacecraft
- . . Mercury spacecraft
- . . . SIGMA 7
- soft landing spacecraft
- . Mercury spacecraft
- . . SIGMA 7
- space capsules
- . Mercury spacecraft
- . . SIGMA 7

RT Mercury MA-8 flight

### SIGMA 9 computer

GS data processing equipment

- . computers
- . . digital computers
- . . . SIGMA computers
- . . . . SIGMA 9 computer

### SIGMA computers

GS data processing equipment

- . computers
- . . digital computers
- . . . SIGMA computers
- . . . . SIGMA 9 computer

### Sigma Orionis

GS celestial bodies

- . stars
- . . double stars
- . . . binary stars
- . . . . Sigma Orionis
- . . early stars
- . . . hot stars
- . . . . B stars
- . . . . . Sigma Orionis
- . . peculiar stars
- . . . Sigma Orionis

RT Orion constellation

- stellar systems

### sigma-mesons

GS particles

- . elementary particles
- . . bosons
- . . mesons
- . . . vector mesons
- . . . . sigma-mesons
- . . fermions
- . . . baryons
- . . . . sigma-mesons
- . . hadrons
- . . . baryons
- . . . . sigma-mesons
- . . mesons
- . . . vector mesons
- . . . . . sigma-mesons
- . . nuclear particles
- . . bosons
- . . mesons
- . . . vector mesons
- . . . . . sigma-mesons

RT charged particles

- eta-mesons

### signal analysis

GS data processing

- . signal analysis
- . . cepstral analysis

RT ∞ analyzing

- digital radar systems
- frequency analyzers
- Gabor transformation
- phase deviation
- signal measurement
- spectrum analysis
- wavelet analysis

### signal analyzers

GS measuring instruments

- . analyzers
- . . signal analyzers

RT analog computers

- autodynes

### signal detection

GS detection

- . signal detection

- . . correlation detection

RT autodynes

∞ detectors

- discrimination
- dynamic range
- phase detectors
- preamplifiers
- radar detection
- signal measurement
- sound transducers
- telecommunication

### signal detectors

UF signal discriminators

RT anticoincidence detectors

- autodynes

∞ detectors

- discrimination
- microwave sensors
- preamplifiers
- signal measurement
- sound transducers
- telecommunication

### signal discriminators

USE **signal detectors**

### signal distortion

GS distortion

- . signal distortion

RT intersymbolic interference

- radio signals
- scrambling (communication)

### signal encoding

GS coding

- . signal encoding
- . . amplitude modulation
- . . . quadrature amplitude modulation
- . . frequency modulation
- . . . feedback frequency modulation
- . . . FM/PM (modulation)
- . . . frequency shift keying
- . . pulse frequency modulation
- . . phase modulation
- . . . FM/PM (modulation)
- . . phase shift keying
- . . . binary phase shift keying
- . . . quadrature phase shift keying
- . . pulse modulation
- . . . pulse amplitude modulation
- . . . pulse code modulation
- . . . delta modulation
- . . . differential pulse code modulation
- . . . pulse frequency modulation
- . . . pulse time modulation
- . . . pulse duration modulation
- . . . pulse position modulation
- . . trellis coding

RT concatenated codes

- digital to analog converters
- pulse frequency modulation telemetry
- redundancy encoding
- Reed-Solomon codes
- scrambling (communication)
- telecommunication
- transmitters
- video compression
- Viterbi decoders
- voice data processing
- wavelet analysis

### signal fadeout

USE **signal fading**

### signal fading

UF signal fadeout

GS fading

- . signal fading
- . . Rayleigh fading
- . . selective fading

RT acoustic instability

- atmospheric scattering
- attenuation
- diffraction patterns
- electromagnetic absorption
- ground effect (communications)
- radio frequency interference
- radio scattering

- reception diversity
  - signal measurement
  - smear
  - sound intensity
- signal fading rate**
- GS rates (per time)
  - . **signal fading rate**
  - RT fading
  - selective fading
  - sound intensity
- signal flow graphs**
- RT duality principle
  - ∞ flow graphs
  - network analysis
  - Richards theorem
  - sneak circuit analysis
- signal generators**
- DEF Shielded sources of voltage or power, the output level and frequency of which are calibrated, and usually variable over a range.
  - GS **signal generators**
  - . frequency synthesizers
  - . function generators
  - RT circuits
  - ∞ generators
  - Hall generators
  - oscillators
  - sirens
  - solid state devices
  - sound generators
  - subharmonic generators
  - voltage generators
- signal measurement**
- UF *electronic signal measurement*
  - RT electromagnetic measurement
  - ionospheric propagation
  - ∞ measurement
  - signal analysis
  - signal detection
  - signal detectors
  - signal fading
  - signal processing
  - signal to noise ratios
- signal mixing**
- GS mixing
  - . **signal mixing**
  - RT auditory signals
  - error signals
  - four-wave mixing
  - magnetic signals
  - radio signals
- signal processing**
- GS data processing
  - . **signal processing**
  - . . . space-time adaptive processing
  - RT audio signals
  - companding
  - direction finding
  - discrete cosine transform
  - equalizers (circuits)
  - frequency domain analysis
  - interference immunity
  - maximum entropy method
  - message processing
  - multisensor fusion
  - onboard data processing
  - ∞ processing
  - signal measurement
  - smoke detectors
  - surface acoustic wave devices
  - telemetry
  - time domain analysis
  - VHSIC (circuits)
  - video signals
  - Viterbi decoders
  - wavelet analysis
- signal reception**
- GS **signal reception**
  - . homodyne reception
  - . radar reception
  - . radio reception
  - . television reception
  - RT antenna gain
- preamplifiers
  - ∞ receiving
  - sentences
  - transmission rate (communications)
  - vocoders
- signal reflection**
- GS echoes
  - . **signal reflection**
  - reflection
  - . **signal reflection**
  - RT cepstral analysis
  - spread reflection
  - transmission
  - wave reflection
- signal stabilization**
- GS stabilization
  - . **signal stabilization**
  - RT frequency control
  - transmission circuits
- signal to noise ratios**
- DEF Ratios which measure the comprehensibility of a data source or transmission link, usually expressed as the root mean square signal amplitude divided by the root mean square noise amplitude.
  - GS ratios
  - . **signal to noise ratios**
  - RT amplitude distribution analysis
  - attenuation
  - background noise
  - bit error rate
  - carrier to noise ratios
  - channel noise
  - communication theory
  - companding
  - correlation detection
  - dark current
  - dynamic range
  - electromagnetic interference
  - electromagnetic noise
  - false alarms
  - image contrast
  - image enhancement
  - interference immunity
  - low noise
  - matched filters
  - maximum entropy method
  - ∞ noise
  - noise propagation
  - noise spectra
  - noise threshold
  - random noise
  - random signals
  - signal measurement
  - ∞ signals
  - white noise
- signal transmission**
- GS transmission
  - . **signal transmission**
  - . . . data transmission
  - . . . . automatic picture transmission
  - . . . . multiple access
  - . . . . . Aloha system
  - . . . . . carrier sense multiple access
  - . . . . . code division multiple access
  - . . . . . demand assignment multiple access
  - . . . . . frequency division multiple access
  - . . . . . time division multiple access
  - . . . . . packet transmission
  - . . . . . Aloha system
  - . . . . . single channel per carrier transmission
  - . . . . . microwave attenuation
  - . . . . . radar transmission
  - . . . . . radio transmission
  - . . . . . double sideband transmission
  - . . . . . ionospheric propagation
  - . . . . . ionospheric F-scatter propagation
  - . . . . . microwave transmission
  - . . . . . multipath transmission
  - . . . . . short wave radio transmission
  - . . . . . single sideband transmission
  - . . . . . spread spectrum transmission
- . . . transequatorial propagation
  - . . . transhorizon radio propagation
  - . . . satellite transmission
  - . . . telemetry
  - . . . . . biotelemetry
  - . . . . . P.A.C.M. telemetry
  - . . . . . PCM telemetry
  - . . . . . radio telemetry
  - . . . . . pulse frequency modulation telemetry
  - . . . television transmission
- RT audio signals
- code division multiplexing
  - message processing
  - messages
  - multiplexing
  - orthogonal multiplexing theory
  - packet switching
  - pulse communication
  - radar attenuation
  - radio attenuation
  - radio scattering
  - sentences
  - sound transmission
  - syllables
  - talking
  - telecommunication
  - transmission efficiency
  - transmission rate (communications)
  - video signals
  - wireless communication
- signal-processing-in-the-element detectors*  
(added January 2000)
- USE **infrared detectors**
- ∞ **signals**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT audio signals
  - auditory signals
  - beacons
  - bells
  - chirp signals
  - electric pulses
  - error signals
  - horns
  - magnetic signals
  - messages
  - pseudorandom sequences
  - pyrotechnics
  - radio signals
  - random signals
  - signal to noise ratios
  - sirens
  - sound generators
  - symbols
  - telecommunication
  - time signals
  - video signals
  - visual signals
  - visual stimuli
- signature analysis**
- RT ∞ analyzing
  - cepstral analysis
  - detection
  - imagery
  - infrared signatures
  - microwave signatures
  - missile signatures
  - radar signatures
  - signatures
  - target recognition
- signatures**
- GS **signatures**
  - . infrared signatures
  - . magnetic signatures
  - . missile signatures
  - . radar signatures
  - . spectral signatures
  - . . . microwave signatures
  - RT amplitude distribution analysis
  - biomarkers
  - detection
  - representations
  - signature analysis
  - target recognition

## significance

video landmark acquisition and tracking

### significance

RT confidence limits  
correlation  
covariance  
degrees of freedom  
finite difference theory  
null hypothesis  
numerical analysis  
regression analysis  
statistical tests  
teleconnections (meteorology)

*signs (symbols)*

USE **symbols**

### signs and symptoms

UF *symptoms*  
*syndromes*  
GS **signs and symptoms**  
. acquired immunodeficiency syndrome

. bradycardia  
. cough  
. dizziness  
. dyspnea  
. edema  
. headache  
. hematuria  
. kidney stones  
. leukopenia  
. nausea  
. vertigo

RT asphyxia  
diseases  
hallucinations  
∞ indication  
symptomology

### Sikhote-Alin meteorite

GS celestial bodies  
. meteorites  
. iron meteorites  
. . . **Sikhote-Alin meteorite**

### Sikkim

GS nations  
. **Sikkim**  
RT Asia  
Bhutan  
Himalayas  
India

### Sikorsky aircraft

GS **Sikorsky aircraft**  
. CH-3 helicopter  
. CH-34 helicopter  
. CH-54 helicopter  
. H-19 helicopter  
. H-53 helicopter  
. H-56 helicopter  
. H-60 Helicopter  
. S-58 helicopter  
. S-61 helicopter  
. S-67 helicopter  
. SH-3 helicopter  
. SH-4 helicopter  
. Sikorsky Whirlwind helicopter  
. UH-34 helicopter  
. UH-60A helicopter  
. UH-61A helicopter  
RT ∞ aircraft

*Sikorsky HSS-2 helicopter*

USE **SH-3 helicopter**

*Sikorsky S-58 helicopter*

USE **S-58 helicopter**

*Sikorsky S-61 helicopter*

USE **S-61 helicopter**

*Sikorsky S-64 helicopter*

USE **CH-54 helicopter**

*Sikorsky S-65 helicopter*

USE **H-53 helicopter**

*Sikorsky S-67 helicopter*

USE **S-67 helicopter**

### Sikorsky Whirlwind helicopter

GS Sikorsky aircraft

. **Sikorsky Whirlwind helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . . **Sikorsky Whirlwind helicopter**  
RT ∞ aircraft

### silanes

GS hydrogen compounds  
. hydrides  
. . **silanes**  
. . . chlorosilanes  
. . . methyl chlorosilanes  
silicon compounds  
. **silanes**  
. chlorosilanes  
. methyl chlorosilanes  
RT disilicides  
polycarbosilanes  
polysilanes

### silence

RT noise reduction  
transmission loss

### silencers

RT attenuators  
damping  
inhibitors  
mufflers  
shock absorbers  
squelch circuits  
suppressors  
zero sound

*silica*

USE **silicon dioxide**

### silica gel

DEF A colloidal, highly absorbent silica used as a dehumidifying and dehydrating agent, as a catalyst carrier, and sometimes as a catalyst.

GS gels  
. **silica gel**

RT aerogels  
dehumidification  
dehydration  
drying  
silicon dioxide  
xerogels

### silica glass

GS glass  
. **silica glass**  
RT glass coatings  
glass electrodes  
glass fibers  
glassware  
sands  
silicon dioxide

### silicates

GS silicon compounds  
. **silicates**  
. . aluminum silicates  
. . . andesite  
. . . feldspars  
. . . gehlenite  
. . . kaolinite  
. . . montmorillonite  
. . . pyrophyllite  
. . . plagioclase  
. . aragonite  
. beryl  
. . alexandrite  
. . calcium silicates  
. . . gehlenite  
. . cordierite  
. . fayalite  
. . fluorosilicates  
. . forsterite  
. . garnets  
. . . gadolinium-gallium garnet  
. . . yttrium-aluminum garnet  
. . . yttrium-iron garnet  
. . merwinite  
. . monticellite  
. . nepheline

. . potassium silicates  
. . pyroxenes  
. . . enstatite  
. . sodium silicates  
. . . spodumene  
. . . talc  
. . . tourmaline  
. . zeolites  
RT akermanite  
amphiboles  
disilicides  
minerals  
silicides  
silicon dioxide  
tetraethyl orthosilicate  
vermiculite

### silicides

GS silicon compounds  
. **silicides**  
. . disilicides  
RT intermetallics  
silicates

### silicon

GS chemical elements  
. metalloids  
. . **silicon**  
. . . amorphous silicon  
. . . porous silicon  
. . . silicon isotopes  
RT float zones  
reaction bonding  
Schottky diodes  
silicon alloys

### silicon alloys

GS alloys  
. **silicon alloys**  
RT aluminum alloys  
germanium alloys  
iron alloys  
magnesium alloys  
microstructure  
nickel alloys  
silicon

### silicon carbides

GS carbon compounds  
. carbides  
. . **silicon carbides**  
silicon compounds  
. **silicon carbides**  
RT abrasives  
carbon-silicon carbide composites  
Carborandum (trademark)  
ceramic fibers  
nanocomposites  
polycarbosilanes

### silicon compounds

GS **silicon compounds**  
. flint  
. organic silicon compounds  
. . triphenyl silicon  
. silanes  
. . chlorosilanes  
. . methyl chlorosilanes  
. silicates  
. . aluminum silicates  
. . . andesite  
. . . feldspars  
. . . gehlenite  
. . . kaolinite  
. . . montmorillonite  
. . . pyrophyllite  
. . . plagioclase  
. . aragonite  
. . beryl  
. . . alexandrite  
. . calcium silicates  
. . . gehlenite  
. . cordierite  
. . fayalite  
. . fluorosilicates  
. . forsterite  
. . garnets  
. . . gadolinium-gallium garnet  
. . . yttrium-aluminum garnet  
. . . yttrium-iron garnet

- . . merwinite
  - . . monticellite
  - . . nepheline
  - . . potassium silicates
  - . . pyroxenes
  - . . . enstatite
  - . . sodium silicates
  - . . . spodumene
  - . . . talc
  - . . . tourmaline
  - . . zeolites
  - . silicides
  - . . disilicides
  - . silicon carbides
  - . silicon nitrides
  - . silicon oxides
  - . . muscovite
  - . . nephelite
  - . . silicon dioxide
  - . . . quartz
  - . . . . coesite
  - . . . . stishovite
  - . . spodumene
  - . silicon tetrachloride
  - RT akermanite
  - ∞ chemical compounds
  - ∞ Group 4A compounds
  - methyl polysiloxanes
  - polysiloxanes
  - silicones
  - siloxanes
- silicon controlled rectifiers**
- UF *SCR (rectifiers)*
  - GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . thyristors
  - . . . . **silicon controlled rectifiers**
  - rectifiers
  - . thyristors
  - . . **silicon controlled rectifiers**
  - RT current converters (AC to DC)
  - thyratrons
- silicon dioxide**
- DEF The chemically resistant dioxide of silicon. Used for Refrasil (trademark) and silica.
  - UF *Refrasil (trademark)*
  - silica*
  - GS chalcogenides
  - . oxides
  - . . dioxides
  - . . . **silicon dioxide**
  - . . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
  - . . silicon oxides
  - . . . **silicon dioxide**
  - . . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
  - silicon compounds
  - . silicon oxides
  - . . **silicon dioxide**
  - . . . quartz
  - . . . . coesite
  - . . . . . stishovite
  - RT borosilicate glass
  - ceramics
  - E glass
  - glass
  - metallic glasses
  - obsidian
  - porcelain
  - quartz crystals
  - rhyolite
  - S glass
  - sands
  - silica gel
  - silica glass
  - silicates
  - Vycor
  - xerogels
- silicon films**
- RT amorphous silicon
  - ∞ films
  - semiconductor devices
  - SOI (semiconductors)
- thin films
- silicon isotopes**
- GS chemical elements
  - . metalloids
  - . . silicon
  - . . . **silicon isotopes**
  - . . . . nuclides
  - . . . . . isotopes
  - . . . **silicon isotopes**
- silicon junctions**
- GS semiconductor junctions
  - . **silicon junctions**
  - RT amorphous silicon
  - heterojunctions
  - homojunctions
  - SIS (semiconductors)
  - SOI (semiconductors)
  - threshold voltage
- silicon nitrides**
- GS nitrogen compounds
  - . nitrides
  - . . **silicon nitrides**
  - silicon compounds
  - . **silicon nitrides**
  - RT ceramic matrix composites
  - nanocomposites
  - reaction bonding
  - sialon
- silicon oxides**
- GS chalcogenides
  - . oxides
  - . . **silicon oxides**
  - . . . muscovite
  - . . . nephelite
  - . . . silicon dioxide
  - . . . . quartz
  - . . . . . coesite
  - . . . . . stishovite
  - . . . spodumene
  - silicon compounds
  - . **silicon oxides**
  - . . muscovite
  - . . nephelite
  - . . silicon dioxide
  - . . . quartz
  - . . . . coesite
  - . . . . . stishovite
  - . . spodumene
  - RT akermanite
- silicon polymers**
- GS **silicon polymers**
  - . silicone resins
  - . silicones
  - . . polysiloxanes
  - . . siloxanes
  - . . . methyl polysiloxanes
  - . . polysilanes
  - . . polycarbosilanes
  - RT ∞ polymers
- silicon radiation detectors**
- GS measuring instruments
  - . radiation measuring instruments
  - . . radiation detectors
  - . . . **silicon radiation detectors**
  - RT ∞ radiation
- silicon rectifiers*
- USE **crystal rectifiers**
- silicon solar cells*
- USE **solar cells**
- silicon tetrachloride**
- GS halogen compounds
  - . chlorine compounds
  - . . chlorides
  - . . . **silicon tetrachloride**
  - . . . halides
  - . . . chlorides
  - . . . . **silicon tetrachloride**
  - silicon compounds
- . **silicon tetrachloride**
- silicon transistors**
- GS electronic equipment
  - . solid state devices
  - . . semiconductor devices
  - . . . transistors
  - . . . . **silicon transistors**
  - . . . . . SOS (semiconductors)
  - RT SOI (semiconductors)
- silicone resins**
- GS resins
  - . **silicone resins**
  - silicon polymers
  - . **silicone resins**
  - RT thermosetting resins
- silicone rubber**
- GS elastomers
  - . rubber
  - . . synthetic rubbers
  - . . . **silicone rubber**
  - . . . . RTV-40 rubber (trademark)
  - . . . . RTV-60 rubber (trademark)
- silicones**
- GS silicon polymers
  - . **silicones**
  - . . polysiloxanes
  - . . siloxanes
  - . . . methyl polysiloxanes
  - RT ∞ polymers
  - silicon compounds
- siliconizing**
- GS hardening (materials)
  - . **siliconizing**
  - RT coating
  - coatings
  - corrosion prevention
  - corrosion resistance
  - oxidation resistance
  - passivity
- silicon-on-insulator semiconductors*
- USE **SOI (semiconductors)**
- silicon-on-sapphire junctions*
- USE **SOS (semiconductors)**
- silicon-on-sapphire semiconductors*
- USE **SOS (semiconductors)**
- silicon-on-sapphire transistors*
- USE **SOS (semiconductors)**
- silk**
- GS fabrics
  - . **silk**
  - fibers
  - . **silk**
  - RT crepe
  - organic materials
- silkworms**
- GS animals
  - . invertebrates
  - . . arthropods
  - . . . insects
  - . . . . moths
  - . . . . . **silkworms**
  - larvae
  - . **silkworms**
  - RT infestation
- silos (missile storage)*
- USE **missile silos**
- siloxanes**
- GS silicon polymers
  - . silicones
  - . . **siloxanes**
  - RT ∞ polymers
  - polysiloxanes



# silver

silicon compounds

*silts*

USE **sediments**

**silver**

GS chemical elements  
. **silver**  
. . silver isotopes  
metals  
. noble metals  
. . **silver**  
. . . silver isotopes  
. transition metals  
. . **silver**  
. . . silver isotopes

**silver alloys**

GS alloys  
. **silver alloys**  
RT bearing alloys  
gold alloys

**silver bromides**

GS halogen compounds  
. bromine compounds  
. . bromides  
. . . **silver bromides**  
. halides  
. . bromides  
. . . **silver bromides**  
. . metal halides  
. . . silver halides  
. . . . **silver bromides**  
silver compounds  
. silver halides  
. . **silver bromides**

**silver cadmium batteries**

UF *cadmium silver batteries*  
GS electrochemical cells  
. electric batteries  
. . storage batteries  
. . . **silver cadmium batteries**  
RT nickel cadmium batteries

**silver chlorides**

GS halogen compounds  
. chlorine compounds  
. . chlorides  
. . . **silver chlorides**  
. halides  
. . chlorides  
. . . **silver chlorides**  
. . metal halides  
. . . silver halides  
. . . . **silver chlorides**  
silver compounds  
. silver halides  
. . **silver chlorides**

**silver compounds**

GS **silver compounds**  
. silver halides  
. . silver bromides  
. . silver chlorides  
. . silver iodides  
. silver nitrates  
. silver oxides  
RT ∞ chemical compounds  
∞ Group 1B compounds  
∞ metal compounds

**silver halides**

GS halogen compounds  
. halides  
. . metal halides  
. . . **silver halides**  
. . . . silver bromides  
. . . . silver chlorides  
. . . . silver iodides  
silver compounds  
. **silver halides**  
. . silver bromides  
. . silver chlorides  
. . silver iodides

**silver hydrogen batteries**

DEF Secondary batteries having silver and

hydrogen electrodes. They have good energy density and cycle life.

GS electrochemical cells  
. electric batteries  
. . storage batteries  
. . . **silver hydrogen batteries**

**silver iodides**

GS halogen compounds  
. halides  
. . metal halides  
. . . silver halides  
. . . . **silver iodides**  
. iodine compounds  
. . iodides  
. . . **silver iodides**  
silver compounds  
. silver halides  
. . **silver iodides**

**silver isotopes**

GS chemical elements  
. nuclides  
. . isotopes  
. . . **silver isotopes**  
. silver  
. . **silver isotopes**  
metals  
. noble metals  
. . silver  
. . . **silver isotopes**  
. transition metals  
. . silver  
. . . **silver isotopes**

**silver nitrates**

GS nitrogen compounds  
. nitrates  
. . inorganic nitrates  
. . . **silver nitrates**  
silver compounds  
. **silver nitrates**

*silver oxide zinc batteries*

USE **silver zinc batteries**

**silver oxides**

GS chalcogenides  
. oxides  
. . metal oxides  
. . . **silver oxides**  
silver compounds  
. **silver oxides**

**silver zinc batteries**

UF *silver oxide zinc batteries*  
*zinc silver batteries*  
*zinc silver oxide batteries*  
GS electrochemical cells  
. electric batteries  
. . storage batteries  
. . . **silver zinc batteries**

**silviculture**

DEF The theory and practice of controlling the establishment, composition, and growth of stands of trees for the harvesting of foliage limbs, and possibly the trees themselves for biomass.

GS agriculture  
. **silviculture**  
RT biomass  
botany  
cultivation  
forests  
orchards  
planting  
trees (plants)

**SIM**

UF *scientific instrument modules*  
GS modules  
. spacecraft modules  
. . **SIM**  
spacecraft components  
. spacecraft modules  
. . **SIM**  
RT Apollo 15 flight  
Apollo project  
cameras

instrument packages  
∞ instruments

**SIMD (computers)**

DEF A type of parallel computer with multiple memories and an arithmetic logic unit for each memory. A single control unit allocates instruction execution according to the memory that holds the required operands. Used for single instruction multiple datastream.

UF *single instruction multiple datastream*  
GS data processing equipment  
. computers  
. . digital computers  
. . . parallel computers  
. . . . **SIMD (computers)**  
RT architecture (computers)  
computer design  
computer programming  
concurrent processing  
interprocessor communication  
MIMD (computers)  
operating systems (computers)  
parallel processing (computers)

*SIMICOR (image correlator)*

USE **image correlators**

*similarities*

USE **analogies**

**similarity numbers**

GS dimensionless numbers  
. **similarity numbers**  
ratios  
. **similarity numbers**  
RT dimensional analysis  
scaling laws

**similarity theorem**

GS theorems  
. **similarity theorem**  
. . Lagrange similarity hypothesis  
RT dynamic models  
mathematical models  
scale models

**similitude law**

GS laws  
. **similitude law**  
RT gravitation  
inertia  
scale models  
viscosity

**simple harmonic motion**

DEF A motion such that the displacement is a sinusoidal function of time.

GS harmonic motion  
. **simple harmonic motion**  
harmonics  
. **simple harmonic motion**  
RT acoustics  
Fourier analysis  
harmonic excitation

**simplex method**

DEF A finite iterative algorithm used in linear programming whereby successive solutions are obtained and tested for optimality.

GS mathematical logic  
. algorithms  
. . **simplex method**  
optimization  
. **simplex method**  
RT linear programming  
mathematical programming  
matrices (mathematics)  
∞ methodology  
problem solving

**simplification**

RT assumptions

- linearization
- SIMS (spectrometry)*
  - USE **secondary ion mass spectrometry**
- simulated altitude*
  - USE **altitude simulation**
- simulated annealing**
  - (added December 1992)
  - RT annealing
    - computerized simulation
    - laser annealing
    - optimization
    - pulse heating
    - simulation
- simulation**
  - GS **simulation**
    - . atmospheric entry simulation
    - . computerized simulation
    - . . . analog simulation
    - . . . digital simulation
    - . . . distributed interactive simulation
    - . control simulation
    - . data simulation
    - . environment simulation
      - . . . acoustic simulation
      - . . . altitude simulation
      - . . . space environment simulation
      - . . . thermal simulation
      - . . . weightlessness simulation
      - . . . . neutral buoyancy simulation
    - . exhaust flow simulation
    - . flight simulation
    - . . in-flight simulation
    - . landing simulation
    - . motion simulation
    - . rheoelectrical simulation
    - . solar simulation
    - . systems simulation
      - . . . computer systems simulation
    - . direct numerical simulation
    - . hardware-in-the-loop simulation
    - . large eddy simulation
    - . magnetohydrodynamic simulation
    - . scene generation
  - RT analogies
    - bionics
    - bond graphs
    - data processing equipment
    - deception
    - Earth analogs
    - game theory
    - heuristic methods
    - hypervelocity projectiles
    - mathematical models
    - Monte Carlo method
    - operations research
    - simulated annealing
    - simulators
      - spacecraft cabin simulators
      - systems analysis
      - validity
      - virtual reality
      - war games
- simulator training*
  - USE **training simulators**
- simulators**
  - GS **simulators**
    - . environment simulators
    - . . . Lunar Gravity Simulator
    - . . . solar simulators
    - . . . space simulators
    - . . . . clinostats
    - . . . High Vacuum Orbital Simulator
    - . . . Langley complex coordinator
    - . lunar orbit and landing simulators
    - . motion simulators
    - . shock simulators
    - . Shuttle Engineering Simulator
    - . Shuttle Mission Simulator
    - . target simulators
    - . training simulators
    - . . . flight simulators
    - . . . cockpit simulators
    - . . . spacecraft cabin simulators
    - . vibration simulators
- . . . vertical motion simulators
- RT analogs
  - computer systems simulation
  - dummies
  - ∞ missile simulators
    - models
    - simulation
  - ∞ test equipment
    - test facilities
    - training devices
- simultaneous equations**
  - RT ∞ equations
    - least squares method
    - matrices (mathematics)
- simultaneous image correlator*
  - USE **image correlators**
- sine series**
  - GS analysis (mathematics)
    - . calculus
    - . . series (mathematics)
      - . . . **sine series**
      - . . . real variables
      - . . . periodic functions
      - . . . trigonometric functions
        - . . . . **sine series**
        - . . . series (mathematics)
          - . . . . **sine series**
          - . . . functions (mathematics)
            - . transcendental functions
            - . . . periodic functions
            - . . . trigonometric functions
              - . . . . **sine series**
- sine waves**
  - DEF Waves which can be expressed as the sine of a linear function of time, or space, or both. Used for sinusoids.
  - UF *sinusoids*
  - RT elastic waves
    - electromagnetic radiation
    - trigonometric functions
    - wavelet analysis
  - ∞ waves
- Singapore**
  - GS nations
    - . **Singapore**
  - RT Asia
- single channel per carrier transmission**
  - DEF Voice and data transmission system for satellite communication featuring the use of a carrier frequency for each channel of communication. Used for SCPC transmission.
  - UF *SCPC transmission*
  - GS telecommunication
    - . **single channel per carrier transmission**
      - transmission
        - . signal transmission
        - . . data transmission
        - . . . **single channel per carrier transmission**
  - RT carrier frequencies
    - channels (data transmission)
      - satellite communication
      - satellite transmission
      - spacecraft communication
      - telegraph systems
      - telemetry
      - telephony
      - voice communication
      - voice data processing
- single crystals**
  - UF *monocrystals*
  - GS crystals
    - . **single crystals**
  - RT bicrystals
    - boules
    - Bravais crystals
    - Bridgman method
    - crystal lattices
    - diamonds
    - graphite
    - kink bands
    - needles
- piezoelectric crystals
- polycrystals
- space processing
- ultrapure metals
- single electron transistors**
  - (added July 2008)
  - DEF Three-terminal, solid-state, nanoelectronic switching devices that use quantum mechanical electron tunneling to control the movement of single electrons and amplify current.
  - GS electronic equipment
    - . solid state devices
    - . . . semiconductor devices
    - . . . . transistors
    - . . . . . **single electron transistors**
      - nanostructures (devices)
      - . **single electron transistors**
  - RT carbon nanotubes
    - electron mobility
    - electron tunneling
    - nanotechnology
    - quantum dots
    - tunnel junctions
- single engine aircraft**
  - GS **single engine aircraft**
    - . Cessna 172 aircraft
    - . Cessna 205 aircraft
    - . Cessna 210 aircraft
    - . F-8 aircraft
    - . F-9 aircraft
    - . F-16 aircraft
    - . F-84 aircraft
    - . F-86 aircraft
    - . F-94 aircraft
    - . F-100 aircraft
    - . F-101 aircraft
    - . F-102 aircraft
    - . F-104 aircraft
    - . F-105 aircraft
    - . F-106 aircraft
    - . Jaguar aircraft
    - . jet provost aircraft
    - . L-29 jet trainer
    - . MiG aircraft
    - . Mirage aircraft
    - . . . Mirage 3 aircraft
    - . P-51 aircraft
    - . P-1127 aircraft
    - . P-1154 aircraft
    - . T-2 aircraft
    - . T-28 aircraft
    - . T-33 aircraft
    - . Vampire MK 35 aircraft
    - . VJ-101 aircraft
  - RT ∞ aircraft
    - fighter aircraft
    - general aviation aircraft
- single event upsets**
  - DEF Radiation-induced errors in microelectronic circuits caused when charged particles (usually from the radiation belts or from cosmic rays) lose energy by ionizing the medium through which they pass, leaving behind a wake of electron-hole pairs.
  - GS radiation effects
    - . **single event upsets**
  - RT
    - astrionics
    - avionics
    - charged particles
    - cosmic rays
    - electron-hole drops
    - inner radiation belt
    - ionization
    - microelectronics
    - radiation damage
    - radiation dosage
    - satellite-borne instruments
    - secondary cosmic rays
    - spacecraft charging

## single sideband transmission

spacecraft electronic equipment

*single input single output systems*  
USE **SISO (control systems)**

*single instruction multiple datastream*  
USE **SIMD (computers)**

*single sideband modulation*  
USE **single sideband transmission**

**single sideband transmission**  
UF *single sideband modulation*  
GS transmission  
. electromagnetic wave transmission  
. . . radio transmission  
. . . **single sideband transmission**  
. signal transmission  
. . . radio transmission  
. . . **single sideband transmission**  
RT amplitude modulation  
double sideband transmission  
sidebands  
television transmission  
voice communication  
wave propagation

**single stage rocket vehicles**  
GS rocket vehicles  
. **single stage rocket vehicles**  
. . . Agena rocket vehicles  
. . . . Agena A rocket vehicle  
. . . . Agena B rocket vehicle  
. . . . Agena C rocket vehicle  
. . . . Agena D rocket vehicle  
. . . Arcas rocket vehicles  
. . . Black Brant sounding rockets  
. . . . Black Brant 1 sounding rocket  
. . . . Black Brant 2 sounding rocket  
. . . . Black Brant 3 sounding rocket  
. . . . Black Brant 4 sounding rocket  
. . . . Black Brant 5 sounding rocket  
. . . Black Knight rocket vehicle  
. . . Dornier paraglider rocket vehicle  
. . . Genie rocket vehicle  
. . . Honest John rocket vehicle  
. . . Hyla-Star rocket vehicle  
. . . Little John rocket vehicle  
. . . Loki rocket vehicle  
. . . Nomad launch vehicle  
. . . Veronique rocket vehicles  
. . . Viking rocket vehicle  
. . . Zuni rocket vehicle  
RT Mauler missile  
rocket engines  
∞ vehicles

**single stage to orbit vehicles**  
DEF Second and third generation (post-Space Shuttle) vehicles studied for Earth orbit international space transportation system.  
GS launch vehicles  
. reusable launch vehicles  
. . . **single stage to orbit vehicles**  
. . . . Delta Clipper  
. . . . HOTOL launch vehicle  
reentry vehicles  
. recoverable spacecraft  
. . reusable spacecraft  
. . . **single stage to orbit vehicles**  
. . . . Delta Clipper  
. . . . HOTOL launch vehicle  
RT NASA programs  
rocket-based combined-cycle engines  
space shuttles  
space transportation  
∞ vehicles  
X-30 vehicle

**single-phase flow**  
UF *one-phase flow*  
*uniphase flow*  
GS fluid flow  
. **single-phase flow**  
RT critical flow  
gas flow  
laminar flow  
liquid flow  
mass flow  
multiphase flow

orifice flow  
pipe flow  
steady flow  
steam flow  
subcritical flow  
supercritical flow  
turbulent flow  
two phase flow  
uniform flow  
unsteady flow

**singular integral equations**  
GS analysis (mathematics)  
. functional analysis  
. . . integral equations  
. . . **singular integral equations**  
RT ∞ equations

**singularity (mathematics)**  
GS analysis (mathematics)  
. complex variables  
. . **singularity (mathematics)**  
. . . naked singularities  
RT points (mathematics)  
uniqueness

**sinkholes**  
DEF Circular depressions in a Karst area. Their drainage is subterraneous, their size is measured in meters or tens of meters, and they are commonly funnel shaped.  
GS landforms  
. structural basins  
. . karst  
. . . **sinkholes**  
RT kettles (geology)  
structural properties (geology)

**sinking**  
RT falling  
refraction  
submerging  
water immersion

**sinks**  
SN (EXCLUDES PLUMBING FIXTURES--LIMITED TO AREAS FOR ABSORPTIVE DISPOSAL OF HEAT OR FLUIDS)  
GS **sinks**  
. heat sinks  
RT absorbers (materials)  
disposal  
∞ sources

*sinks (geology)*  
USE **structural basins**

**Sinope**  
(added January 1996)  
DEF A natural satellite of Jupiter orbiting at a mean distance of 23,700,000 kilometers.  
GS celestial bodies  
. natural satellites  
. . Jupiter satellites  
. . . **Sinope**  
RT Jupiter (planet)

**sintered aluminum powder**  
GS particles  
. metal particles  
. . metal powder  
. . . powdered aluminum  
. . . . **sintered aluminum powder**  
. . . powder (particles)  
. . . metal powder  
. . . powdered aluminum  
. . . . **sintered aluminum powder**  
RT aluminum  
powder metallurgy

**sintering**  
DEF The bonding of adjacent surfaces of particles in a mass of powders, usually metal, by heating. Used for presintering.  
UF *presintering*  
GS **sintering**  
. liquid phase sintering  
RT agglomeration  
combustion synthesis  
furnaces

growth  
heating  
hot isostatic pressing  
hot pressing  
metal powder  
mixed crystals  
porosity  
powder metallurgy  
pyrometallurgy  
reaction bonding  
roasting  
shrinkage  
sialon

**sinuses**  
DEF A term used in anatomical nomenclature to designate a cavity or hollow space.  
GS **sinuses**  
. paranasal sinuses  
RT carotid sinus body  
carotid sinus reflex  
nose (anatomy)  
respiration

*sinusoids*  
USE **sine waves**

*Sioux helicopter*  
USE **OH-13 helicopter**

**siphoning**  
DEF The transfer of a liquid from a high to a lower level by atmospheric pressure forcing it up the shorter leg while the weight of the liquid in the longer leg causes continuous downward flow.  
RT ∞ fluids  
siphons  
thermosiphons

**siphons**  
RT materials handling  
pipelines  
pipes (tubes)  
pumps  
siphoning  
∞ tubes

*SIR-A*  
USE **Shuttle Imaging Radar**

*SIR-B*  
USE **Shuttle Imaging Radar**

*SIR-C*  
USE **Shuttle Imaging Radar**

*SIR-D*  
USE **Shuttle Imaging Radar**

**sirens**  
RT horns  
noise intensity  
signal generators  
∞ signals  
sound generators  
sound intensity  
sound transmission  
warning systems

**SIRIO satellite**  
GS artificial satellites  
. synchronous satellites  
. . **SIRIO satellite**  
RT Italian space program  
Italy

**SIRS B satellite**  
GS artificial satellites  
. meteorological satellites  
. . **SIRS B satellite**  
RT meteorological flight  
meteorological instruments  
satellite observation  
unmanned spacecraft

*SIRTF*  
USE **Space Infrared Telescope Facility**

**SIS (semiconductors)**  
DEF Semiconductor devices consisting of

an electrically insulating layer sandwiched between two semiconducting materials. Used for semiconductor insulator semiconductors.

- UF *semiconductor insulator semiconductors*
- GS electronic equipment
  - . solid state devices
  - . . **SIS (semiconductors)**
- RT barrier layers
  - MIM (semiconductors)
  - MIS (semiconductors)
  - MSM (semiconductors)
  - photodiodes
  - photovoltaic cells
  - p-n junctions
  - Schottky diodes
  - semiconductor diodes
  - semiconductor junctions
  - silicon junctions
  - SOI (semiconductors)
  - solar cells
  - SOS (semiconductors)
  - tin oxides
  - transistors

### SIS (superconductors)

- (added March 1989)
- UF *superconductor insulator superconductors*
- GS electronic equipment
  - . solid state devices
  - . . **SIS (superconductors)**
  - superconducting devices
  - . **SIS (superconductors)**
- RT high temperature superconductors
  - Josephson effect
  - Josephson junctions
  - squid (detectors)

### SISO (control systems)

- (added October 1988)
- UF *single input single output systems*
- RT ∞ control
  - control stability
  - control systems design
  - control theory
  - feedback control
- ∞ systems
  - systems stability

### site data processors

- UF *SDP (computers)*
- GS data processing equipment
  - . computers
  - . . **site data processors**
- RT Apollo project
  - ∞ data
  - data links
  - data processing

### site selection

DEF Selecting the location for any physical plant (nuclear power, solar house, etc.) while considering the environmental impact, safety, etc.

- GS selection
  - . **site selection**
- RT airports
  - certification
- ∞ facilities
  - industrial areas
  - land use
  - leasing
  - logistics
  - Mars landing sites
  - options
  - resources
  - roads
  - routes
  - services
  - sites
  - terminal facilities
  - transportation
  - utilities

### sites

- UF *tracts*
- GS **sites**
  - . Central Atlantic Regional Ecol Test Site

- . landing sites
    - . . lunar landing sites
    - . . Mars landing sites
  - . launching sites
    - . . launching pads
  - . offshore reactor sites
- RT airport planning  
barren land
- ∞ facilities  
land
- ∞ plots  
position (location)  
regions  
rural land use  
site selection

### sitting position

- RT prone position
- rest
- seats
- supine position

### situational awareness

- (added October 2001)
- DEF The degree and accuracy to which a human or robotic agent perceives the operating environment.
- RT accident prevention
  - air traffic control
  - alertness
  - decision support systems
  - display devices
  - flight management systems
  - human factors engineering
  - operator performance
  - perception
  - pilot performance
  - pilot support systems
  - reconnaissance
  - runway incursions
  - surveillance
  - threat evaluation

### size (dimensions)

- GS **size (dimensions)**
  - . grain size
- RT fineness

### size determination

- GS **size determination**
  - . precipitation particle measurement
- RT body measurement (biology)
  - classifiers
  - dimensional measurement
- ∞ measurement
  - particle size distribution
- ∞ sizing

### size distribution

DEF The study of the size of objects or features and their distribution.

- GS **size distribution**
  - . particle size distribution
- RT drop size
  - mass distribution
  - statistical distributions

### size separation

- UF *sizing (separation)*
- RT beneficiation
  - classifiers
- ∞ classifying
  - concentrators
  - filtration
  - flotation
  - metal powder
  - particle size distribution
  - powder (particles)
- ∞ separation
  - settling
- ∞ sizing

### ∞ sizing

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT body measurement (biology)
  - size determination
  - size separation
  - sizing (shaping)
  - sizing (surface treatment)

sizing materials

### sizing (separation)

USE **size separation**

### sizing (shaping)

- GS metal working
  - . **sizing (shaping)**
- RT coining
  - pressing (forming)
- ∞ sizing

### sizing (surface treatment)

- SN (EXCLUDES MECHANICAL SHAPING OR REMOVAL OF SURFACE MATERIALS)
- RT finishes
  - ∞ sizing
  - sizing materials
- ∞ surfaces

### sizing materials

- SN (MATERIALS USED FOR SURFACE TREATMENT)
- RT binders (materials)
  - clays
  - fillers
  - glues
- ∞ materials
- ∞ sizing
  - sizing (surface treatment)
- starches

### sizing screens

- GS separators
  - . classifiers
  - . . **sizing screens**
- RT agitation
  - concentrators
  - fluid filters
- ∞ screens
  - shakers
  - sieves

### skeletal muscle

(added August 2004)

DEF Striated muscles having fibers connected at either or both extremities with the bony framework of the body. These are found in appendicular and axial muscles.

- UF *striated muscle voluntary muscle*
- GS anatomy
  - . musculoskeletal system
  - . . muscles
  - . . . **skeletal muscle**
- RT muscle fibers
  - muscular strength
  - smooth muscle
  - striation

### skeletal myocytes

(added December 2004)

USE **muscle fibers**

### skeleton

USE **musculoskeletal system**

### skewness

- RT asymmetry
  - deformation
  - displacement
  - distortion
  - distribution moments
  - eccentricity
  - moments

### skid landings

- RT air cushion landing systems
  - crash landing
  - hydroplaning
  - skidding

### skidding

- RT hydroplaning
  - landing gear
  - sideslip
  - skid landings
  - sleds

## skin (anatomy)

yaw

*skills*  
USE **abilities**

**skin (anatomy)**  
GS anatomy  
. **skin (anatomy)**  
. . . epidermis  
RT albinism  
∞ blisters  
carotene  
chlorophylls  
collagens  
contact dermatitis  
cytochromes  
dermatitis  
dermatology  
epithelium  
evaporation  
hair  
homeostasis  
leather  
melanin  
membranes  
perspiration  
petechia  
pigments  
secretions  
sense organs  
thermoreceptors  
touch

**skin (structural member)**  
GS membranes  
. membrane structures  
. . **skin (structural member)**  
structural members  
. membrane structures  
. . **skin (structural member)**  
RT aircraft construction materials  
∞ construction materials  
hulls (structures)  
metal shells  
shells (structural forms)  
stressed-skin structures  
thin walled shells  
thin walls  
toroidal shells  
webs (supports)

**skin friction**  
UF *friction pressure drop*  
GS friction  
. **skin friction**  
. . friction drag  
. . . aerodynamic drag  
. . . . supersonic drag  
. . . viscous drag  
RT aerodynamic heating  
drag  
drag devices  
flow resistance  
fluid flow  
friction factor  
riblets  
streamlining

**skin grafts**  
RT surgery  
therapy

**skin resistance**  
GS electrical properties  
. electrical impedance  
. . electrical resistance  
. . . **skin resistance**  
impedance  
. electrical impedance  
. . electrical resistance  
. . . **skin resistance**  
RT ∞ resistance

**skin temperature (biology)**  
GS temperature  
. **skin temperature (biology)**  
RT ∞ biology  
fever  
hyperthermia

hypothermia

**skin temperature (non-biological)**  
GS surface properties  
. surface temperature  
. . **skin temperature (non-biological)**  
temperature  
. surface temperature  
. . **skin temperature (non-biological)**  
RT aerodynamic heating  
aerothermodynamics

**Skinner boxes**  
RT behavior  
psychological tests  
psychometrics

**skirts**  
RT afterbodies  
boattails  
conical nozzles  
exhaust nozzles  
foundations  
∞ jet nozzles  
rocket nozzles

**skis**  
RT hydrofoils  
hydroplanes (surfaces)  
landing gear

**Skua rocket vehicles**  
GS rocket vehicles  
. sounding rockets  
. . **Skua rocket vehicles**  
RT solid propellant rocket engines  
∞ vehicles

**skull**  
GS anatomy  
. head (anatomy)  
. . **skull**  
. . . cranium  
. . . . intracranial cavity  
. . . mastoids  
. musculoskeletal system  
. . bones  
. . . **skull**  
. . . . cranium  
. . . . . intracranial cavity  
. . . . . mastoids  
RT forehead  
intercranial circulation

**sky**  
GS **sky**  
. night sky  
RT cloud cover  
clouds (meteorology)  
dayglow  
Rayleigh scattering  
sunlight

**sky brightness**  
GS electromagnetic properties  
. optical properties  
. . brightness  
. . . **sky brightness**  
RT airglow  
auroras  
cloud cover  
daytime  
gegenschein  
glare  
light (visible radiation)  
light emission  
luminance  
night  
night sky  
nightglow  
solar radiation  
sunlight  
zodiacal light

**sky radiation**  
GS atmospheric radiation  
. **sky radiation**  
. . airglow

. . . geocoronal emissions  
. . . nightglow  
. . . twilight glow  
. . dayglow  
. . elves  
. . sprites (atmospheric physics)  
electromagnetic radiation  
. light (visible radiation)  
. . **sky radiation**  
. . . airglow  
. . . . geocoronal emissions  
. . . . nightglow  
. . . . twilight glow  
. . . dayglow  
. . . elves  
. . . sprites (atmospheric physics)  
RT background radiation  
pyranometers  
∞ radiation  
stratosphere radiation  
sunlight  
thermal radiation  
tropospheric radiation

**sky surveys (astronomy)**  
GS observation  
. **sky surveys (astronomy)**  
surveys  
. **sky surveys (astronomy)**  
RT asteroid detection  
astronomical catalogs  
astronomy  
indexes (documentation)  
northern sky  
Southern sky  
Wide-field Infrared Survey Explorer

**sky waves**  
DEF In radio, radio energy that is received after having been reflected by the ionosphere.  
GS electromagnetic radiation  
. radio waves  
. . **sky waves**  
. . . whistlers  
RT ground wave propagation  
ionospheric noise

**Skybolt missile**  
GS missiles  
. ballistic missiles  
. . **Skybolt missile**  
RT solid propellant rocket engines

*Skycrane helicopter*  
USE **CH-54 helicopter**

**Skydrol (trademark)**  
GS liquids  
. hydraulic fluids  
. . **Skydrol (trademark)**  
RT esters  
phosphates  
plasticizers

*Skyhawk aircraft*  
USE **A-4 aircraft**

**skyhook balloons**  
DEF Large free balloons having plastic envelopes, used especially for constant level meteorological observations at very high altitudes. (Originally a code name for a U.S. Navy project.)  
GS expandable structures  
. inflatable structures  
. . balloons  
. . . high altitude balloons  
. . . . **skyhook balloons**  
RT high altitude  
meteorological balloons  
ROBIN balloons  
rockoons

**Skylab 1**  
UF *SKYLAB space station (unmanned)*  
SL 1  
GS artificial satellites  
. orbital workshops  
. . **Skylab 1**  
. . space stations  
. . **Skylab 1**

- laboratories
  - . space laboratories
  - . . manned orbital laboratories
  - . . . **Skylab 1**
- manned spacecraft
  - . manned orbital laboratories
  - . . **Skylab 1**
  - . orbital workshops
  - . . **Skylab 1**
- stations
  - . space stations
  - . . **Skylab 1**
- RT airlock modules
  - command service modules
  - EREP
  - multiple docking adapters
  - space missions
- Skylab 2**
  - UF *SL 2*
  - GS artificial satellites
    - . orbital workshops
    - . . **Skylab 2**
    - . space stations
    - . . **Skylab 2**
  - laboratories
    - . space laboratories
    - . . manned orbital laboratories
    - . . . **Skylab 2**
  - manned spacecraft
    - . manned orbital laboratories
    - . . **Skylab 2**
    - . orbital workshops
    - . . **Skylab 2**
  - stations
    - . space stations
    - . . **Skylab 2**
  - RT airlock modules
    - command service modules
    - EREP
    - multiple docking adapters
    - Saturn 1B launch vehicles
    - Saturn 5 launch vehicles
    - space missions
- Skylab 3**
  - UF *SL 3*
  - GS artificial satellites
    - . orbital workshops
    - . . **Skylab 3**
    - . space stations
    - . . **Skylab 3**
  - laboratories
    - . space laboratories
    - . . manned orbital laboratories
    - . . . **Skylab 3**
  - manned spacecraft
    - . manned orbital laboratories
    - . . **Skylab 3**
    - . orbital workshops
    - . . **Skylab 3**
  - stations
    - . space stations
    - . . **Skylab 3**
  - RT airlock modules
    - command service modules
    - EREP
    - multiple docking adapters
    - Saturn 1B launch vehicles
    - Saturn 5 launch vehicles
    - space missions
- Skylab 4**
  - UF *SL 4*
  - GS artificial satellites
    - . orbital workshops
    - . . **Skylab 4**
    - . space stations
    - . . **Skylab 4**
  - laboratories
    - . space laboratories
    - . . manned orbital laboratories
    - . . . **Skylab 4**
  - manned spacecraft
    - . manned orbital laboratories
    - . . **Skylab 4**
    - . orbital workshops
    - . . **Skylab 4**
  - stations
    - . space stations
- . . **Skylab 4**
- RT airlock modules
  - command service modules
  - EREP
  - multiple docking adapters
  - Saturn 1B launch vehicles
  - Saturn 5 launch vehicles
  - space missions
- Skylab program**
  - GS programs
    - . NASA programs
    - . . NASA space programs
    - . . . **Skylab program**
    - . space programs
    - . . NASA space programs
    - . . . **Skylab program**
  - RT AAP 1 mission
    - AAP 2 mission
    - AAP 3 mission
    - AAP 4 mission
    - airlock modules
    - Apollo applications program
    - Apollo flights
    - Apollo project
    - Apollo spacecraft
    - Apollo telescope mount
    - Earth Resources Information System
    - Earth Resources Program
    - Earth Resources Survey Program
    - orbital workshops
    - Saturn 1 workshop
    - Saturn 5 workshop
    - Saturn workshops
    - Spacelab
- SKYLAB space station (unmanned)*
- USE **Skylab 1**
- Skylark*
- USE **Skylark rocket vehicle**
- Skylark rocket vehicle**
  - UF *Skylark*
  - GS rocket vehicles
    - . multistage rocket vehicles
    - . . **Skylark rocket vehicle**
    - . sounding rockets
    - . . **Skylark rocket vehicle**
  - RT solid propellant rocket engines
- Skymaster aircraft*
- USE **C-54 aircraft**
- Skynet satellites**
  - GS artificial satellites
    - . **Skynet satellites**
  - RT communication satellites
    - satellite networks
    - UK satellites
- Skyraider aircraft*
- USE **A-1 aircraft**
- Skyrocket aircraft*
- USE **D-558 aircraft**
- Skystreak aircraft*
- USE **D-558 aircraft**
- Skyvan aircraft*
- USE **SC-7 aircraft**
- Skywarrior aircraft*
- USE **A-3 aircraft**
- SL 1*
- USE **Skylab 1**
- SL 2*
- USE **Skylab 2**
- SL 3*
- USE **Skylab 3**
- SL 4*
- USE **Skylab 4**
- SL-3 rocket engine**
  - GS engines
    - . rocket engines
- . . solid propellant rocket engines
- . . . **SL-3 rocket engine**
- slabs**
  - RT billets
    - blocks
    - flat plates
    - metal plates
    - plates (structural members)
  - ∞ platforms
  - structural members
- slags**
  - RT aggregates
    - reaction products
    - wastes
- SLAM*
- USE **supersonic low altitude missile**
- slamming**
  - RT fluid dynamics
- slant*
- USE **slopes**
- slant perception*
- USE **space perception**
- slashes*
- USE **clearings (openings)**
- Slater orbitals**
  - GS orbitals
    - . **Slater orbitals**
  - RT Hartree-Fock-Slater method
- sleds**
  - GS surface vehicles
    - . **sleds**
    - . . rocket propelled sleds
  - RT dollies
    - skidding
    - towed bodies
    - tractors
    - trailers
- sleep**
  - UF *drowsiness*
  - GS **sleep**
    - . hypersomnia
    - . hypnosis
    - . insomnia
  - RT dreams
    - ∞ drives
    - melatonin
    - rapid eye movement state
    - rest
- sleep deprivation**
  - GS deprivation
    - . **sleep deprivation**
  - RT consciousness
    - fatigue (biology)
    - insomnia
    - wakefulness
- sleeves**
  - SN (EXCLUDES CLOTHING)
  - RT connectors
    - couplings
    - fasteners
    - fittings
    - joints (junctions)
- slender bodies**
  - GS **slender bodies**
    - . slender cones
  - RT aerodynamic configurations
    - aerodynamics
    - axisymmetric bodies
  - ∞ bodies
    - ducted bodies
    - fineness ratio
    - missile bodies
    - power law bodies
  - ∞ sharpness
    - streamlined bodies
    - symmetrical bodies

## slender cones

∞ thin bodies

### slender cones

- GS cones
  - . conical bodies
  - . . **slender cones**
- slender bodies
  - . **slender cones**
  - . symmetrical bodies
  - . bodies of revolution
  - . . conical bodies
  - . . . **slender cones**
- RT aerodynamic configurations
  - . axisymmetric bodies

### slender wings

- UF *high aspect ratio wings*
- GS airfoils
  - . wings
  - . . **slender wings**
  - . . . infinite span wings
- RT fixed wings
  - . wing planforms
  - . wing rock

### slenderness ratio

- (*added March 2000*)
- USE **aspect ratio**

### slewing

- DEF Of a gyro, the rotation of the spin axis caused by applying torque about the axis of rotation. In radar, changing the scale on the display.
- RT antennas
  - . error signals
  - . positioning devices (machinery)
  - . radar tracking
  - . servomotors
- ∞ spinners

### slicing

- GS cutting
  - . **slicing**
- RT metal cutting
  - . planing
  - . planning
  - . scarfing
- ∞ separation
  - . splitting

### slicks

- USE **oil slicks**

### slides

- USE **chutes**

### slides (microscopy)

- DEF Rectangular pieces of glass on which objects are mounted for microscopic examination.
- RT microscopy

### sliding

- DEF Relative displacement between two bodies along a surface, without loss of contact between the bodies.
- RT interfacial tension
  - . lubrication
  - . mass flow
- ∞ slip
  - . slumping
  - . static friction

### ∞ sliding contact

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT contact loads
  - . electric contacts
  - . sliding friction
  - . vapor phase lubrication

### sliding friction

- GS friction
  - . kinetic friction
  - . . **sliding friction**
- RT coefficient of friction
  - . dry friction
  - . electric contacts
- ∞ sliding contact

- . static friction
- . tribometers
- . wear
- . wear resistance

### ∞ slip

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT plastic deformation
  - . polyslips
  - . sideslip
  - . sliding

### slip bands

- USE **edge dislocations**

### slip casting

- GS forming techniques
  - . casting
  - . . **slip casting**

### slip flow

- SN (LIMITED TO RAREFIED GAS FLOW IN THE REGION BETWEEN KNUDSEN NUMBERS 0. 01 AND 0. 1 ONLY--EXCLUDES TRANSITION FLOW, FREE MOLECULE FLOW CREEP, SHEAR FLOW, AND PLASTIC FLOW)
- DEF Rarefied gas flow in the region between Knudsen numbers 0. 01 and 0. 1.
- GS fluid flow
  - . gas flow
  - . . molecular flow
  - . . . **slip flow**
- RT continuum flow
  - . free molecular flow
  - . low density wind tunnels
  - . rarefied gas dynamics
  - . transition flow

### slipstreams

- GS wakes
  - . aircraft wakes
  - . . **slipstreams**
  - . . . propeller slipstreams
  - . turbulent wakes
  - . . **slipstreams**
  - . . . propeller slipstreams
- RT backwash
  - . Strouhal number
  - . turbulence

### slits

- GS openings
  - . **slits**
- RT apertures
  - . Fresnel reflectors
  - . slots

### slivers

- RT fibers
  - . wood

### slopes

- DEF The inclined surfaces of any part of the Earth's surface, as in hillslopes; also broad parts of a continent descending toward an ocean, as in the Pacific slope. Used for cant, slant, and steepness.
- UF *cant*
  - . *slant*
  - . *steepness*
- GS **slopes**
  - . glide paths
- RT angles (geometry)
  - . cliffs
  - . escarpments
- ∞ grade
  - . gradients
  - . height
- ∞ inclination
  - . landforms
  - . landslides
  - . level (horizontal)
  - . pitch (inclination)
- ∞ profiles
- ∞ rakes
  - . ramp functions
  - . ramps (structures)

topography

### slushing

- USE **liquid slushing**

### slot antennas

- UF *slotted antennas*
- GS antennas
  - . directional antennas
  - . . **slot antennas**
- RT antenna design
  - . horn antennas
  - . microwave antennas
  - . radant
  - . radar antennas
  - . waveguide antennas

### slots

- GS **slots**
  - . wing slots
- RT lift devices
  - . louvers
  - . openings
  - . slits

### slotted antennas

- USE **slot antennas**

### slotted wind tunnels

- GS test facilities
  - . wind tunnels
  - . . **slotted wind tunnels**
- RT supersonic wind tunnels
  - . transonic wind tunnels
  - . trisonic wind tunnels
  - . vents

### Slovakia

- (*added September 1994*)
- GS nations
  - . **Slovakia**
- RT Czech Republic
  - . Czechoslovakia
  - . Europe

### slow neutrons

- USE **thermal neutrons**

### SLR (ranging)

- (*added July 2001*)
- USE **satellite laser ranging**

### sludge

- DEF A water-formed sedimentary deposit.
- GS **sludge**
  - . activated sludge
- RT deposits
  - . liquid wastes
  - . mud
  - . ocean bottom
  - . organic wastes (fuel conversion)
  - . reaction products
  - . sediments
  - . sewage treatment
  - . solid wastes
  - . waste treatment
  - . wastes

### slumping

- RT geomorphology
  - . mass flow
  - . sliding

### slurrries

- GS mixtures
  - . **slurrries**
- RT dispersions
  - . emulsions
  - . gels
  - . rheocasting
  - . slurry propellants
  - . slush hydrogen

### slurry propellants

- GS propellants
  - . rocket propellants
  - . . liquid rocket propellants
  - . . . **slurry propellants**
  - . . . . slush hydrogen
- RT aircraft fuels
  - . colloidal propellants

- dispersions  
gelled rocket propellants  
metal fuels  
metal propellants  
monopropellants  
slurries  
solid rocket propellants
- slush**  
RT bay ice  
cryogenic rocket propellants  
ice  
runway conditions  
snow  
water
- slush hydrogen**  
(added March 1990)  
GS propellants  
. rocket propellants  
. . . liquid rocket propellants  
. . . . slurry propellants  
. . . . **slush hydrogen**  
RT hydrogen fuels  
liquid hydrogen  
slurries
- SLV  
USE **Standard Launch Vehicles**
- SLV (soft landing vehicles)  
USE **soft landing spacecraft**
- SLWT (propellant tank)  
(added June 1998)  
USE **external tanks**  
**propellant tanks**
- SM-65 missile  
USE **Atlas launch vehicles**
- SM-68 missile  
USE **Titan 1 ICBM**
- SM-68B missile  
USE **Titan 2 ICBM**
- SMA (image analysis)  
(added July 2000)  
USE **spectral mixture analysis**
- Small Astronomy Satellite 1  
USE **SAS-1**
- Small Astronomy Satellite 2  
USE **SAS-2**
- Small Astronomy Satellite 3  
USE **SAS-3**
- Small Astronomy Satellites  
USE **SAS**
- small perturbation flow**  
GS fluid flow  
. **small perturbation flow**  
RT flow distortion  
oscillating flow
- small satellite technology**  
(added January 1996)  
UF *Small Satellite Technology Initiative*  
*SSTI*  
GS technologies  
. **small satellite technology**  
RT cost reduction  
microsatellites  
nanosatellites  
remote sensing  
satellite design  
small scientific satellites
- Small Satellite Technology Initiative  
USE **small satellite technology**
- small scientific satellites**  
GS artificial satellites  
. scientific satellites  
. . . **small scientific satellites**  
. . . . Submillimeter Wave Astronomy  
Satellite
- . . . Transition Region and Coronal  
Explorer
- RT microsatellites  
nanosatellites  
small satellite technology
- Small Water Plane Area Twin Hull*  
USE **SWATH (ship)**
- smallpox**  
GS diseases  
. infectious diseases  
. . . viral diseases  
. . . **smallpox**
- smart materials**  
(added March 1998)  
DEF Engineered materials capable of responding to their environment to a significant degree, by virtue of intrinsic properties and/or built-in sensor/actuator elements. Applications of these materials include vibration suppression/isolation, precision positioning, damage detection, and tunable devices.  
UF *intelligent materials*  
GS **smart materials**  
. thermochromic coatings  
RT actuators  
biomimetics  
composite materials  
electrorheological fluids  
electrostriction  
ferroelastic materials  
ferroelasticity  
ferroelectric materials  
ferromagnetic materials  
magnetorheological fluids  
∞ materials  
piezoelectric actuators  
piezoelectric ceramics  
∞ sensors  
shape memory alloys  
smart structures  
vibration damping
- smart structures**  
(added August 1990)  
DEF Structures and/or structural components which contain embedded internal sensors. The sensors serve as lifetime health monitors analogous to a central nervous system, and give information on structural properties, providing real time nondestructive evaluation.  
UF *intelligent structures*  
RT active control  
adaptive control  
biomimetics  
composite structures  
fiber optics  
large space structures  
piezoelectric actuators  
smart materials  
space station structures  
spacecraft structures  
strain measurement  
structural engineering  
structural health monitoring  
structural members  
∞ structures  
systems health monitoring  
tensegrity structures
- smear**  
RT frequency response  
image contrast  
signal fading  
television transmission  
video data
- smectite*  
(added October 2001)  
USE **montmorillonite**
- smell*  
USE **olfactory perception**
- smelting**  
RT melting  
∞ metallurgy  
reduction (chemistry)
- refining
- Smith chart**  
RT electrical impedance  
impedance  
polar coordinates  
reactance  
standing wave ratios  
transmission lines  
wavaguides
- SMM-A  
USE **Solar Maximum Mission-A**
- smog**  
RT air pollution  
air sampling  
carbon monoxide  
combustion products  
environmental chemistry  
exhaust gases  
flames  
fog  
hydrocarbon combustion  
hydrocarbon poisoning  
lead poisoning  
particulates  
smoke
- smoke**  
GS mixtures  
. dispersions  
. . . platisols  
. . . **smoke**  
RT aerosols  
air pollution  
biomass burning  
combustion products  
dust  
exhaust gases  
fire damage  
fog  
forest fires  
fumes  
haze detection  
∞ markers  
particles  
particulates  
smog  
smoldering  
soot  
vapors  
visibility
- smoke abatement**  
RT aerosols  
air pollution  
carbon dioxide removal  
exhaust gases  
pollution  
soot
- smoke detectors**  
GS measuring instruments  
. indicating instruments  
. . . **smoke detectors**  
RT fire prevention  
fumes  
gas detectors  
safety devices  
signal processing
- smoke trails**  
RT ∞ tracks  
wind direction  
wind measurement  
wind profiles
- smoldering**  
(added July 1997)  
DEF A slow, flameless combustion of a solid fuel.  
GS combustion  
. **smoldering**  
RT burning rate  
combustion stability  
erosive burning  
fires  
flammability



**smooth muscle**

smoke

**smooth muscle**

(added August 2004)

DEF Unstriated and unstriped muscle, one of the muscles of the internal organs, blood vessels, hair follicles, etc. Contractile elements are elongated, usually spindle-shaped cells with centrally located nuclei. Smooth muscle fibers are bound together into sheets or bundles by reticular fibers and frequently elastic nets are also abundant.

- UF *involuntary muscle*
- GS anatomy
  - . musculoskeletal system
  - . . muscles
  - . . . **smooth muscle**
- RT muscle cells
  - muscular function
  - skeletal muscle

**smoothing**

- GS **smoothing**
  - . data smoothing
- RT adjusting
  - flattening
  - honing
  - leveling
  - planing
  - polishing
  - roughness
  - structured grids (mathematics)

**SMS**

USE **Synchronous Meteorological Satellite**

**SMS 1**

DEF A meteorological satellite in synchronous orbit over the Atlantic Ocean to give coverage to the Eastern US. It was launched in May 1974 and is no longer operational, but still in orbit.

- GS artificial satellites
  - . meteorological satellites
  - . . Synchronous Earth Observatory satellite
  - . . . **SMS 1**
  - . . Synchronous Meteorological Satellite
  - . . . **SMS 1**
  - . synchronous satellites
  - . . Synchronous Earth Observatory satellite
  - . . . **SMS 1**
  - . . Synchronous Meteorological Satellite
  - . . . **SMS 1**
- RT GOES 2
  - NOAA satellites

**SMS 2**

DEF Meteorological satellite in synchronous orbit over Honolulu to give coverage to the Western US. It was launched in February 1975 and is no longer operational, but still in orbit.

- GS artificial satellites
  - . meteorological satellites
  - . . Synchronous Earth Observatory satellite
  - . . . **SMS 2**
  - . . Synchronous Meteorological Satellite
  - . . . **SMS 2**
  - . synchronous satellites
  - . . Synchronous Earth Observatory satellite
  - . . . **SMS 2**
  - . . Synchronous Meteorological Satellite
  - . . . **SMS 2**
- RT GOES 2
  - NOAA satellites

**SMS (Shuttle)**

USE **Shuttle Mission Simulator**

**SMU (maneuvering units)**

USE **self maneuvering units**

**S-N diagrams**

UF *fatigue diagrams*

- GS diagrams
  - . **S-N diagrams**
- RT bending fatigue
  - cyclic loads
  - fatigue (materials)
  - fatigue life
  - fatigue tests
  - metal fatigue
  - stress analysis
  - stress cycles
  - stress measurement
  - stress ratio

**snails**

- GS animals
  - . invertebrates
  - . . mollusks
  - . . . **snails**

**snakes**

- GS animals
  - . vertebrates
  - . . reptiles
  - . . . **snakes**

*snaking*

USE **lateral oscillation**

**SNAP**

- UF *Systems for Nuclear Auxiliary Power*
- GS auxiliary power sources
  - . nuclear auxiliary power units
  - . . **SNAP**
    - . . . fission electric cells
    - . . . . SNAP 2
    - . . . . SNAP 4
    - . . . . SNAP 8
    - . . . . SNAP 10A
    - . . . SNAP 1
    - . . . SNAP 3
    - . . . SNAP 7
    - . . . SNAP 9A
    - . . . SNAP 11
    - . . . SNAP 13
    - . . . SNAP 15
    - . . . SNAP 17
    - . . . SNAP 19
    - . . . SNAP 21
    - . . . SNAP 23
    - . . . SNAP 27
    - . . . SNAP 29
    - . . . SNAP 50
  - . nuclear electric power generation
  - . nuclear auxiliary power units
  - . . **SNAP**
    - . . . fission electric cells
    - . . . . SNAP 2
    - . . . . SNAP 4
    - . . . . SNAP 8
    - . . . . SNAP 10A
    - . . . SNAP 1
    - . . . SNAP 3
    - . . . SNAP 7
    - . . . SNAP 9A
    - . . . SNAP 11
    - . . . SNAP 13
    - . . . SNAP 15
    - . . . SNAP 17
    - . . . SNAP 19
    - . . . SNAP 21
    - . . . SNAP 23
    - . . . SNAP 27
    - . . . SNAP 29
    - . . . SNAP 50
- RT electric generators
  - heat exchangers
  - nuclear power reactors
  - SNAPTRAN reactor
  - space power unit reactors
  - $\infty$  systems
    - thermionic converters
    - thermionic power generation
    - thermoelectric generators
    - thermoelectric power generation
    - Transient Reactor Test Facility
    - turbogenerators

**SNAP 1**

- GS auxiliary power sources
  - . nuclear auxiliary power units

- . . SNAP
  - . . . **SNAP 1**
  - . nuclear electric power generation
  - . nuclear auxiliary power units
  - . . SNAP
    - . . . **SNAP 1**
- RT heat exchangers
  - turbogenerators

**SNAP 2**

- GS auxiliary power sources
  - . nuclear auxiliary power units
  - . . SNAP
    - . . . fission electric cells
    - . . . . **SNAP 2**
    - . . . space power reactors
    - . . . fission electric cells
    - . . . . **SNAP 2**
    - . nuclear electric power generation
    - . nuclear auxiliary power units
    - . . SNAP
      - . . . fission electric cells
      - . . . . **SNAP 2**
      - . . . space power reactors
      - . . . fission electric cells
      - . . . . **SNAP 2**
      - . nuclear power reactors
      - . space power reactors
      - . . fission electric cells
      - . . . . **SNAP 2**
      - . nuclear reactors
      - . nuclear power reactors
      - . space power reactors
      - . . fission electric cells
      - . . . . **SNAP 2**
  - RT heat exchangers
    - space power unit reactors
    - turbogenerators

**SNAP 3**

- GS auxiliary power sources
  - . nuclear auxiliary power units
  - . . SNAP
    - . . . **SNAP 3**
    - . electric generators
    - . direct power generators
    - . . thermoelectric generators
    - . . . **SNAP 3**
    - . nuclear electric power generation
    - . nuclear auxiliary power units
    - . . SNAP
      - . . . **SNAP 3**

**SNAP 4**

- GS auxiliary power sources
  - . nuclear auxiliary power units
  - . . SNAP
    - . . . fission electric cells
    - . . . . **SNAP 4**
    - . . . space power reactors
    - . . . fission electric cells
    - . . . . **SNAP 4**
    - . nuclear electric power generation
    - . nuclear auxiliary power units
    - . . SNAP
      - . . . fission electric cells
      - . . . . **SNAP 4**
      - . . . space power reactors
      - . . . fission electric cells
      - . . . . **SNAP 4**
      - . nuclear power reactors
      - . space power reactors
      - . . fission electric cells
      - . . . . **SNAP 4**
      - . nuclear reactors
      - . nuclear power reactors
      - . space power reactors
      - . . fission electric cells
      - . . . . **SNAP 4**
  - RT space power unit reactors

**SNAP 7**

- GS auxiliary power sources
  - . nuclear auxiliary power units
  - . . SNAP
    - . . . **SNAP 7**
    - . electric generators
    - . direct power generators
    - . . radioisotope batteries
    - . . . **SNAP 7**

- . . . thermoelectric generators
- . . . **SNAP 7**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 7**
- SNAP 8**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . fission electric cells
- . . . . **SNAP 8**
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 8**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . fission electric cells
- . . . . **SNAP 8**
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 8**
- . nuclear power reactors
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 8**
- nuclear reactors
- . nuclear power reactors
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 8**
- RT heat exchangers
- space power unit reactors
- turbogenerators
- SNAP 9A**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 9A**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 9A**
- . . thermoelectric generators
- . . . **SNAP 9A**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 9A**
- SNAP 10A**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . fission electric cells
- . . . . **SNAP 10A**
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 10A**
- electric generators
- . direct power generators
- . . thermoelectric generators
- . . . **SNAP 10A**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . fission electric cells
- . . . . **SNAP 10A**
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 10A**
- . nuclear power reactors
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 10A**
- nuclear reactors
- . nuclear power reactors
- . . space power reactors
- . . . fission electric cells
- . . . . **SNAP 10A**
- RT heat exchangers
- Snapshot satellite
- SNAP 11**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 11**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 11**
- . . thermoelectric generators
- . . . **SNAP 11**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 11**
- SNAP 13**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 13**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 13**
- . . thermionic converters
- . . . **SNAP 13**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 13**
- RT thermionic power generation
- SNAP 15**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 15**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 15**
- . . thermoelectric generators
- . . . **SNAP 15**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 15**
- SNAP 17**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 17**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 17**
- . . thermoelectric generators
- . . . **SNAP 17**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 17**
- SNAP 19**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 19**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 19**
- . . thermoelectric generators
- . . . **SNAP 19**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 19**
- SNAP 21**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 21**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 21**
- . . thermoelectric generators
- . . . **SNAP 21**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 21**
- . . . SNAP
- . . . **SNAP 21**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 23**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 23**
- . . thermoelectric generators
- . . . **SNAP 23**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 23**
- SNAP 27**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 27**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 27**
- . . thermoelectric generators
- . . . **SNAP 27**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 27**
- SNAP 29**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 29**
- electric generators
- . direct power generators
- . . radioisotope batteries
- . . . **SNAP 29**
- . . thermoelectric generators
- . . . **SNAP 29**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 29**
- SNAP 50**
- GS auxiliary power sources
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 50**
- . . space power reactors
- . . . **SNAP 50**
- nuclear electric power generation
- . nuclear auxiliary power units
- . . SNAP
- . . . **SNAP 50**
- . . space power reactors
- . . . **SNAP 50**
- nuclear reactors
- . nuclear power reactors
- . . space power reactors
- . . . **SNAP 50**
- RT space power unit reactors
- Snapshot satellite**
- GS artificial satellites
- . **Snapshot satellite**
- RT SNAP 10A
- SNAPTRAN reactor**
- RT  $\infty$  reactors
- . SNAP
- snatching*
- USE **spacecraft recovery**
- SNC meteorites**
- (added March 1998)
- DEF Meteorites with petrologic characteristics, isotopic signatures, trapped gas compositions, and relatively young crystallization ages

## sneak circuit analysis

(less than 1.3 billion years), which together point to a Martian origin. The name of these meteorites is derived from first three known examples-- Shergotty, Nakhla, and Chassigny.

- UF *Martian meteorites*  
*Shergotty Nakhla Chassigny meteorites*
- GS celestial bodies
  - . meteorites
  - . . stony meteorites
  - . . . achondrites
  - . . . . **SNC meteorites**
- RT chassignites  
Mars (planet)  
Mars surface  
nakhrites  
shergottites

### sneak circuit analysis

DEF In electrical or electronic circuits, the detection and/or prevention of "sneak circuits" -- paths having latent electrical conditions resulting from unapparent stimulus-response relationships which cause unwanted functions or inhibit desired function.

- GS network analysis
  - . **sneak circuit analysis**
- RT automatic test equipment  
circuit protection  
circuit reliability  
critical path method  
electric networks  
electrical faults  
reliability engineering  
short circuits  
signal flow graphs  
trees (mathematics)

### sneezing

- GS reflexes
  - . respiratory reflexes
  - . . **sneezing**
- RT involuntary actions  
vasoconstriction

### Snellen tests

- RT ∞ tests  
visual acuity

### Snells law

DEF A law of geometric optics that defines the amount of bending that takes place when a light ray strikes a refractive boundary (e.g., an air-glass interface) at a non-normal angle.

- GS laws
  - . **Snells law**
- RT geometrical optics
- ∞ optics  
refraction  
refractivity

### snow

DEF A form of ice composed of small white or translucent hexagonal crystals of frozen water, formed directly by sublimation of atmospheric water vapor around solid nuclei at a temperature below the freezing point. The crystals grow while floating or falling to the ground, and are often agglomerated into snowflakes.

- GS precipitation (meteorology)
  - . **snow**
- RT acid rain  
cirques (landforms)  
cloud glaciation  
graupel  
ice formation  
precipitation measurement  
slush  
storms (meteorology)

*Snow aerial applicator aircraft S-2B*

USE **agricultural aircraft**

### snow cover

- GS precipitation (meteorology)
  - . **snow cover**
- RT cloud glaciation  
cold weather  
Earth cryosphere  
storm damage

storms  
storms (meteorology)

*Snow S-2 aircraft*

USE **agricultural aircraft**

*snowplow effect*

USE **plasma dynamics**

### snowstorms

- GS storms
  - . storms (meteorology)
  - . . **snowstorms**
- RT climatology  
precipitation (meteorology)  
storm enhancement  
storm suppression  
weather forecasting  
weather modification

*SOAC (electronics)*

(added May 2001)

USE **systems-on-a-chip**

### ∞ soaking

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT baths  
heat treatment  
heating  
submerging  
water immersion  
wetting

### soaps

- RT detergents  
stearates  
surfactants  
wetting

### soaring

- RT climbing flight  
coasting flight
- ∞ flight  
gliders  
gliding  
hang gliders  
horizontal flight  
man powered aircraft  
vertical air currents

### Sobolev space

DEF A Banach space whose elements are functions defined in a domain in Euclidean space and whose norm measures the size and smoothness of the functions.

- GS algebra
  - . vector spaces
  - . . Banach space
  - . . . Hilbert space
  - . . . . **Sobolev space**
- analysis (mathematics)
  - . function space
  - . . Banach space
  - . . . Hilbert space
  - . . . . **Sobolev space**
- functional analysis
  - . . Banach space
  - . . . Hilbert space
  - . . . . **Sobolev space**
- geometry
  - . topology
  - . . metric space
  - . . . Hilbert space
  - . . . . **Sobolev space**
- RT boundary value problems  
Euclidean geometry

*SoC (microelectronics)*

(added December 2005)

USE **systems-on-a-chip**

### social factors

- GS sociology
  - . **social factors**
  - . . ethnic factors
- RT anthropology  
crime  
culture (social sciences)  
police

race factors  
space psychology  
Starsite program  
urban planning  
urban research  
∞ variable

### social isolation

- GS isolation
  - . **social isolation**
- RT sociology

### social psychiatry

- GS medical science
  - . psychiatry
  - . . **social psychiatry**
- RT sociology

### sociology

- GS **sociology**
  - . social factors
  - . . ethnic factors
- RT anthropology  
case histories  
cities  
communities  
culture (social sciences)  
demography  
dependence  
group dynamics  
human relations  
minorities  
politics  
race factors  
retirement  
social isolation  
social psychiatry  
systems analysis  
urban planning

### socks

- GS clothing
  - . **socks**
- RT fabrics  
shoes

### sod

DEF The top stratum of soil usually containing grassy plants with their matted roots.

- GS soils
  - . **sod**
- RT canopies (vegetation)  
farmlands  
grasses  
grasslands  
land  
plowing

### sodalite

- RT chemical reactions  
photochemical reactions  
photochromism

### sodar

DEF Meteorological instrument used to measure the scattering of sound waves by atmospheric turbulence.

- RT acoustic scattering  
atmospheric sounding  
atmospheric turbulence  
Doppler radar  
echo sounding  
meteorological instruments  
meteorology  
sound waves  
wind measurement  
wind profiles

### sodium

- GS chemical elements
  - . alkali metals
  - . . **sodium**
  - . . . liquid sodium
  - . . . sodium isotopes
  - . . . . sodium 22
  - . . . . sodium 24
  - . . . sodium vapor
- metals
  - . alkali metals
  - . . **sodium**

- ... liquid sodium
  - ... sodium isotopes
  - ... sodium 22
  - ... sodium 24
  - ... sodium vapor
- RT dawsonite
- electrolyte metabolism
- liquid metal cooled reactors
- sodium 22**
  - GS chemical elements
  - alkali metals
  - sodium
  - sodium isotopes
  - sodium 22**
  - nuclides
  - isotopes
  - radioactive isotopes
  - sodium 22**
  - sodium isotopes
  - sodium 22**
  - metals
  - alkali metals
  - sodium
  - sodium isotopes
  - sodium 22**
- sodium 24**
  - GS chemical elements
  - alkali metals
  - sodium
  - sodium isotopes
  - sodium 24**
  - nuclides
  - isotopes
  - radioactive isotopes
  - sodium 24**
  - sodium isotopes
  - sodium 24**
  - metals
  - alkali metals
  - sodium
  - sodium isotopes
  - sodium 24**
- sodium alloys**
  - GS alloys
  - sodium alloys**
- sodium azides**
  - GS nitrogen compounds
  - azides (inorganic)
  - sodium azides**
  - azides (organic)
  - sodium azides**
  - sodium compounds
  - sodium azides**
- RT detonators
- explosives
- sodium bromides**
  - GS halogen compounds
  - bromine compounds
  - bromides
  - sodium bromides**
  - halides
  - bromides
  - sodium bromides**
  - metal halides
  - alkali halides
  - sodium bromides**
  - sodium compounds
  - sodium bromides**
- sodium carbonates**
  - GS carbon compounds
  - carbonates
  - sodium carbonates**
  - sodium compounds
  - sodium carbonates**
- RT dawsonite
- sodium channels (biology)*  
(added August 2002)
- USE **ion channels (biology)**
- sodium chlorides**
  - GS halogen compounds
  - chlorine compounds
  - chlorides
- ... **sodium chlorides**
  - halides
  - chlorides
  - sodium chlorides**
  - metal halides
  - alkali halides
  - sodium chlorides**
  - sodium compounds
  - sodium chlorides**
- RT molten salts
- salt beds
- ∞ salts
- sodium chlorodifluoroacetates**
  - GS acetates
  - sodium chlorodifluoroacetates**
  - esters
  - sodium chlorodifluoroacetates**
- sodium chromites**
  - GS chromium compounds
  - sodium chromites**
  - sodium compounds
  - sodium chromites**
- sodium compounds**
  - GS **sodium compounds**
  - cryolite
  - Nembutal (trademark)
  - nepheline
  - sodium azides
  - sodium bromides
  - sodium carbonates
  - sodium chlorides
  - sodium chromites
  - sodium fluorides
  - sodium gallates
  - sodium hydrides
  - sodium hydroxides
  - sodium iodides
  - sodium nitrates
  - sodium peroxides
  - sodium salicylates
  - sodium silicates
  - spodumene
  - talc
  - tourmaline
  - sodium sulfates
  - sodium sulfites
- RT ∞ alkali metal compounds
- bleedite
- ∞ chemical compounds
- ∞ metal compounds
- sodium cooling**
  - SN (COOLING WITH SODIUM)
  - GS cooling
  - sodium cooling**
- RT coolants
- liquid cooled reactors
- liquid cooling
- sodium fluorides**
  - GS halogen compounds
  - fluorine compounds
  - fluorides
  - metal fluorides
  - sodium fluorides**
  - halides
  - fluorides
  - metal fluorides
  - sodium fluorides**
  - metal halides
  - alkali halides
  - sodium fluorides**
  - sodium compounds
  - sodium fluorides**
- sodium gallates**
  - GS gallium compounds
  - gallates
  - sodium gallates**
  - sodium compounds
  - sodium gallates**
- sodium graphite reactors**
  - UF *SGR (nuclear reactors)*
  - GS nuclear reactors
- liquid cooled reactors
- liquid metal cooled reactors
- ... **sodium graphite reactors**
- RT Hallam Nuclear Power Facility
- nuclear power reactors
- sodium hydrides**
  - GS hydrogen compounds
  - hydrides
  - metal hydrides
  - sodium hydrides**
  - sodium compounds
  - sodium hydrides**
- sodium hydroxides**
  - GS bases (chemical)
  - alkalies
  - sodium hydroxides**
  - hydroxides
  - sodium hydroxides**
  - sodium compounds
  - sodium hydroxides**
- sodium iodides**
  - GS halogen compounds
  - halides
  - metal halides
  - alkali halides
  - sodium iodides**
  - iodine compounds
  - iodides
  - sodium iodides**
  - sodium compounds
  - sodium iodides**
- sodium isotopes**
  - GS chemical elements
  - alkali metals
  - sodium
  - sodium isotopes**
  - sodium 22
  - sodium 24
  - nuclides
  - isotopes
  - sodium isotopes**
  - sodium 22
  - sodium 24
  - metals
  - alkali metals
  - sodium
  - sodium isotopes**
  - sodium 22
  - sodium 24
- metals
- alkali metals
- sodium
- sodium isotopes**
- sodium 22
- sodium 24
- sodium nitrates**
  - GS nitrogen compounds
  - nitrates
  - inorganic nitrates
  - sodium nitrates**
  - sodium compounds
  - sodium nitrates**
- sodium peroxides**
  - GS chalcogenides
  - oxides
  - anhydrides
  - peroxides
  - sodium peroxides**
  - metal oxides
  - sodium peroxides**
  - sodium compounds
  - sodium peroxides**
- sodium reactor experiment**
  - UF *SRE reactor*
  - GS nuclear reactors
  - liquid cooled reactors
  - liquid metal cooled reactors
  - sodium reactor experiment**
  - nuclear research and test reactors
  - sodium reactor experiment**
- sodium salicylates**
  - GS esters
  - sodium salicylates**
  - salicylates
  - sodium salicylates**
  - sodium compounds

## sodium silicates

. sodium salicylates

### sodium silicates

GS silicon compounds  
. silicates  
. . . **sodium silicates**  
. . . spodumene  
. . . talc  
. . . tourmaline  
sodium compounds  
. **sodium silicates**  
. . . spodumene  
. . . talc  
. . . tourmaline  
RT minerals  
plagioclase

### sodium sulfates

DEF Sodium compounds containing the -SO<sub>4</sub> group.  
GS sodium compounds  
. **sodium sulfates**  
sulfur compounds  
. sulfates  
. . . **sodium sulfates**

### sodium sulfites

GS sodium compounds  
. **sodium sulfites**  
sulfur compounds  
. sulfites  
. . . **sodium sulfites**

### sodium sulfur batteries

DEF One of several types of rechargeable batteries under consideration as power sources for electrically actuated vehicles. This battery uses a solid electrolyte as well as a sodium reservoir made of metal.  
GS electric generators  
. direct power generators  
. . . primary batteries  
. . . **sodium sulfur batteries**  
electrochemical cells  
. electric batteries  
. . . primary batteries  
. . . **sodium sulfur batteries**  
RT ∞ electric cells

### sodium vapor

GS chemical elements  
. alkali metals  
. . . sodium  
. . . **sodium vapor**  
metals  
. alkali metals  
. . . sodium  
. . . **sodium vapor**  
. metal vapors  
. . . **sodium vapor**  
vapors  
. metal vapors  
. . . **sodium vapor**  
RT mercury vapor

### SO FAR

USE **sound fixing and ranging**

### SOFIA (airborne observatory)

(added March 1990)  
SN (STRATOSPHERIC OBSERVATORY FOR INFRARED ASTRONOMY)  
UF *Stratospheric Observatory for IR Astronomy*  
GS observatories  
. astronomical observatories  
. . . **SOFIA (airborne observatory)**  
RT airborne equipment  
Boeing 747 aircraft  
infrared astronomy  
Kuiper Airborne Observatory  
spaceborne astronomy

### soft gamma repeaters

(added January 2000)  
DEF A class of x-ray source which emits repeating bright bursts of "soft" or low-energy gamma rays, along with steady x-ray pulsations. By the end of 1999 only a handful of these sources had been identified in our galaxy and in the Large Magellanic Cloud. Since they are

associated with supernova remnants, these sources are probably some kind of young neutron star. One theory holds that these stars are young magnetars (magnetically-powered neutron stars). Bright bursts occur when the evolving, ultra-strong magnetic field stresses the neutron star's solid crust to breaking, in a sudden starquake. X-ray pulsations are due to the rotation of the star, with it's hot surface bright in x-rays.

UF *SGR (astronomy)*  
GS celestial bodies  
. stars  
. . . neutron stars  
. . . **soft gamma repeaters**  
. . . x ray stars  
. . . **soft gamma repeaters**  
gamma ray sources (astronomy)  
. **soft gamma repeaters**  
x ray sources  
. x ray stars  
. . . **soft gamma repeaters**  
RT gamma ray astronomy  
gamma ray bursts  
magnetars  
supernova remnants

### soft landing

SN (SPACECRAFT OR AIRCRAFT)  
DEF The act of landing on the surface of a planet or natural satellite without damage to any portion of the vehicle or payload except possibly the landing gear. Used for soft recovery.  
UF *soft recovery*  
GS landing  
. **soft landing**  
RT aircraft landing  
∞ astronautics  
crash landing  
glide landings  
hard landing  
horizontal spacecraft landing  
lunar landing  
Mars landing  
planetary landing  
spacecraft landing  
Surveyor project  
Viking 1975 entry vehicle  
water landing

### soft landing spacecraft

UF *SLV (soft landing vehicles)*  
GS **soft landing spacecraft**  
. aerospace planes  
. . . HOPE aerospace plane  
. . . HOTOL launch vehicle  
. . . VentureStar launch vehicle  
. . . X-30 vehicle  
. . . X-37 vehicle  
. . . X-40A vehicle  
. Apollo spacecraft  
. . . Apollo lunar experiment module  
. Astro vehicle  
. Buran space shuttle  
. Gemini B spacecraft  
. Gemini spacecraft  
. . . Gemini 2 spacecraft  
. . . Gemini (GT-1) spacecraft  
. Janus spacecraft  
. landing modules  
. . . lunar landing modules  
. . . . Lunar Module  
. . . . Apollo lunar experiment module  
. . . . LSSM  
. . . . Lunar Module 5  
. . . . Lunar Module 7  
. . . . Altair Lunar Lander  
. . . Mars Excursion Module  
. Mercury spacecraft  
. . . Aurora 7  
. . . Faith 7  
. . . Friendship 7  
. . . SIGMA 7  
. Surveyor lunar probes  
. . . Surveyor 1 lunar probe  
. . . Surveyor 2 lunar probe  
. . . Surveyor 3 lunar probe  
. . . Surveyor 4 lunar probe  
. . . Surveyor 5 lunar probe  
. . . Surveyor 6 lunar probe

. . . Surveyor 7 lunar probe  
. voskhod manned spacecraft  
. . . Voskhod 1 spacecraft  
. . . Voskhod 2 spacecraft  
. Vostok spacecraft  
. . . Vostok 1 spacecraft  
. . . Vostok 2 spacecraft  
. . . Vostok 3 spacecraft  
. . . Vostok 4 spacecraft  
. . . Vostok 5 spacecraft  
. . . Vostok 6 spacecraft  
RT Apollo project  
ferry spacecraft  
hovering rocket vehicles  
lunar probes  
reusable spacecraft  
space capsules  
∞ spacecraft  
spacecraft landing  
Surveyor project  
X-20 aircraft

### soft recovery

USE **soft landing**

### softening

SN (EXCLUDES WATER SOFTENING)  
GS **softening**  
. work softening  
RT annealing  
deionization  
demineralizing  
digesting  
dissolving  
hardening (materials)  
ion exchanging

### softness

RT ductility  
elastic properties  
flexibility  
hardness  
stiffness

### software (computers)

USE **computer programs**

### software development tools

DEF Computer programs that aid in the specification, construction, testing, analysis, management, documentation, and maintenance of other computer programs.  
UF *software tools*  
GS computer programs  
. **software development tools**  
tools  
. **software development tools**  
RT applications programs (computers)  
architecture (computers)  
computer systems design  
object-oriented programming  
program verification (computers)  
programming environments  
reverse engineering  
scientific visualization  
software engineering  
software reuse

### software engineering

DEF The systematic approach to the development, operation, maintenance, and retirement of software.  
RT computer programming  
computer programs  
computer systems design  
computer systems programs  
computer viruses  
data bases  
∞ engineering  
object-oriented programming  
open source licensing (computers)  
programming environments  
reverse engineering  
software development tools  
software reliability  
software reuse  
structured programming  
systems engineering

- UNIX (operating system)
- software engineering environments*  
USE **programming environments**
- software reliability**  
(added January 1993)  
UF *computer program reliability*  
*program reliability (computers)*  
reliability  
GS . **software reliability**  
. . . computer program integrity  
RT computer programming  
computer programs  
computer systems performance  
program verification (computers)  
reliability analysis  
software engineering  
systems health monitoring
- software reuse**  
(added May 1992)  
GS utilization  
. reuse  
. . **software reuse**  
RT computer programming  
computer programs  
productivity  
software development tools  
software engineering
- software tools*  
USE **software development tools**
- SOHO Mission**  
(added September 1989)  
DEF One of the joint NASA/ESA missions comprising the International Solar Terrestrial Program. The SOHO Mission will investigate the physical processes in the solar corona and solar wind and the structure and dynamics of the solar interior.  
UF *Solar and Heliospheric Observatory*  
GS space missions  
. **SOHO Mission**  
RT Cluster Mission  
ESA satellites  
European space programs  
heliosphere  
international cooperation  
∞ missions  
scientific satellites  
solar corona  
solar interior  
solar observatories  
solar wind  
Transition Region and Coronal Explorer
- SOI (semiconductors)**  
DEF Semiconductor devices consisting of a silicon layer coupled to an electrically insulating layer. Used for silicon-on-insulator semiconductors.  
UF *silicon-on-insulator semiconductors*  
GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . **SOI (semiconductors)**  
RT field effect transistors  
metal oxide semiconductors  
silicon films  
silicon junctions  
silicon transistors  
SIS (semiconductors)  
SOS (semiconductors)
- soil contamination*  
USE **soil pollution**
- soil erosion**  
GS erosion  
. **soil erosion**  
RT abrasion  
atmospheric effects  
deterioration  
environment effects  
hydrogeology  
landslides  
outliers (landforms)
- rain erosion  
rain impact damage  
soils  
water erosion  
weathering  
wind effects
- soil mapping**  
GS mapping  
. **soil mapping**  
RT geographic applications program  
ground penetrating radar  
maps  
Mars Reconnaissance Orbiter  
photomapping  
soils  
SPOT (French satellite)  
surveys  
terrain analysis
- soil mechanics**  
DEF Mechanical properties of unconsolidated accumulations of particles produced by the disintegration and chemical decomposition of rocks.  
RT crustal fractures  
fracture mechanics  
geotechnical engineering  
geotechnical fabrics  
rock mechanics
- soil moisture**  
GS moisture  
. **soil moisture**  
RT lysimeters  
moisture content  
plant stress  
soil sampling  
soils  
vegetation growth
- soil pollution**  
(added September 1995)  
UF *soil contamination*  
GS pollution  
. environment pollution  
. . **soil pollution**  
RT contaminants  
environmental cleanup  
ground water  
heavy metals  
industrial wastes  
pollution monitoring  
radioactive wastes  
sediments  
toxicity and safety hazard  
waste disposal  
water pollution
- soil sampling**  
(added March 1995)  
GS sampling  
. **soil sampling**  
RT alkalinity  
Mars surface samples  
pH factor  
salinity  
soil moisture  
terrain analysis
- soil science**  
UF *pedology*  
RT agriculture  
conservation  
erosion  
soils  
vegetation growth
- soils**  
GS **soils**  
. alluvium  
. dirt  
. gravels  
. laterites  
. lunar soil  
. . lunar dust  
. mud  
. permafrost  
. sands  
. . monazite sands
- . . tar sands  
. sod  
RT andesite  
anorthosite  
arid lands  
ataxite  
barren land  
basalt  
bedrock  
bentonite  
boreholes  
breccia  
carbonaceous rocks  
clays  
coal  
conservation  
cultivation  
deltas  
diorite  
dunite  
Earth resources  
eclogite  
enstatite  
formations  
geology  
gneiss  
granite  
igneous rocks  
illite  
kaolinite  
land  
landslides  
lava  
limestone  
lysimeters  
magma  
minerals  
moldavite  
muskegs  
obsidian  
olivine  
peridotite  
planting  
polyurethane foam  
porous materials  
pumice  
pyroxenes  
quartz  
rocks  
sandstones  
sedimentary rocks  
serpentine  
shales  
soil erosion  
soil mapping  
soil moisture  
soil science  
strip mining  
syenite  
trachyte  
tunneling (excavation)  
vadose water  
vegetation growth
- solar activity**  
DEF Any type of variation in the appearance of energy output of the sun.  
GS stellar activity  
. **solar activity**  
. . faculae  
. . solar flares  
. . solar prominences  
. . solar storms  
. . spicules  
. . sunspots  
RT ∞ activity  
auroras  
∞ disturbances  
International Quiet Sun Year  
interplanetary shock waves  
IRIS satellites  
magnetic disturbances  
prominences  
radio auroras  
solar convection (astronomy)  
solar interior  
solar planetary interactions  
starspots  
STEREO (observatory)

## solar activity effects

sun  
sunspot cycle

### solar activity effects

RT blackout (propagation)  
∞ effects  
galactic cosmic rays  
heliosphere  
interplanetary shock waves  
magnetic disturbances  
secular variations  
solar oscillations  
solar planetary interactions  
space weather  
sudden ionospheric disturbances  
sudden storm commencements  
sun

*Solar and Heliospheric Observatory*

USE **SOHO Mission**

### solar arrays

UF *rollup solar arrays*  
GS arrays  
. **solar arrays**  
. . solar blankets  
RT electrostatic bonding  
payload delivery (STS)  
photovoltaic conversion  
power modules (STS)  
satellite power transmission  
self shadowing  
solar atriums  
solar energy conversion  
space station power supplies  
sun

### solar atmosphere

GS environments  
. extraterrestrial environments  
. . stellar atmospheres  
. . . **solar atmosphere**  
. . . . solar transition region  
RT ∞ atmospheres  
chromosphere  
M region  
photosphere  
solar convection (astronomy)  
solar oscillations  
spicules  
stellar structure  
sun  
Transition Region and Coronal Explorer

### solar atriums

DEF Open courts within buildings designed for passive solar heating.  
RT solar arrays  
solar heating  
solar reflectors  
space heating (buildings)  
sun

### solar auxiliary power units

GS auxiliary power sources  
. **solar auxiliary power units**  
. . ASTEC solar turboelectric generator  
electric generators  
. solar generators  
. . **solar auxiliary power units**  
. . . ASTEC solar turboelectric generator  
RT sun

*solar azimuth*

USE **azimuth**  
**solar position**

### Solar Backscatter UV Spectrometer

DEF A spaceborne spectrometer that measures solar UV spectral irradiance incident on the Earth and backscattered radiance from the Earth and thereby estimates the total atmospheric ozone content of the atmosphere and the attitude distribution of ozone.

GS measuring instruments  
. spectrometers  
. . **Solar Backscatter UV**

### Spectrometer

RT irradiance  
NOAA 11 satellite  
NOAA 14 satellite  
satellite-borne instruments

### solar blankets

DEF Large, high-temperature, low-mass solar arrays consisting of ultrathin silicon solar cells interconnected, welded, and bonded to flexible substances.  
GS arrays  
. solar arrays  
. . **solar blankets**  
electric generators  
. direct power generators  
. . thermionic converters  
. . . **solar blankets**  
RT ∞ blankets  
∞ converters  
sun

### Solar Cell Calibration Facility

DEF One of the spacelab payloads. Used for SCCF.

UF *SCCF*  
GS payloads  
. Spacelab payloads  
. . **Solar Cell Calibration Facility**  
RT calibrating  
∞ facilities  
Space Transportation System flights

### solar cells

DEF Photovoltaic cells that convert sunlight into electrical energy. Used for silicon solar cells and wraparound contact solar cells.

UF *silicon solar cells*  
*wraparound contact solar cells*  
GS electric generators  
. direct power generators  
. . photoelectric generators  
. . . photovoltaic cells  
. . . . **solar cells**  
. . . . . vertical junction solar cells  
. solar generators  
. . **solar cells**  
. . . vertical junction solar cells  
electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . photovoltaic cells  
. . . . **solar cells**  
. . . . . vertical junction solar cells  
photoelectric cells  
. photovoltaic cells  
. . **solar cells**  
. . . vertical junction solar cells  
RT amorphous silicon  
antireflection coatings  
carrier lifetime  
carrier transport (solid state)

∞ cells  
copper indium selenides  
diffusion length  
∞ electric cells  
electrostatic bonding  
float zones  
fuel cells  
heterojunctions  
homojunctions  
indium selenides  
open circuit voltage  
photodiodes  
photovoltaic conversion  
p-i-n junctions  
quantum efficiency  
satellite power transmission  
satellite solar energy conversion  
satellite solar power stations  
short circuit currents  
SIS (semiconductors)  
solar energy conversion  
solar powered aircraft  
space station power supplies  
spectrophotovoltaics  
sun  
thermionic converters  
thermoelectric generators  
thermophotovoltaic conversion

tunnel junctions

### solar collectors

DEF Devices designed to absorb incident solar radiation and transfer the energy to a fluid passing through it. Used for solar receivers.  
UF *solar receivers*  
GS accumulators  
. **solar collectors**  
reflectors  
. solar reflectors  
. . **solar collectors**  
RT concentrators  
mirrors  
photothermal conversion  
selective surfaces  
solar dynamic power systems  
solar energy conversion  
space cooling (buildings)  
spectrophotovoltaics  
sun

*solar companion star*

USE **Nemesis (star)**

### solar compasses

GS measuring instruments  
. indicating instruments  
. . compasses  
. . . **solar compasses**  
navigation aids  
. navigation instruments  
. . compasses  
. . . **solar compasses**  
RT air navigation  
air traffic control  
aircraft safety  
airport beacons  
all-weather air navigation  
approach indicators  
automatic flight control  
automatic pilots  
beacons  
Decca navigation  
display devices  
distance measuring equipment  
flight control  
flight instruments  
flight paths  
gyrocompasses  
heliports  
homing devices  
landing aids  
loran  
magnetic compasses  
omnidirectional radio ranges  
position indicators  
radar beacons  
radio beacons  
radio navigation  
self calibrating omnirange  
Shoran  
sun  
Tacan  
VHF omnirange navigation  
weather

### solar constant

DEF The rate at which solar radiation is received outside the Earth's atmosphere on a surface normal to the incident radiation and at the Earth's mean distance from the sun.

GS constants  
. **solar constant**  
rates (per time)  
. flux density  
. . radiant flux density  
. . . irradiance  
. . . . **solar constant**  
. . . . . solar flux density  
. . . . . **solar constant**  
solar energy  
. solar flux density  
. . **solar constant**

RT illuminance  
particle flux density  
sun

### solar convection (astronomy)

(added June 1992)

- SN (LIMITED TO CONVECTION PHENOMENA OF THE SOLAR ATMOSPHERE AND INTERIOR)
- GS convection  
 . stellar convection  
 . . **solar convection (astronomy)**
- RT Benard cells  
 convection currents  
 convective flow  
 dynamo theory  
 fluid flow  
 free convection  
 Rayleigh-Benard convection  
 solar activity  
 solar atmosphere  
 solar interior  
 solar magnetic field  
 solar physics
- solar converters*  
 USE **solar generators**
- solar cooling**  
 DEF Conversion of solar energy into refrigeration energy.  
 GS cooling  
 . **solar cooling**
- RT cooling systems  
 domestic energy  
 energy technology  
 residential energy  
 solar energy conversion  
 space cooling (buildings)  
 sun
- solar corona**  
 GS coronas  
 . stellar coronas  
 . . **solar corona**  
 . . . coronal holes  
 . . . coronal loops
- RT chromosphere  
 coronal mass ejection  
 electric corona  
 interplanetary shock waves  
 magnetic clouds  
 nebulae  
 SOHO Mission  
 solar transition region  
 stellar structure  
 sun  
 Transition Region and Coronal Explorer
- solar corpuscular radiation**  
 UF *solar streams*  
 GS extraterrestrial radiation  
 . solar radiation  
 . . **solar corpuscular radiation**  
 . . . solar electrons  
 . . . solar neutrinos  
 . . . solar neutrons  
 . . . solar protons  
 particles  
 . corpuscular radiation  
 . . **solar corpuscular radiation**  
 . . . solar electrons  
 . . . solar neutrinos  
 . . . solar neutrons  
 . . . solar protons
- RT Advanced Composition Explorer  
 M region
- $\infty$  radiation  
 solar planetary interactions  
 sudden storm commencements  
 sun  
 Wind/GGS spacecraft
- solar cosmic rays**  
 DEF Cosmic rays supposedly originating in the sun.  
 GS extraterrestrial radiation  
 . primary cosmic rays  
 . . **solar cosmic rays**  
 . solar radiation  
 . . **solar cosmic rays**  
 ionizing radiation  
 . cosmic rays  
 . . primary cosmic rays  
 . . . **solar cosmic rays**
- particles  
 . corpuscular radiation  
 . . primary cosmic rays  
 . . . **solar cosmic rays**
- RT Advanced Composition Explorer  
 electron acceleration  
 energetic particles  
 GRIST (telescope)  
 sun
- solar cycles**  
 GS cycles  
 . **solar cycles**  
 . . sunspot cycle
- RT International Quiet Sun Year  
 IRIS satellites  
 secular variations  
 sun  
 sunspots  
 twenty-seven day variation
- solar diameter**  
 DEF Observable dimension of the sun.  
 RT astrometry  
 $\infty$  science  
 solar eclipses
- solar disk*  
 USE **sun**
- solar dynamic power systems**  
 DEF Electric power systems using a solar heated working fluid to drive a turboalternator. Primary applications are for space stations and spacecraft.  
 GS electric generators  
 . solar generators  
 . . **solar dynamic power systems**  
 electric power supplies  
 . **solar dynamic power systems**
- RT Brayton cycle  
 heat storage  
 photothermal conversion  
 Rankine cycle  
 solar collectors  
 solar energy conversion  
 solar thermal electric power plants  
 space station power supplies  
 spacecraft power supplies  
 Stirling cycle
- solar dynamics*  
 USE **helioseismology**
- solar eclipses**  
 DEF Obscurations of the light of the sun by the moon.  
 GS eclipses  
 . **solar eclipses**  
 occultation  
 . lunar occultation  
 . . **solar eclipses**
- RT lunar shadow  
 solar diameter  
 sun
- solar electric propulsion**  
 GS propulsion  
 . electric propulsion  
 . . **solar electric propulsion**  
 . low thrust propulsion  
 . . solar propulsion  
 . . . **solar electric propulsion**  
 . spacecraft propulsion  
 . . solar propulsion  
 . . . **solar electric propulsion**
- RT Deep Space 1 Mission  
 solar powered aircraft  
 solar thermal propulsion  
 space station propulsion  
 sun
- solar electrons**  
 GS extraterrestrial radiation  
 . solar radiation  
 . . solar corpuscular radiation  
 . . . **solar electrons**  
 particles  
 . charged particles  
 . . energetic particles
- . . . electrons  
 . . . **solar electrons**  
 . corpuscular radiation  
 . energetic particles  
 . . electrons  
 . . . **solar electrons**  
 . solar corpuscular radiation  
 . . **solar electrons**  
 . elementary particles  
 . fermions  
 . . leptons  
 . . . electrons  
 . . . . **solar electrons**
- RT sun
- solar energy**  
 SN (LIMITED TO DISCUSSIONS OF THE RADIANT ENERGY ORIGINATING FROM THE SUN. FOR SOLAR ENERGY TECHNOLOGIES REFER TO 'SOLAR ENERGY CONVERSION' AND ITS ASSOCIATED TERMS)  
 DEF The radiant energy originating from the sun. Approximately 998 of solar energy lies between the wavelengths of 300 to 3,500 nm.  
 GS **solar energy**  
 . solar flux  
 . solar flux density  
 . . solar constant  
 . insolation
- RT  $\infty$  energy  
 IRIS satellites  
 solar radiation  
 sun  
 sunlight  
 Surface Meteorology and Solar Energy project
- solar energy absorbers**  
 GS absorbers (materials)  
 . **solar energy absorbers**
- RT electromagnetic absorption  
 photothermal conversion  
 selective surfaces  
 sun  
 Trombe walls
- solar energy conversion**  
 GS energy conversion  
 . **solar energy conversion**  
 . . photothermal conversion  
 . . . thermophotovoltaic conversion  
 . . photovoltaic conversion  
 . . . thermophotovoltaic conversion  
 . . solar total energy systems
- RT cogeneration  
 $\infty$  conversion  
 energy technology  
 heterojunction devices  
 hydrogen production  
 phase change materials  
 photoelectric generators  
 photoelectrochemical devices  
 renewable energy  
 solar arrays  
 solar cells  
 solar collectors  
 solar cooling  
 solar dynamic power systems  
 solar generators  
 solar heating  
 solar-pumped lasers  
 space cooling (buildings)  
 sun
- solar faculae*  
 USE **faculae**
- solar flares**  
 DEF A rapid release of electromagnetic (visible, radio, ultraviolet, x ray) and particulate (protons, electrons) energy from the sun. Flares are classified according to the optically observed area of the solar surface covered, ranging from zero for the smallest to 3 for the largest, and their intensity, either faint, normal, or brilliant.  
 GS stellar activity  
 . solar activity  
 . . **solar flares**  
 . stellar flares



## solar flux

. . **solar flares**  
RT coronal loops  
coronal mass ejection  
flare stars  
∞ flares  
∞ flash  
Forbush decreases  
force-free magnetic fields  
interplanetary shock waves  
IRIS satellites  
magnetic disturbances  
Solar Maximum Mission  
solar neutrons  
sudden storm commencements  
sun  
sunspots

**solar flux**  
SN (LIMITED TO ENERGY OR PARTICLES  
EMITTED FROM THE SUN PER UNIT  
TIME--SEE SOLAR FLUX DENSITY FOR  
ENERGY OR PARTICLE EMISSION OR  
DETECTION RATE PER UNIT AREA)  
GS rates (per time)  
. flux (rate)  
. . **solar flux**  
solar energy  
. **solar flux**  
RT heat flux  
limb brightening  
sun

**solar flux density**  
SN (LIMITED TO SOLAR ENERGY OR  
PARTICLE EMISSION OR DETECTION  
RATE UNIT AREA--SEE SOLAR FLUX FOR  
EMISSION RATE PER UNIT TIME)  
GS rates (per time)  
. flux density  
. . radiant flux density  
. . . **solar flux density**  
. . . . solar constant  
solar energy  
. **solar flux density**  
. . solar constant  
RT electron flux density  
Helios satellites  
illuminance  
irradiance  
limb brightening  
luminance  
luminous intensity  
particle flux density  
proton flux density  
radiance  
radiancy  
radiation pressure  
sun

**solar furnaces**  
GS heating equipment  
. furnaces  
. . **solar furnaces**  
RT Forbush decreases  
melting  
sun  
vacuum furnaces

**solar generators**  
UF *solar converters*  
*solar power generation*  
*solar power sources*  
GS electric generators  
. **solar generators**  
. . solar auxiliary power units  
. . . ASTEC solar turboelectric  
generator  
. . solar cells  
. . . vertical junction solar cells  
. . solar dynamic power systems  
RT direct power generators  
fuel cells  
paddles  
photoelectric cells  
photoelectric generators  
photovoltaic cells  
∞ power supplies  
Rankine cycle  
solar energy conversion  
solar sea power plants  
sun  
thermoelectric generators

turbogenerators

**solar granulation**  
GS photosphere  
. **solar granulation**  
RT Benard cells  
brightness distribution  
convection currents  
limb brightening  
sun  
surface layers  
temperature effects

**solar gravitation**  
UF *evection*  
GS gravitation  
. stellar gravitation  
. . **solar gravitation**  
RT sun

**solar heating**  
GS heating  
. **solar heating**  
RT bioconversion  
hydrothermal systems  
insolation  
phase change materials  
radiant heating  
residential energy  
solar atriums  
solar energy conversion  
space heating (buildings)  
sun  
sunlight  
Trombe walls

**solar houses**  
DEF Habitable buildings designed with  
large expanses of glass or other transparent  
materials to collect solar radiation for heating.  
RT buildings  
domestic energy  
energy technology  
heat storage  
residential energy  
space heating (buildings)  
sun  
Trombe walls

**solar instruments**  
GS **solar instruments**  
. spectroheliographs  
RT telescopes  
filtergrams  
optical measuring instruments  
radiation measuring instruments  
solar optical telescope  
spectrometers  
sun  
telescopes

**solar interior**  
GS stellar interiors  
. **solar interior**  
RT helioseismology  
SOHO Mission  
solar activity  
solar convection (astronomy)  
solar physics  
stellar cores  
stellar structure  
sun

*solar lasers*  
USE **solar-pumped lasers**

**solar limb**  
RT coronal loops  
limb brightening  
limb darkening  
∞ limbs  
planetary limb  
sun

**solar longitude**  
GS longitude  
. **solar longitude**  
RT astronomical coordinates  
celestial reference systems

sun

**solar magnetic field**  
UF *heliomagnetism*  
GS magnetic fields  
. stellar magnetic fields  
. . **solar magnetic field**  
RT electromagnetic fields  
force-free magnetic fields  
interplanetary magnetic fields  
magnetic field reconnection  
solar convection (astronomy)  
sun  
Transition Region and Coronal  
Explorer

**Solar Maximum Mission**  
DEF Use of the multimission modular  
spacecraft for the study of solar particles, emis-  
sions, and flares.  
GS space missions  
. **Solar Maximum Mission**  
. . Solar Maximum Mission-A  
RT ∞ flares  
flux density  
gamma ray spectrometers  
∞ missions  
multimission modular spacecraft  
polarimeters  
programs  
solar flares  
space programs  
sun  
ultraviolet spectrometers  
Ulysses mission

**Solar Maximum Mission-A**  
DEF The solar maximum mission space-  
craft. Used for SMM-A.  
UF *SMM-A*  
GS space missions  
. Solar Maximum Mission  
. . **Solar Maximum Mission-A**  
RT ∞ missions  
space exploration  
∞ spacecraft  
sun

**Solar Mesosphere Explorer**  
DEF A satellite whose experiments pro-  
vided a comprehensive study of atmospheric  
ozone and the processes which form and de-  
stroy it. The satellite was launched in October of  
1981. On May 15, 1989, the mission was termi-  
nated due to battery problems.  
GS artificial satellites  
. scientific satellites  
. . Explorer satellites  
. . . **Solar Mesosphere Explorer**  
RT atmospheric composition  
mesosphere  
ozone  
sun

**solar nebula**  
(added June 2001)  
DEF Clouds of gas and dust from which the  
Sun, planets, and other solar system bodies  
formed.

UF *protosolar nebula*  
GS celestial bodies  
. nebulae  
. . **solar nebula**  
RT meteoritic composition  
planetary evolution  
protoplanets  
protostars  
solar system  
solar system evolution  
star formation  
stellar evolution  
sun

**solar neighborhood**  
DEF The portion of the Milky Way Galaxy  
centering around the sun and containing the  
nearest neighboring stars.  
RT astronomy  
celestial bodies  
local group (astronomy)

- Milky Way Galaxy  
Nemesis (star)  
solar system  
star clusters  
stars  
sun
- solar neutrinos**  
DEF Neutral particles originating from nuclear reactions in the core of the sun.  
GS extraterrestrial radiation  
. solar radiation  
. . solar corpuscular radiation  
. . . **solar neutrinos** particles  
. corpuscular radiation  
. . solar corpuscular radiation  
. . . **solar neutrinos**  
. elementary particles  
. . fermions  
. . . leptons  
. . . . neutrinos  
. . . . . **solar neutrinos**  
RT astronomical models  
astrophysics  
nuclear reactions  
stellar models  
sun  
weakly interacting massive particles
- solar neutrons**  
GS extraterrestrial radiation  
. solar radiation  
. . solar corpuscular radiation  
. . . **solar neutrons** particles  
. corpuscular radiation  
. . solar corpuscular radiation  
. . . **solar neutrons**  
. elementary particles  
. . fermions  
. . . neutrons  
. . . . **solar neutrons**  
. neutral particles  
. . neutrons  
. . . **solar neutrons**  
RT neutron flux density  
solar flares
- solar noise*  
USE **solar radio emission**
- solar oblateness**  
RT oblate spheroids  
sun
- solar observatories**  
GS observatories  
. astronomical observatories  
. . **solar observatories**  
. . . OSO  
. . . . AOSO  
. . . . OSO-1  
. . . . OSO-2  
. . . . OSO-3  
. . . . OSO-4  
. . . . OSO-5  
. . . . OSO-6  
. . . . OSO-7  
. . . . OSO-8  
. . . . OSO-C  
. . . Pinhole Occulter Facility  
. . . STEREO (observatory)  
RT coronagraphs  
SOHO Mission  
sun  
Transition Region and Coronal Explorer
- solar optical telescope**  
DEF A 1-M class, high resolution solar telescope which NASA had planned to operate on the Shuttle Spacelab during the mid and late 1980s. Used for SOT.  
UF SOT  
GS telescopes  
. spaceborne telescopes  
. . **solar optical telescope**  
RT solar instruments
- solar physics
- solar orbits**  
SN (RESTRICTED TO ORBITS AROUND THE SUN)  
UF *heliocentric orbits*  
*planetary motion*  
GS orbits  
. **solar orbits**  
RT aphelions  
circular orbits  
∞ Earth motion  
ecliptic  
elliptical orbits  
HEOS satellites  
interplanetary trajectories  
∞ motion  
orbital resonances (celestial mechanics)  
perihelions  
protoplanets  
spacecraft orbits  
sun  
transfer orbits
- solar oscillations**  
DEF Irregular oscillations in the solar atmosphere.  
GS oscillations  
. stellar oscillations  
. . **solar oscillations** stellar motions  
. stellar oscillations  
. . **solar oscillations**  
RT astronomical models  
atmospheric models  
cataclysmic variables  
solar activity effects  
solar atmosphere  
stellar models  
sun  
variable stars
- solar parallax**  
DEF The angle at the sun subtended by the equatorial diameter of the Earth.  
GS parallax  
. **solar parallax**  
RT astronomy  
stellar parallax  
sun
- solar physics**  
DEF The study of the structure and activities of the Sun.  
GS astrophysics  
. stellar physics  
. . **solar physics**  
RT filtergrams  
helioseismology  
International Quiet Sun Year  
photosphere  
∞ physics  
plasmas (physics)  
∞ science  
solar convection (astronomy)  
solar interior  
solar optical telescope  
Spartan satellites  
sun  
Transition Region and Coronal Explorer
- solar planetary interactions**  
DEF The interactions and subsequent effects caused by the interactions of solar activity and/or wind with a planet, its magnetic field, its atmosphere, or natural satellites.  
GS **solar planetary interactions**  
. solar terrestrial interactions  
RT Earth magnetosphere  
magnetic disturbances  
magnetosheath  
Nozomi Mars Orbiter  
planetary atmospheres  
planetary magnetic fields  
planetary magnetospheres  
planetary magnetotails  
plasma interactions  
solar activity
- solar activity effects  
solar corpuscular radiation  
solar wind  
solar wind velocity
- solar plasma (radiation)*  
USE **solar wind**
- solar ponds (heat storage)**  
DEF Large, shallow ponds covered with thin, transparent plastic shields and used for collecting and storing solar heat for conversion to electric power.  
RT electric generators  
energy conversion  
ponds  
reservoirs  
sun
- solar position**  
UF *solar azimuth*  
GS position (location)  
. **solar position**  
RT astrolabes  
celestial navigation  
equinoxes  
seasons  
solstices  
sun  
zenith
- solar power generation*  
USE **solar generators**
- solar power satellites**  
DEF Proposed very large space structures consisting of hundreds of square miles of solar thermal collectors and/or photovoltaic converters constructed or assembled in space. Power would be transmitted to Earth in microwave form.  
GS artificial satellites  
. **solar power satellites**  
RT large space structures  
power beaming  
satellite power transmission  
sun
- solar power sources*  
USE **solar generators**
- solar powered aircraft**  
DEF Aircraft powered by solar energy.  
RT ∞ aircraft  
solar cells  
solar electric propulsion  
solar propulsion  
sun
- solar probes**  
GS unmanned spacecraft  
. space probes  
. . **solar probes**  
. . . Helios 1  
. . . Helios 2  
. . . Helios A  
. . . Helios B  
. . . Starprobe spacecraft  
. . . Sunblazer space probe  
RT Helios Project  
Pioneer space probes  
sun  
Ulysses mission
- solar prominences**  
DEF Filamentlike protuberances from the chromosphere of the sun. Used for filaments (solar physics).  
UF *filaments (solar physics)*  
GS prominences  
. **solar prominences**  
stellar activity  
. solar activity  
. . **solar prominences**  
RT chromosphere  
sun
- solar propulsion**  
GS propulsion  
. low thrust propulsion



- sun
- solar rotation**
  - UF *Carrington rotation*
  - GS gyration
    - . rotation
    - . . stellar rotation
    - . . . **solar rotation**
  - stellar motions
    - . stellar rotation
    - . . **solar rotation**
  - RT sun
    - twenty-seven day variation
- solar sails**
  - GS sails
    - . **solar sails**
  - RT propulsion
    - space flight
    - spacecraft propulsion
    - sun
- solar sea power plants**
  - GS electric generators
    - . direct power generators
    - . . thermoelectric generators
    - . . . **solar sea power plants**
  - RT electric power plants
    - energy conversion
      - ∞ generators
      - ocean temperature
      - ocean thermal energy conversion
    - ∞ power plants
      - solar generators
      - sun
- solar seismology*
  - USE **helioseismology**
- solar selective coatings*
  - USE **selective surfaces**
- solar sensors**
  - UF *sun sensors*
  - RT attitude control
    - guidance sensors
    - IRIS satellites
    - navigation aids
    - navigation instruments
    - star trackers
    - sun
    - tracking (position)
- solar simulation**
  - GS simulation
    - . **solar simulation**
  - RT space environment simulation
    - sun
    - thermal simulation
- solar simulators**
  - DEF Devices which produce thermal energy, equivalent in intensity and spectral distribution to that from the sun, used in testing materials and space vehicles.
  - GS simulators
    - . environment simulators
    - . . **solar simulators**
  - RT space simulators
    - sun
    - test facilities
- solar spectra**
  - GS spectra
    - . radiation spectra
    - . . electromagnetic spectra
    - . . . stellar spectra
    - . . . . **solar spectra**
  - RT absorption spectra
    - astronomical spectroscopy
    - continuous spectra
    - coronas
    - D lines
    - emission spectra
    - filtergrams
    - Fraunhofer lines
    - H alpha line
    - H beta line
    - H gamma line
    - H lines
- infrared spectra
- line spectra
- Lyman spectra
- molecular spectra
- oxygen spectra
- sun
- ultraviolet spectra
- visible spectrum
- x ray spectra
- solar spectrometers**
  - GS measuring instruments
    - . radiation measuring instruments
    - . . actinometers
    - . . . **solar spectrometers**
    - . . . spectrometers
    - . . . **solar spectrometers**
  - RT absorption spectra
    - emission spectra
    - filter wheel infrared spectrometers
    - infrared spectrometers
    - spectroheliographs
    - sun
    - ultraviolet spectrometers
- solar storms**
  - GS stellar activity
    - . solar activity
    - . . **solar storms**
    - storms
    - . **solar storms**
  - RT Forbush decreases
    - ionospheric storms
    - magnetic storms
    - noise storms
    - sun
- solar streams*
  - USE **solar corpuscular radiation**
- solar system**
  - DEF The sun and other celestial bodies within its gravitational influence, including planets, asteroids, satellites, comets, and meteors.
  - GS celestial bodies
    - . **solar system**
    - planetary systems
    - . **solar system**
  - RT Amalthea
    - Amor asteroid
    - Apollo asteroids
    - Arend-Roland comet
    - asteroid belts
    - asteroid capture
    - asteroids
    - Brorsen-Metcalf comet
    - celestial mechanics
    - Charon
    - Chiron
    - comet heads
    - comet nuclei
    - comet tails
    - comets
    - Earth-Moon system
    - gas giant planets
    - Giacobini-Zinner comet
    - Grigg-Skjellerup comet
    - Halley's comet
    - Humason comet
    - IRAS-Araki-Alcock comet
    - Jupiter satellites
    - Kohoutek comet
    - Kuiper belt
    - Mercury surface
    - meteoroids
    - Morehouse comet
    - Mrkos comet
    - natural satellites
    - Oort cloud
    - planetary geology
    - planets
    - protoplanets
    - Quaoar
    - Rhea (astronomy)
    - Saturn rings
    - Schwassmann-Wachmann comet
    - solar nebula
    - solar neighborhood
    - solar system evolution
    - sun
- solar system evolution**
  - (added January 1991)
  - DEF The origin and development of the solar system.
  - GS evolution (development)
    - . **solar system evolution**
  - RT Genesis mission
    - Kuiper belt
    - lunar evolution
    - planetary evolution
    - planetary systems
    - planets
    - protoplanetary disks
    - solar nebula
    - solar system
    - stellar evolution
    - sun
- solar temperature**
  - GS temperature
    - . **solar temperature**
  - RT solar transition region
    - sun
- solar terrestrial interactions**
  - GS solar planetary interactions
    - . **solar terrestrial interactions**
  - RT Cluster Mission
    - corpuscular radiation
    - Earth magnetosphere
  - ∞ flares
    - ∞ interactions
      - International Geosphere-Biosphere program
      - magnetic disturbances
      - magnetic storms
      - magnetosheath
      - Polar/GGS spacecraft
      - space weather
      - STEREO (observatory)
      - storms
      - sun
      - sunspots
      - weather
      - Wind/GGS spacecraft
- Solar Terrestrial Relations Observatory*
  - (added July 2007)
  - USE **STEREO (observatory)**
- solar thermal electric power plants**
  - DEF The use of solar energy to generate steam for producing electricity.
  - GS electric power plants
    - . **solar thermal electric power plants**
  - RT photothermal conversion
    - ∞ power plants
      - solar dynamic power systems
      - thermal energy
- solar thermal propulsion**
  - DEF Proposed energy source for spacecraft propulsion by passing hydrogen through a heat exchanger placed at the focal point of a large parabolic dish solar concentrator mirror.
  - GS propulsion
    - . low thrust propulsion
    - . . solar propulsion
    - . . . **solar thermal propulsion**
    - . spacecraft propulsion
    - . . solar propulsion
    - . . . **solar thermal propulsion**
  - RT propulsion system performance
    - solar electric propulsion
    - sun
- solar total energy systems**
  - DEF Systems for converting solar energy directly into electrical and thermal energy.
- ∞ systems
  - Tempel 2 comet
  - terrestrial planets
  - Toro asteroid
  - trans-Neptunian objects
  - Venus surface
  - Vesta asteroid
  - Voyager 1977 mission
  - West comet

## solar transition region

- GS energy conversion
  - . solar energy conversion
  - . . **solar total energy systems**
- total energy systems
  - . **solar total energy systems**
- RT ∞ conversion
  - direct power generators
- ∞ energy
  - sun
- ∞ systems

### solar transition region

(added September 1993)

DEF A layer of the solar atmosphere only a few hundred miles thick between the chromosphere and the corona across which the temperature rises rapidly from a few times 10(exp 4) K to the order of 10(exp 6) K.

- GS environments
  - . extraterrestrial environments
  - . . stellar atmospheres
  - . . . solar atmosphere
  - . . . . **solar transition region**

- RT chromosphere
- solar corona
- solar temperature
- Transition Region and Coronal Explorer

### solar velocity

- GS rates (per time)
  - . **solar velocity**
- velocity
  - . **solar velocity**
- RT sun

### solar wind

DEF Streams of plasma flowing approximately radially outward from the sun. Used for solar plasma (radiation).

UF *solar plasma (radiation)*

- GS extraterrestrial radiation
  - . solar radiation
  - . . **solar wind**
- particles
  - . charged particles
  - . . energetic particles
  - . . . plasmas (physics)
  - . . . . space plasmas
  - . . . . . **solar wind**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . space plasmas
- . . . . . **solar wind**

- RT Advanced Composition Explorer
- AMPTE (satellites)
- Chapman-Ferraro problem
- Cluster Mission
- comet tails
- coronal holes
- coronal mass ejection
- cosmic plasma
- galactic cosmic rays
- Genesis mission
- Grigg-Skjellerup comet
- heliosphere
- hydrogen plasma
- interplanetary gas
- interplanetary medium
- interplanetary shock waves
- M region
- magnetic clouds
- magnetic sails
- magnetopause
- magnetosheath
- planetary magnetotails
- plasmopause
- Polar/GGS spacecraft
- ∞ radiation
- radiation pressure
- SOHO Mission
- solar planetary interactions
- stellar winds
- sun
- Wind/GGS spacecraft

### solar wind velocity

- GS dynamic characteristics
  - . flow characteristics

- . . flow velocity
  - . . . **solar wind velocity**
- rates (per time)
  - . flow velocity
  - . . **solar wind velocity**
- . wind velocity
  - . . **solar wind velocity**
- velocity
  - . flow velocity
  - . . **solar wind velocity**
- . wind velocity
  - . . **solar wind velocity**
- RT alpha particles
- Earth magnetosphere
- magnetic disturbances
- magnetohydrodynamic flow
- solar planetary interactions
- stellar winds
- sun
- velocity measurement

### solar x-rays

- GS electromagnetic radiation
  - . x rays
  - . . **solar x-rays**
- extraterrestrial radiation
  - . solar radiation
  - . . **solar x-rays**
- ionizing radiation
  - . x rays
  - . . **solar x-rays**
- RT coronal holes
- sun

### solar-pumped lasers

- UF *solar lasers*
- GS stimulated emission devices
  - . lasers
  - . . **solar-pumped lasers**
- RT laser pumping
- optical pumping
- solar energy conversion
- solar radiation

### soldered joints

- GS joints (junctions)
  - . metal joints
  - . . **soldered joints**
- RT beam leads
- bonded joints
- butt joints
- lap joints
- soldering

### soldering

- GS **soldering**
  - . ultrasonic soldering
- RT bonding
- brazing
- fluxes
- heat affected zone
- ∞ joining
- laser welding
- low temperature brazing
- metal bonding
- metal-metal bonding
- sealing
- soldered joints
- solders
- welding

### solders

- GS alloys
  - . **solders**
- RT lead alloys
- sealers
- soldering
- tin alloys
- zinc alloys

### solenoid valves

- GS valves
  - . **solenoid valves**
- RT automatic control valves
- electric control
- ∞ electric equipment
  - electric relays
  - electric switches
  - hydraulic control
  - off-on control

solenoids

### solenoids

- SN (EXCLUDES METEOROLOGICAL SOLENOIDS)
- RT actuators
- electric relays
- electromagnets
- magnet coils
- solenoid valves
- toroidal plasmas

### solettas

- DEF Orbiting solar mirrors (reflectors).
- GS mirrors
  - . **solettas**
- reflectors
  - . solar reflectors
  - . . **solettas**
- RT ∞ platforms
- ∞ spacecraft

### sol-gel processes

- RT alkoxides
- ceramic nuclear fuels
- nuclear fuels
- ∞ processes
- xerogels

*solid argon*

USE **solidified gases**

### solid cryogen cooling

- DEF Cooling with solidified cryogenic fluids.
- GS cooling
  - . **solid cryogen cooling**
- RT cryogenic fluids
- cryogenics
- liquefied gases

### solid cryogenics

- DEF Solidified cryogenic fluids.
- GS gases
  - . solidified gases
  - . . **solid cryogenics**
  - . . . solid nitrogen
- solids
  - . solidified gases
  - . . **solid cryogenics**
  - . . . solid nitrogen
- RT cooling systems
- cryogenic equipment
- cryogenics
- liquid nitrogen

### solid electrodes

- GS electrodes
  - . **solid electrodes**
- RT transconductance

### solid electrolytes

- DEF Single crystals, certain alloys, alkaline metals, and other compact compounds used in galvanic cells (batteries).
- GS conductors
  - . electrolytes
  - . . **solid electrolytes**
- RT solid oxide fuel cells

### solid lubricants

- SN (EXCLUDES SEMISOLIDS SUCH AS GREASES)
- GS lubricants
  - . **solid lubricants**
- RT binders (materials)
- gas lubricants
- graphite
- self lubricating materials

### solid mechanics

- GS mechanics (physics)
  - . **solid mechanics**
  - . . fracture mechanics
- RT computational mechanics
- continuum mechanics
- finite element method
- mechanical properties
- meshfree methods
- ∞ science
- solids

structural analysis

**solid nitrogen**

GS chemical elements  
 . nitrogen  
 . . **solid nitrogen**  
 gases  
 . nitrogen  
 . . **solid nitrogen**  
 . solidified gases  
 . . solid cryogenes  
 . . . **solid nitrogen**  
 solids  
 . solidified gases  
 . . solid cryogenes  
 . . . **solid nitrogen**

RT cryogenics  
 refrigerants

**solid oxide fuel cells**  
*(added December 1995)*

GS electric generators  
 . direct power generators  
 . . fuel cells  
 . . . **solid oxide fuel cells**  
 electrochemical cells  
 . fuel cells  
 . . **solid oxide fuel cells**

RT oxides  
 solid electrolytes

**solid phases**

GS **solid phases**  
 . Laves phases

RT eutectics  
 gas-metal interactions  
 gas-solid interfaces  
 liquid phases  
 liquid-solid interfaces  
 liquidus  
 metallic hydrogen  
 phase diagrams  
 phase separation (materials)  
 ∞ phases  
 solidified gases  
 solidus  
 syntectic alloys

**solid propellant combustion**

DEF The burning of solid propellants by rapid oxidation and production of expanding gases, heat, and light.

GS combustion  
 . propellant combustion  
 . . **solid propellant combustion**  
 . . . solid propellant ignition

RT burning rate  
 combustion stability  
 erosive burning  
 fuel combustion  
 heat generation  
 metal combustion  
 propellant chemistry  
 propellant consumption

**solid propellant ignition**

GS combustion  
 . propellant combustion  
 . . solid propellant combustion  
 . . . **solid propellant ignition**  
 ignition  
 . **solid propellant ignition**

RT hybrid propellants  
 hypergolic rocket propellants  
 igniters  
 ignition temperature  
 inhibitors  
 metal combustion  
 pyrophoric materials  
 squibs

**solid propellant rocket engines**

DEF Rocket engines fueled with solid propellants. Such motors consist essentially of a combustion chamber containing the propellant, and a nozzle for the exhaust jet, although they often contain other components, such as grids or liners.

GS engines  
 . rocket engines

. . **solid propellant rocket engines**

. . . Algol engine  
 . . . apogee boost motors  
 . . . ASROC engine  
 . . . Hercules engine  
 . . . M-46 engine  
 . . . M-55 engine  
 . . . M-56 engine  
 . . . M-57 engine  
 . . . Nike booster rocket engines  
 . . . P-1 engine  
 . . . SL-3 rocket engine  
 . . . Space Shuttle Boosters  
 . . . . Advanced Solid Rocket Motor (STS)  
 . . . SYNCOM apogee engines  
 . . . TX-77 engine  
 . . . TX-354 engine  
 . . . X-248 engine  
 . . . X-254 engine  
 . . . X-258 engines  
 . . . . X-258-B1 engine  
 . . . X-259 engine  
 . . . XM-33 engine

RT air slew missiles  
 Antares rocket vehicle  
 Arcas rocket vehicles  
 Argo rocket vehicles  
 Astrobee 1500 rocket vehicle  
 Astrobee rocket vehicles  
 Athena rocket vehicle  
 BE-3 engine  
 Berenice rocket vehicle  
 Black Brant 1 sounding rocket  
 Black Brant 2 sounding rocket  
 Black Brant 3 sounding rocket  
 Black Brant 4 sounding rocket  
 Black Brant 5 sounding rocket  
 Black Brant sounding rockets  
 Blue Goose missile  
 Blue Scout rocket vehicle  
 BOMARC A missile  
 BOMARC B missile  
 bonded joints  
 booster rocket engines  
 burning rate  
 burnout  
 Cajun rocket vehicle  
 Diamant launch vehicle  
 ducted rocket engines  
 EXOS sounding rocket  
 Falcon missile  
 Folding Fin aircraft rocket vehicle  
 Genie rocket vehicle  
 Hawk missile  
 Honest John rocket vehicle  
 hybrid propellant rocket engines  
 ∞ hybrid rocket engines  
 integral rocket ramjets  
 internal combustion engines  
 Jaguar rocket vehicle  
 JATO engines  
 Javelin rocket vehicle  
 Juno 1 launch vehicle  
 Juno 2 launch vehicle  
 Juno launch vehicles  
 Jupiter C rocket vehicle  
 Kappa 8 rocket vehicle  
 Kappa 9 rocket vehicle  
 Kappa rocket vehicles  
 Lambda rocket vehicles  
 liquid propellant rocket engines  
 Little Joe 2 launch vehicle  
 Little John rocket vehicle  
 Loki rocket vehicle  
 Mace missiles  
 Matra missile  
 Mauler missile  
 Meteor 1 rocket vehicle  
 Minuteman ICBM  
 Nike-Ajax missile  
 Nike-Apache rocket vehicle  
 Nike-Cajun rocket vehicle  
 Nike-Hercules missile  
 Nike-Javelin rocket vehicle  
 Nike-Tomahawk rocket vehicle  
 Nike-Zeus missile  
 Pershing missile  
 Phoenix sounding rocket

polaris missiles  
 RAM B launch vehicle  
 Redeye missile  
 Regulus missile  
 restartable rocket engines  
 retrorocket engines  
 Rubis rocket vehicle  
 Scout launch vehicle  
 sergeant missiles  
 Shrike missile  
 Skua rocket vehicles  
 Skybolt missile  
 Skylark rocket vehicle  
 Space Shuttle upper stage D  
 Sparrow 2 missile  
 Sparrow missiles  
 Sprint missile  
 SS-11 missile  
 Sunblazer space probe  
 sustainer rocket engines  
 Talos missile  
 tartar missile  
 terrier missile  
 Thor Able rocket vehicle  
 Thor Delta launch vehicle  
 Thor launch vehicles  
 Titan launch vehicles  
 Trailblazer 1 reentry vehicle  
 Trailblazer 2 reentry vehicle  
 ullage rocket engines  
 vanguard 2 launch vehicle  
 Vernier engines  
 WASP sounding rocket  
 X-17 reentry vehicle  
 Zuni rocket vehicle

**solid propellants**

DEF Specifically, a rocket propellant in the solid form, usually containing both fuel and oxidizer combined or mixed, and formed into a monolithic (not powdered or granulated) grain.

GS propellants  
 . **solid propellants**  
 . . case bonded propellants  
 . . composite propellants  
 . . nitramine propellants  
 . . plastic propellants  
 . . solid rocket propellants  
 . . . double base rocket propellants  
 . . . HMX  
 . . . HTPB propellants  
 . . . metal propellants

RT aircraft fuels  
 chemical fuels  
 colloidal propellants  
 gelled propellants  
 high temperature propellants  
 hybrid propellants  
 inhibitors  
 metal fuels  
 nitroguanidine  
 plasticizers  
 propellant binders  
 propellant grains  
 RDX  
 rocket propellants  
 storable propellants

**solid rocket binders**

GS additives  
 . propellant additives  
 . . propellant binders  
 . . . **solid rocket binders**  
 binders (materials)  
 . propellant binders  
 . . **solid rocket binders**

RT glycidyl azide polymer  
 plasticizers

*Solid Rocket Boosters (Space Shuttle)*  
 USE **Space Shuttle Boosters**

**solid rocket propellants**

GS propellants  
 . rocket propellants  
 . . **solid rocket propellants**  
 . . . double base rocket propellants  
 . . . HMX  
 . . . HTPB propellants  
 . . . metal propellants

## solid solutions

- . solid propellants
- .. **solid rocket propellants**
- ... double base rocket propellants
- ... HMX
- ... HTPB propellants
- ... metal propellants
- RT ammonium perchlorates
- burning rate
- case bonded propellants
- composite propellants
- Domino propellants
- gelled rocket propellants
- hybrid propellants
- liquid rocket propellants
- monopropellants
- potassium perchlorates
- propellant grains
- RDX
- rocket engines
- slurry propellants

### solid rotation

USE **rotating bodies**

### solid solutions

- GS mixtures
- . solutions
- .. **solid solutions**
- solids
- .. **solid solutions**
- RT aging (metallurgy)
- alloying
- alloys
- antiphase boundaries
- cluster variation method
- liquid phases
- liquidus
- melting points
- order-disorder transformations
- Ostwald ripening
- phase diagrams
- precipitation hardening
- supersaturation
- ternary systems

### solid state

- RT crystallization
- energy gaps (solid state)
- melting points
- metallic hydrogen
- solids

### solid state devices

DEF Devices which utilize the electric, magnetic, and photic properties of the solid materials, e.g., binary magnetic cores or transistors.

- GS electronic equipment
- . **solid state devices**
- .. cryotrons
- .. crystal rectifiers
- .. metal-nitride-oxide-semiconductors
- .. multispectral linear arrays
- .. semiconductor devices
- ... avalanche diodes
- ... cryosar
- ... Barritt diodes
- ... charge transfer devices
- ... bucket brigade devices
- ... charge coupled devices
- ... charge injection devices
- ... germanium diodes
- ... heterojunction devices
- ... high electron mobility transistors
- ... MODFETS
- ... junction diodes
- ... MIM diodes
- ... step recovery diodes
- ... light emitting diodes
- ... metal oxide semiconductors
- ... CMOS
- ... ITO (semiconductors)
- ... SOS (semiconductors)
- ... MIM (semiconductors)
- ... MIS (semiconductors)
- ... MOM (semiconductors)
- ... MSM (semiconductors)
- ... NDM semiconductor devices
- ... neuristors
- ... parametric diodes
- ... photodiodes

- ... photovoltaic cells
- ... solar cells
- ... vertical junction solar cells
- ... Schottky diodes
- ... semiconductor lasers
- ... aluminum gallium arsenide lasers
- ... gallium arsenide lasers
- ... quantum cascade lasers
- ... quantum well lasers
- ... YLF lasers
- ... SOI (semiconductors)
- ... thermistors
- ... thyristors
- ... silicon controlled rectifiers
- ... transferred electron devices
- ... transistor amplifiers
- ... transistors
- ... bipolar transistors
- ... field effect transistors
- ... charge flow devices
- ... JFET
- ... MODFETS
- ... high electron mobility transistors
- ... MODFETS
- ... junction transistors
- ... JFET
- ... phototransistors
- ... silicon transistors
- ... SOS (semiconductors)
- ... single electron transistors
- ... cascode devices
- ... quantum well infrared photodetectors
- ... resonant tunneling diodes
- ... TRAPATT devices
- ... varactor diodes
- ... varistors
- ... SIS (semiconductors)
- ... SIS (superconductors)
- ... solid state lasers
- ... aluminum gallium arsenide lasers
- ... DBR lasers
- ... fiber lasers
- ... gallium arsenide lasers
- ... quantum cascade lasers
- ... quantum well lasers
- ... ruby lasers
- ... YAG lasers
- ... YLF lasers

RT

- amplifiers
- bubble technique
- capacitors
- circuits
- ∞ devices
- electric bridges
- laser cavities
- lasers
- MBM junctions
- miniature electronic equipment
- oscillators
- photomasks
- rectifiers
- resistors
- signal generators
- superconductors (materials)
- thin films
- threshold voltage
- transformers
- wafers

### solid state lasers

- GS electronic equipment
- . solid state devices
- .. **solid state lasers**
- ... aluminum gallium arsenide lasers
- ... DBR lasers
- ... fiber lasers
- ... gallium arsenide lasers
- ... quantum cascade lasers
- ... quantum well lasers
- ... ruby lasers
- ... YAG lasers
- ... YLF lasers
- stimulated emission devices
- . lasers
- .. **solid state lasers**
- ... aluminum gallium arsenide lasers
- ... DBR lasers

- ... fiber lasers
- ... gallium arsenide lasers
- ... quantum cascade lasers
- ... quantum well lasers
- ... ruby lasers
- ... YAG lasers
- ... YLF lasers

RT

- continuous wave lasers
- distributed feedback lasers
- infrared lasers
- laser cavities
- Q switched lasers
- semiconductor lasers
- surface emitting lasers

### ∞ solid state physics

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF The study of the physical structure and properties of solid matter, including electrical conduction in metal crystals and semiconductors, superconductivity, and photoconductivity.

RT condensed matter physics

- crystallography
- electrical properties
- electron mobility
- energy gaps (solid state)
- forbidden transitions
- hole mobility
- magnetic properties
- optical properties
- ∞ physics
- quantum electronics
- resonant tunneling diodes
- ∞ science
- semiconductors (materials)
- superconductivity
- theoretical physics
- thin films
- transport properties

### solid surfaces

GS **solid surfaces**

- . crystal surfaces
- RT liquid surfaces
- metal surfaces
- surface cracks
- surface finishing
- surface properties
- ∞ surfaces

### solid suspensions

GS mixtures

- . **solid suspensions**
- RT colloidal propellants
- composite materials
- metallography
- particulates
- phase diagrams
- ∞ suspensions

### solid wastes

GS wastes

- . **solid wastes**
- RT composting
- garbage
- human wastes
- industrial wastes
- landfills
- liquid wastes
- metabolic wastes
- pollution
- radioactive wastes
- residues
- sewage
- sludge
- waste disposal
- waste energy utilization
- waste utilization

### solidification

UF *rapid solidification*

GS **solidification**

- . directional solidification (crystals)
- . melt spinning
- RT casting
- castings
- coagulation
- crystallization

- freezing  
gelation  
ingots  
melting points  
mushy zones  
occlusion  
Ostwald ripening  
phase transformations  
rheocasting  
∞ setting  
∞ solidified gases  
transition temperature  
vitrification
- solidified gases**  
UF *solid argon*  
GS gases  
. **solidified gases**  
. . . solid cryogenes  
. . . solid nitrogen  
solids  
. **solidified gases**  
. . . solid cryogenes  
. . . solid nitrogen  
RT cryogenic fluids  
cryogenic temperature  
cryogenics  
freezing  
low temperature physics  
melting points  
metallic hydrogen  
solid phases  
solidification
- solids**  
GS **solids**  
. organic solids  
. solid solutions  
. solidified gases  
. . . solid cryogenes  
. . . solid nitrogen  
RT ∞ bodies  
∞ fluids  
∞ materials  
metallic hydrogen  
phase transformations  
semisolids  
solid mechanics  
solid state  
thermochromatic materials  
vapor phases
- solids flow**  
GS fluid flow  
. **solids flow**  
RT ∞ flow  
flow measurement  
flow theory  
mass flow  
multiphase flow  
particle size distribution  
steady flow  
two phase flow  
uniform flow  
unsteady flow
- solid-solid interfaces**  
GS interfaces  
. **solid-solid interfaces**  
RT antiphase boundaries  
gas-solid interfaces  
liquid-solid interfaces  
surface properties
- solidus**  
RT binary systems (materials)  
liquid phases  
liquidus  
solid phases
- solisons**  
RT circuits  
diodes  
integrators  
ion currents
- solitary waves**  
DEF Nonlinear waves capable of propagation without spreading out, breaking up, or dissipating their strength over distance. Used for Solitrons.  
UF *solitons*  
GS traveling waves  
. **solitary waves**  
RT backward waves  
cnoidal waves  
elastic waves  
electromagnetic radiation  
plane waves  
pulses  
radio waves  
rates (per time)  
velocity
- solithanes**  
RT elastomers  
∞ polymers  
synthetic rubbers
- solitons*  
USE **solitary waves**
- Solomon computers**  
GS data processing equipment  
. computers  
. . . digital computers  
. . . **Solomon computers**
- Solrad 10 satellite*  
USE **Explorer 44 satellite**
- solstices**  
DEF The two points of the ecliptic farthest from the celestial equator; two points on the celestial sphere occupied by the sun at maximum declination.  
RT equinoxes  
seasons  
solar position  
summer  
winter
- solubility**  
UF *immiscibility*  
*miscibility*  
RT clarity  
concentration (composition)  
diffusivity  
dissolved gases  
dissolving  
gas-solid interfaces  
Henry law  
hydrophobicity  
hygroscopicity  
incompatibility  
liquid phases  
liquid-gas mixtures  
liquid-liquid interfaces  
liquid-vapor interfaces  
miscibility gap  
mixtures  
phase diagrams  
phase separation (materials)  
precipitation (chemistry)  
solutions  
supercritical fluids  
thermodynamic properties  
thixotropy  
turbidity  
viscosity
- solutes**  
RT dissolved organic matter  
dissolving  
solutions
- ∞ **solution**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT dissolving  
problem solving  
solutions
- solutions**  
GS mixtures  
. **solutions**  
. . . aqueous solutions  
. . . gas mixtures  
. . . air
- . . . . alveolar air  
. . . . compressed air  
. . . . expired air  
. . . . high temperature air  
. . . . liquid air  
. . . . detonable gas mixtures  
. . . . photographic emulsions  
. . . . nuclear emulsions  
. . . . solid solutions  
RT azeotropes  
composition (property)  
dissolved gases  
emulsions  
eutectics  
Henry law  
Raoult law  
solubility  
solutes  
∞ solution  
solvents  
titration
- solvation**  
DEF The process of swelling, getting, or dissolving of a material by a solvent; for resins, the solvent can be plasticized.  
RT aqueous solutions  
chemical reactions  
reaction kinetics  
solvents
- solvent extraction**  
GS extraction  
. **solvent extraction**  
RT ion extraction  
purification  
∞ separation
- solvent refined coal**  
DEF Low-sulfur distillate fuels from coal, plus the byproducts of methane, light hydrocarbons, and naphtha, all useful for making pipeline gas, ethylene, and high-octane unleaded gasoline.  
GS fuels  
. chemical fuels  
. . . hydrocarbon fuels  
. . . fossil fuels  
. . . . coal  
. . . . **solvent refined coal**  
resources  
. Earth resources  
. fossil fuels  
. . . coal  
. . . . **solvent refined coal**  
rocks  
. sedimentary rocks  
. carbonaceous rocks  
. . . coal  
. . . . **solvent refined coal**  
RT benzene  
bitumens  
carbonaceous materials  
coal liquefaction  
coal utilization  
fractionation  
fuel oils  
gasoline  
hydrocarbon fuel production  
methane  
product development
- solvent retention**  
DEF The occurrence of solvent residues in chemical or material end products or intermediates.  
RT dissolving  
solvents
- solvents**  
DEF The liquid part of an aerosol formulation used to dissolve solid or other liquid parts. Used for thinners.  
UF *thinners*  
GS **solvents**  
. tetrahydrofuran  
. turpentine  
RT additives  
coatings  
dilutents



## solvolysis

dissolving  
extraction  
furans  
paint removal  
solutions  
solvation  
solvent retention  
solvolysis  
toluene  
triacetin  
trichloroethylene

### solvolysis

GS reclamation  
. materials recovery  
. . **solvolysis**  
RT recycling  
solvents

### Somalia

GS nations  
. **Somalia**  
RT Africa

### Sommerfeld approximation

GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **Sommerfeld approximation**  
RT antenna radiation patterns  
directional antennas  
electromagnetic fields  
radio transmission

### Sommerfeld waves

GS electromagnetic radiation  
. **Sommerfeld waves**  
surface waves  
. **Sommerfeld waves**  
RT dielectric properties  
electric conductors

### sonar

DEF A method or system, analogous to radar used under water, in which high frequency sound waves are emitted so as to be reflected back from objects, and used to detect the objects of interest. Called asdic by the British. (From SOund, NAvigation, and Ranging.)

GS **sonar**  
. sonobuoys  
RT distance measuring equipment  
echo sounding  
echo suppressors  
hydrophones  
LOFAR  
navigation aids  
sound localization  
sound ranging  
ultrasonic wave transducers  
underwater acoustics  
underwater communication

### sondes

UF *meteorological probes*  
GS measuring instruments  
. **sondes**  
. . dropsondes  
. . Judi-Dart rocket  
. . radiosondes  
. . . ionosondes  
. . . rawinsondes  
. . ozonesondes  
RT Apache rocket vehicle  
Cajun rocket vehicle  
 $\infty$  probes  
sounding  
sounding rockets

### sonic anemometers

GS measuring instruments  
. anemometers  
. . **sonic anemometers**  
RT acoustics  
flowmeters  
hot-film anemometers  
velocity measurement

### sonic booms

DEF Noises created by shock waves that

emanate from aircraft or other objects traveling at or above sonic velocity.

GS elastic waves  
. shock waves  
. . **sonic booms**  
. sound waves  
. . noise (sound)  
. . . aircraft noise  
. . . . **sonic booms**  
RT acoustic velocity  
aerodynamic noise  
 $\infty$  boom  
caustic lines  
jet aircraft noise  
supersonic flight  
transonic flight

### sonic fatigue

USE **acoustic fatigue**

### sonic flow

USE **transonic flow**

### sonic nozzles

RT acoustic nozzles  
conical nozzles  
 $\infty$  nozzles  
supersonic nozzles  
transonic flow  
transonic nozzles

### sonic soldering

USE **ultrasonic soldering**

### sonic speed

USE **acoustic velocity**

### sonic waveguides

USE **acoustic delay lines**

### sonobuoys

GS radio equipment  
. radio transmitters  
. . **sonobuoys**  
sonar  
. **sonobuoys**  
transmitters  
. radio transmitters  
. . **sonobuoys**  
RT antisubmarine warfare  
hydrophones  
underwater acoustics  
underwater communication

### sonochemistry

(added June 1998)  
USE **ultrasonic processing**

### sonograms

RT recording instruments  
sound waves  
whistler recorders  
whistlers

### sonoholography

USE **acoustical holography**

### sonoluminescence

GS emission  
. light emission  
. . luminescence  
. . . **sonoluminescence**

### soot

GS carbonaceous materials  
. **soot**  
particles  
. particulates  
. . **soot**  
products  
. reaction products  
. . combustion products  
. . . **soot**  
RT air pollution  
carbon  
fire damage  
Glory Mission satellite  
smoke

smoke abatement

### sorbates

DEF Gas taken up by sorbents.  
RT sorbents  
sorption

### sorbents

DEF The materials which take up gas by sorption.  
GS **sorbents**  
. adsorbents  
. adsorbents  
RT sorbates  
sorption

### Soret coefficient

GS coefficients  
. diffusion coefficient  
. . **Soret coefficient**  
transport properties  
. diffusion coefficient  
. . **Soret coefficient**  
RT liquid flow  
thermal diffusion

### sorghum

DEF Any of a number of related cereal grasses with sweet juicy stalks cultivated as farm crops for grain, fodder, syrup, etc.

GS farm crops  
. grains (food)  
. . **sorghum**  
plants (botany)  
. grasses  
. . **sorghum**  
RT agriculture  
crop identification  
 $\infty$  crops  
Earth resources

### sorption

DEF The taking up of gas by absorption, adsorption, chemisorption, or any combination of these processes. Used for cryosorption.

UF *cryosorption*  
GS **sorption**  
. adsorption  
. . chemisorption  
RT  $\infty$  absorption  
bioavailability  
chromatography  
concentrating  
extraction  
gas chromatography  
hydrophobicity  
liquid chromatography  
material absorption  
permeating  
 $\infty$  separation  
sorbates  
sorbents  
surface properties

### sortie can

USE **sortie systems**

### sortie lab

USE **sortie systems**

### sortie systems

UF *sortie can*  
*sortie lab*  
GS payloads  
. **sortie systems**  
RT space laboratories  
Space Shuttle payloads  
space shuttles  
space stations  
Spacelab payloads

### sorting

USE **classifying**

### sorting algorithms

(added November 1994)  
DEF An algorithm that finds the most significant element in a set which is then compared to each element in succession to achieve an efficient sorting process.

GS mathematical logic  
 . algorithms  
 . . **sorting algorithms**  
 RT ∞ classifying  
 computer techniques  
 heuristic methods  
 hypercube multiprocessors  
 iterative solution  
 parallel processing (computers)  
 Poisson density functions  
 selection  
 sequential analysis

**SOS (semiconductors)**

UF *silicon-on-sapphire junctions*  
*silicon-on-sapphire semiconductors*  
*silicon-on-sapphire transistors*  
 GS electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . metal oxide semiconductors  
 . . . . **SOS (semiconductors)**  
 . . . . transistors  
 . . . . silicon transistors  
 . . . . . **SOS (semiconductors)**  
 semiconductors (materials)  
 . metal oxide semiconductors  
 . . **SOS (semiconductors)**  
 RT ITO (semiconductors)  
 SIS (semiconductors)  
 SOI (semiconductors)

**SOT**

USE **solar optical telescope**

*sound*

USE **acoustics**

*sound absorption*

USE **sound transmission**

**sound amplification**

GS amplification  
 . **sound amplification**  
 RT acoustic attenuation  
 acoustic excitation  
 acoustics

*sound barrier*

USE **acoustic velocity**

**sound detecting and ranging**

(added February 1993)  
 UF *acoustic detection*  
 RT acoustic scattering  
 atmospheric temperature  
 ∞ instruments  
 measuring instruments  
 meteorological instruments  
 meteorology  
 temperature measurement

*sound detectors*

USE **sound transducers**

**sound fields**

DEF Regions containing sound waves.  
 RT acoustics  
 field theory (physics)  
 microsonics  
 propeller noise

**sound fixing and ranging**

DEF A method for acoustically tracking submerged bodies or floats utilizing fixed hydrophones. Used for SFAR and SOFAR.  
 UF *SFAR*  
*SOFAR*  
 RT sound ranging  
 sound transmission  
 underwater acoustics

*sound frequencies*

USE **acoustic frequencies**

**sound generators**

DEF Transducers which convert electrical, mechanical or other forms of energy into sound. Used for acoustic generators.  
 UF *acoustic generators*  
 RT acoustic nozzles

audio frequencies  
 auditory stimuli  
 bells  
 continuous noise  
 ∞ generators  
 horns  
 loudspeakers  
 noise generators  
 radiation sources  
 signal generators  
 ∞ signals  
 sirens  
 warning systems

*sound holography*

USE **acoustical holography**

**sound intensity**

DEF In a specified direction at a point, the average rate of sound energy transmitted in the specified direction through a unit area normal to this direction at the point considered.

GS acoustic properties  
 . **sound intensity**  
 . . zero sound rates (per time)  
 . flux density  
 . . **sound intensity**  
 . . . zero sound

RT

auditory stimuli  
 bioacoustics  
 effective perceived noise levels  
 loudness  
 noise intensity  
 noise measurement  
 radiant flux density  
 signal fading  
 signal fading rate  
 sirens

**sound localization**

GS perception  
 . **sound localization**  
 RT auditory perception  
 bearing (direction)  
 binaural hearing  
 detection  
 echo sounding  
 ∞ orientation  
 position indicators  
 range finders  
 sonar  
 space perception  
 tracking (position)

*sound measurement*

USE **acoustic measurement**

*sound perception*

USE **auditory perception**

**sound pressure**

DEF At a point, the total instantaneous pressure at that point in the presence of a sound wave minus the static pressure at that point.

GS pressure  
 . radiation pressure  
 . . **sound pressure**  
 RT acoustic measurement  
 acoustic velocity  
 explosions  
 flux density  
 loudness  
 noise (sound)  
 shock waves  
 static pressure

**sound propagation**

GS transmission  
 . wave propagation  
 . . acoustic propagation  
 . . . **sound propagation**  
 RT acoustics  
 attenuation  
 ∞ conduction  
 diffusion  
 noise generators  
 noise propagation

shock wave propagation

**sound ranging**

GS rangefinding  
 . **sound ranging**  
 RT detection  
 distance measuring equipment  
 echo sounding  
 position (location)  
 sonar  
 sound fixing and ranging  
 target acquisition  
 tracking (position)

**sound transducers**

UF *sound detectors*  
 GS transducers  
 . **sound transducers**  
 . . electroacoustic transducers  
 . . . hydrophones  
 . . . loudspeakers  
 . . . microphones  
 RT electroacoustics  
 ∞ radiators  
 signal detection  
 signal detectors  
 underwater acoustics  
 underwater communication

**sound transmission**

UF *sound absorption*  
 GS transmission  
 . **sound transmission**  
 RT ∞ absorption  
 acoustics  
 attenuation  
 audio frequencies  
 ∞ conduction  
 earphones  
 elastic waves  
 energy absorption  
 monaural signals  
 multipath transmission  
 ∞ paths  
 propeller noise  
 signal transmission  
 sirens  
 sound fixing and ranging  
 telephony  
 thermoclines  
 wave propagation

*sound velocity*

USE **acoustic velocity**

**sound waves**

SN (ELASTIC WAVES IN THE AUDIBLE RANGE)  
 DEF Mechanical disturbances advancing with infinite velocity through an elastic medium, and consisting of longitudinal displacements of the medium, i.e., consisting of compressional and rarefactional displacements parallel to the direction of advance of the disturbance; a longitudinal wave. Sound waves are small amplitude adiabatic oscillations. Used for acoustic radiation and acoustic vibrations.  
 UF *acoustic radiation*  
*acoustic vibrations*  
 GS elastic waves  
 . **sound waves**  
 . . electroacoustic waves  
 . . ion acoustic waves  
 . . Lamb waves  
 . . noise (sound)  
 . . . aircraft noise  
 . . . . blade slap noise  
 . . . . jet aircraft noise  
 . . . . propeller noise  
 . . . . sonic booms  
 . . engine noise  
 . . . rocket engine noise  
 . . flow noise  
 . . thermal noise  
 . . . aerodynamic noise  
 . . . . blade slap noise  
 . . . . propeller noise  
 . . . . screech tones  
 RT acoustic coupling  
 acoustic frequencies

## sounding

- acoustic measurement
- acoustic properties
- acoustic streaming
- acoustical holography
- acoustics
- aeolian tones
- audio frequencies
- auditory perception
- ∞ blasts
- computational aeroacoustics
- deep scattering layers
- detonation waves
- diffusion
- longitudinal waves
- loudness
- Mach cones
- magnetoelastic waves
- microsonics
- noise pollution
- noise prediction (aircraft)
- phonons
- plane waves
- polarized elastic waves
- ∞ radiation
- reverberation
- shock waves
- sodar
- sonograms
- surface acoustic wave devices
- thermoacoustic effects
- ultrasonic radiation
- ∞ waves

### sounders

USE **sounding**

### sounding

DEF Any penetration of the natural environment for scientific observation usually by sounding rockets or balloons. Used for sounders.

UF *sounders*

GS **sounding**

- . acoustic sounding
- . atmospheric sounding
- . balloon sounding
- . echo sounding
- . ionospheric sounding
- . microwave sounding
- . rocket sounding
- . satellite sounding

RT

- bathymeters

- depth measurement

∞ measurement

- meteorological balloons
- meteorological flight
- ROBIN balloons
- sondes

### sounding rockets

DEF Rockets designed primarily for routine upper air observation (as opposed to research) in the lower 250,000 feet of the atmosphere, especially that portion inaccessible to balloons, i.e., above 100,000. Used for meteorological rockets and rocket sondes.

UF *meteorological rockets*  
*rocket sondes*

GS **sounding rockets**

- . . Aerobee rocket vehicle
- . . Antares rocket vehicle
- . . Apache rocket vehicle
- . . Arcas rocket vehicles
- . . Aries sounding rocket
- . . Astrobee rocket vehicles
- . . . Astrobee 1500 rocket vehicle
- . . Black Brant sounding rockets
- . . . Black Brant 1 sounding rocket
- . . . Black Brant 2 sounding rocket
- . . . Black Brant 3 sounding rocket
- . . . Black Brant 4 sounding rocket
- . . . Black Brant 5 sounding rocket
- . . Cajun rocket vehicle
- . . Dornier paraglider rocket vehicle
- . . EXOS sounding rocket
- . . Jaguar rocket vehicle
- . . Judi-Dart rocket
- . . Kappa rocket vehicles
- . . . Kappa 8 rocket vehicle
- . . . Kappa 9 rocket vehicle

- . . Lambda rocket vehicles
- . . Loki rocket vehicle
- . . Petrel sounding rocket
- . . Phoenix sounding rocket
- . . Skua rocket vehicles
- . . Skylark rocket vehicle
- . . Venus fly trap rocket vehicle
- . . Veronique rocket vehicles
- . . Vertical rockets
- . . WASP sounding rocket

RT acoustic sounding

Argo rocket vehicles

ionosondes

Javelin rocket vehicle

meteorological instruments

meteorological satellites

Nike-Javelin rocket vehicle

payload control

radiosondes

rocket sounding

sondes

Viking rocket vehicle

### sounds (topographic features)

GS **sounds (topographic features)**

- . Block Island Sound (RI)
- . McMurdo sound
- . Prince William Sound (AK)

RT Chesapeake Bay (US)

inlets (topography)

oceans

rivers

water

### sound-sound interactions

RT harmonics

∞ interactions

intermodulation

wave dispersion

### source programs

GS computer programs

. **source programs**

RT open source licensing (computers)

### ∞ sources

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT causes

derivation

electron sources

extragalactic radio sources

ion sources

nonpoint sources

radiation sources

radio sources (astronomy)

sinks

### South Africa

USE **Republic of South Africa**

### South America

GS continents

. **South America**

RT Andes Mountains (South America)

Argentina

Bolivia

Brazil

Central America

Chile

Colombia

Ecuador

French Guiana

Guyana

Magdalena-Cauca Valley (Colombia)

Paraguay

Peru

Surinam

Trinidad and Tobago

Uruguay

Venezuela

### South Carolina

GS nations

. United States

. **South Carolina**

RT Sand Hills Region (GA-NC-SC)

### South Dakota

GS nations

. United States

. . **South Dakota**

RT Black Hills (SD-WY)

Missouri River (US)

### South Korea

UF *Republic of Korea*

GS nations

. **South Korea**

RT Asia

∞ Korea

North Korea

### South Vietnam

USE **Vietnam**

### South West Africa

USE **Namibia**

### Southeast Asia

GS regions

. **Southeast Asia**

RT Asia

Vietnam

### Southern California

GS regions

. **Southern California**

RT California

Mexico

Nevada

Pacific Ocean

United States

### Southern Hemisphere

GS **Southern Hemisphere**

. Antarctic regions

. . McMurdo sound

. . Ross ice shelf

RT ∞ hemispheres

Northern Hemisphere

Southern Oscillation

Southern sky

### Southern Oscillation

GS oscillations

. **Southern Oscillation**

RT anomalies

atmospheric circulation

atmospheric pressure

climate

el Nino

Madden-Julian Oscillation

periodic variations

pressure oscillations

quasi-biennial oscillation

Southern Hemisphere

### Southern sky

DEF That portion of the celestial sphere between the celestial equator and the celestial south pole (and generally visible from areas in the Earth's southern hemisphere).

RT astronomical catalogs

astronomical observatories

astronomical photography

astronomical spectroscopy

astronomy

northern sky

sky surveys (astronomy)

Southern Hemisphere

### Southern Yemen

UF *Aden*

GS nations

. **Southern Yemen**

regions

. **Southern Yemen**

RT Asia

### sovereignty

RT international cooperation

international law

politics

voting

### Soviet satellites

GS artificial satellites

. **Soviet satellites**

. . Cosmos 782 satellite

. . Cosmos 936 satellite

- . . Cosmos satellites
  - . . . Cosmos 2 satellite
  - . . . Cosmos 3 satellite
  - . . . Cosmos 5 satellite
  - . . . Cosmos 6 satellite
  - . . . Cosmos 14 satellite
  - . . . Cosmos 44 satellite
  - . . . Cosmos 54 satellite
  - . . . Cosmos 71 satellite
  - . . . Cosmos 110 satellite
  - . . . Cosmos 137 satellite
  - . . . Cosmos 144 satellite
  - . . . Cosmos 149 satellite
  - . . . Cosmos 166 satellite
  - . . . Cosmos 186 satellite
  - . . . Cosmos 188 satellite
  - . . . Cosmos 206 satellite
  - . . . Cosmos 213 satellite
  - . . . Cosmos 224 satellite
  - . . . Cosmos 225 satellite
  - . . . Cosmos 381 satellite
  - . . . Cosmos 954 satellite
  - . . . Cosmos 1129 satellite
  - . . Interkosmos satellites
  - . . Granat satellite
  - . . Molniya satellites
  - . . Prognoz satellites
  - . . Proton satellites
  - . . . Proton 1 satellite
  - . . . Proton 2 satellite
  - . . . Proton 3 satellite
  - . . . Proton 4 satellite
  - . . Raduga satellite
  - . . Sputnik satellites
  - . . . Sputnik 1 satellite
  - . . . Sputnik 2 satellite
  - . . . Sputnik 3 satellite
  - . . . Sputnik 4 satellite
  - . . . Sputnik 5 satellite
  - . . Venera satellites
  - . . . Venera 2 satellite
  - . . . Venera 3 satellite
  - . . . Venera 4 satellite
  - . . . Venera 5 satellite
  - . . . Venera 6 satellite
  - . . . Venera 7 satellite
  - . . . Venera 8 satellite
  - . . . Venera 9 satellite
  - . . . Venera 10 satellite
  - . . . Venera 11 satellite
  - . . . Venera 12 satellite
  - RT Russian Space Program
- Soviet spacecraft**
- GS **Soviet spacecraft**
    - . Buran space shuttle
    - . Lunik lunar probes
    - . . Lunik 2 lunar probe
    - . . Lunik 3 lunar probe
    - . . Lunik 9 lunar probe
    - . . Lunik 10 lunar probe
    - . . Lunik 11 lunar probe
    - . . Lunik 12 lunar probe
    - . . Lunik 13 lunar probe
    - . . Lunik 14 lunar probe
    - . . Lunik 16 lunar probe
    - . . Lunik 17 lunar probe
    - . . Lunik 19 lunar probe
    - . . Lunik 20 lunar probe
    - . . Lunik 22 lunar probe
    - . Mars 1 spacecraft
    - . Mars 2 spacecraft
    - . Mars 3 spacecraft
    - . Mars 4 Spacecraft
    - . Mars 5 spacecraft
    - . Mars 6 spacecraft
    - . Mars 7 spacecraft
    - . Mir space station
    - . Salyut space station
    - . Soyuz spacecraft
    - . Sputnik satellites
    - . . Sputnik 1 satellite
    - . . Sputnik 2 satellite
    - . . Sputnik 3 satellite
    - . . Sputnik 4 satellite
    - . . Sputnik 5 satellite
    - . Venera satellites
    - . . Venera 2 satellite
    - . . Venera 3 satellite
- . . Venera 4 satellite
  - . . Venera 5 satellite
  - . . Venera 6 satellite
  - . . Venera 7 satellite
  - . . Venera 8 satellite
  - . . Venera 9 satellite
  - . . Venera 10 satellite
  - . . Venera 11 satellite
  - . . Venera 12 satellite
  - . Zond space probes
  - . . Zond 1 space probe
  - . . Zond 2 space probe
  - . . Zond 3 space probe
  - . . Zond 4 space probe
  - . . Zond 5 space probe
  - . . Zond 6 space probe
  - . . Zond 7 space probe
  - . . Zond 8 space probe
  - . Phobos spacecraft
  - RT Russian Space Program
  - ∞ spacecraft
- Soviet Union**
- USE **U.S.S.R.**
- soybeans**
- GS farm crops
    - . leguminous plants
    - . . **soybeans**
    - . plants (botany)
      - . leguminous plants
      - . . **soybeans**
  - RT ∞ food
- Soyuz spacecraft**
- GS manned spacecraft
    - . **Soyuz spacecraft**
    - . Soviet spacecraft
    - . **Soyuz spacecraft**
  - RT Apollo Soyuz test project
    - . Assured Crew Return Vehicle
    - . Kvant modules
    - . Salyut space station
    - . U.S.S.R. space program
- ∞ **space**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT algebra
    - . analysis (mathematics)
    - . Cartan space
    - . cislunar space
    - . deep space
    - . fractals
    - . function space
    - . hyperspaces
    - . set theory
    - . spatial dependencies
- space adaptation syndrome**
- RT aerospace medicine
    - . bioastronautics
    - . biological effects
    - . long duration space flight
    - . manned space flight
    - . motion sickness
    - . physiological effects
    - . psychological effects
    - . space flight stress
    - . space psychology
    - . weightlessness
- Space Arrow satellite*
- USE **Cosmos 149 satellite**
- space based radar**
- DEF Radar systems installed on large space structures.
  - GS radar
    - . **space based radar**
    - . . Shuttle Imaging Radar
  - RT airborne radar
    - . antenna arrays
    - . radiation effects
    - . radiation shielding
- space bases**
- GS **space bases**
    - . lunar bases
    - . planetary bases
- . space colonies
  - . . Mars bases
  - RT ∞ bases
    - . Mir space station
    - . Salyut space station
    - . space stations
    - . stations
- space biology*
- USE **exobiology**
- space buses*
- USE **ferry spacecraft**
- space capsules**
- DEF Containers used for carrying out experiments in space. Used for capsules (spacecraft).
  - UF *capsules (spacecraft)*
  - GS **space capsules**
    - . Discoverer recovery capsules
    - . escape capsules
    - . Mercury spacecraft
    - . . Aurora 7
    - . . Faith 7
    - . . Friendship 7
    - . . SIGMA 7
  - RT artificial satellites
    - . biosatellites
    - . cabin atmospheres
  - ∞ capsules
    - . cockpits
    - . Gemini spacecraft
    - . interplanetary spacecraft
    - . landing modules
    - . lunar spacecraft
    - . manned spacecraft
    - . Mercury flights
    - . recoverable spacecraft
    - . reentry vehicles
    - . rendezvous spacecraft
    - . soft landing spacecraft
  - ∞ spacecraft
    - . spacecraft cabins
    - . spacecraft modules
    - . unmanned spacecraft
    - . voskhod manned spacecraft
    - . Vostok spacecraft
- space charge**
- DEF The electric charge carries by a cloud or stream of electrons or ions in a vacuum or a region of low gas pressure when the charge is sufficient to produce local changes in the potential distribution. The net electric charge within a given volume.
  - GS electric charge
    - . **space charge**
  - RT bunching
    - . Child-Langmuir law
    - . electric discharges
    - . electron clouds
    - . Landau damping
    - . magnetohydrodynamics
    - . nonohmic effect
    - . orbitrons
    - . perveance
    - . plasmas (physics)
    - . static electricity
- space colonies**
- GS communities
    - . **space colonies**
    - . space bases
    - . . **space colonies**
  - RT lunar bases
    - . lunar shelters
    - . Mars bases
    - . Mars exploration
    - . space habitats
    - . space stations
    - . terraforming
- space commercialization**
- DEF For profit activities in space or prefatory to space activity.
  - GS commercialization
    - . **space commercialization**
  - RT aerospace industry
    - . Ariane 4 launch vehicle

## space communication

- Ariane 5 launch vehicle
- commerce lab
- commercial spacecraft
- communication satellites
- data products
- direct broadcast satellites
- Energiya launch vehicle
- insurance (contracts)
- lunar mining
- ∞ microgravity applications
- Proton launch vehicle
- space industrialization
- space manufacturing
- space processing
- space tourism
- spacecraft launching
- technology transfer

### space communication

DEF The act of, or methods for, conveying information to, from, or through outer space.

GS telecommunication

#### . space communication

- . . extraterrestrial communication
- . . interplanetary communication
- . . lunar communication
- . . . circumlunar communication
- . . spacecraft communication
- . . . reentry communication
- . . . satellite communication

RT

- communication satellites
- Defense Communications Satellite System
- extraterrestrial intelligence
- free-space optical communication
- furlable antennas
- interstellar communication
- lasers
- line of sight communication
- manned space flight
- optical communication
- pulse communication
- radio communication
- radio telemetry
- television systems
- wireless communication

### space cooling (buildings)

DEF The cooling of buildings with a solar energy system which incorporates water chillers controlled by thermostats and other devices to provide a comfortable living environment.

GS cooling

#### . space cooling (buildings)

RT

- cooling systems
- energy technology
- heat exchangers
- heat pumps
- liquid cooling
- residential energy
- solar collectors
- solar cooling
- solar energy conversion
- temperature control

### space debris

GS debris

#### . space debris

RT

- asteroid belts
- asteroids
- Chiron
- cosmic dust
- dust
- meteoroids
- micrometeoroids
- near Earth objects
- ∞ spacecraft
- spacecraft breakup
- spacecraft design
- Toro asteroid
- Vesta asteroid

### space density

GS density (mass/volume)

#### . space density

density (number/volume)

#### . space density

RT

- atmospheric density
- electron density (concentration)
- ion density (concentration)

- particle density (concentration)
- plasma density
- plasma interaction experiment
- proton density (concentration)

### space detection and tracking system

UF *SPADATS (tracking system)*

GS

networks

- . tracking networks

#### . . space detection and tracking system

tracking (position)

#### . space detection and tracking system

RT

- minitrack system
- missile tracking
- optical tracking
- photographic tracking
- polystation doppler tracking system
- spacecraft tracking
- STDN (network)
- ∞ systems
- tracking stations

### space diversity

USE **reception diversity**

### space electric rocket tests

UF *SERT (rocket tests)*

GS

engine tests

#### . space electric rocket tests

RT

- electric rocket engines
- flight tests
- ground tests
- SERT 1 spacecraft
- SERT 2 spacecraft
- ∞ tests

### space elevators

(added March 2005)

DEF Elevators designed to provide access to space from ground or low altitude.

GS

elevators (lifts)

#### . space elevators

RT

space transportation

### space environment

USE **aerospace environments**

### space environment simulation

GS simulation

- . environment simulation

#### . . space environment simulation

- . . . weightlessness simulation
- . . . . neutral buoyancy simulation

RT

- altitude simulation
- atmospheric entry simulation
- clinorotation
- clinostats
- flight simulation
- flight simulators
- High Vacuum Orbital Simulator
- Langley complex coordinator
- motion simulators
- solar simulation
- thermal simulation
- vacuum chambers
- virtual reality

### space environmental lubrication

USE **spacecraft lubrication**

### space erectable structures

GS **space erectable structures**

- . inflatable spacecraft

- . . Beacon satellites

- . . . Beacon Explorer A

- . . . Explorer 22 satellite

RT

- expandable structures
- folding structures
- inflatable space structures
- inflatable structures
- Large Deployable Reflector
- large space structures
- maypole antennas
- orbital assembly
- rigid structures
- self erecting devices
- space station modules
- space station structures

- space technology experiments
- spacecraft modules
- spacecraft structures
- ∞ structures

### Space Exper with Particle Accelerators

USE **SEPAC (payload)**

### space exploration

UF *planetary exploration*

GS

exploration

#### . space exploration

- . . lunar exploration

- . . Mars exploration

RT

- aerospace environments

- asteroid missions

- astrodynamics

∞ astronautics

- bioastronautics

- Cassini mission

- Constellation program

- extraterrestrial environments

- extraterrestrial resources

- French space program

- International Space Year

- interplanetary flight

- interplanetary spacecraft

- interstellar spacecraft

- Jupiter rings

- Magellan project (NASA)

- manned Mars missions

- manned space flight

- Mars 69 project

- Mars 71 project

- Mars sample return missions

- MESSENGER (spacecraft)

- New Horizons mission

- planetary aerial vehicles

- planetary bases

- planetary composition

- planetary geology

- sample return missions

- Solar Maximum Mission-A

- TOPS (spacecraft)

- Viking 1 spacecraft

- Viking 2 spacecraft

- Viking lander 1

- Viking lander 2

- Viking lander spacecraft

- Viking Mars program

- Viking orbiter 1

- Viking orbiter 2

- Viking orbiter spacecraft

### space flight

GS

#### space flight

- . interplanetary flight

- . interstellar travel

- . long duration space flight

- . lunar flight

- . manned space flight

- . . Apollo flights

- . . . Apollo 5 flight

- . . . Apollo 6 flight

- . . . Apollo 7 flight

- . . . Apollo 8 flight

- . . . Apollo 9 flight

- . . . Apollo 10 flight

- . . . Apollo 11 flight

- . . . Apollo 12 flight

- . . . Apollo 13 flight

- . . . Apollo 14 flight

- . . . Apollo 15 flight

- . . . Apollo 16 flight

- . . . Apollo 17 flight

- . . Gemini flights

- . . . Gemini 3 flight

- . . . Gemini 4 flight

- . . . Gemini 5 flight

- . . . Gemini 6 flight

- . . . Gemini 7 flight

- . . . Gemini 8 flight

- . . . Gemini 9 flight

- . . . Gemini 10 flight

- . . . Gemini 11 flight

- . . . Gemini 12 flight

- . . manned reentry

- . . Mercury flights

- . . . Mercury MA-1 flight

- . . . Mercury MA-2 flight

- . . . Mercury MA-3 flight
- . . . Mercury MA-4 flight
- . . . Mercury MA-5 flight
- . . . Mercury MA-6 flight
- . . . Mercury MA-7 flight
- . . . Mercury MA-8 flight
- . . . Mercury MA-9 flight
- . . . Mercury MR-1 flight
- . . . Mercury MR-2 flight
- . . . Mercury MR-3 flight
- . . . Mercury MR-4 flight
- . . . Space Shuttle missions
- . . . Space Shuttle mission 31-A
- . . . Space Shuttle mission 31-B
- . . . Space Shuttle mission 31-C
- . . . Space Shuttle mission 31-D
- . . . Space Shuttle mission 41-A
- . . . Space Shuttle mission 41-B
- . . . Space Shuttle mission 41-C
- . . . Space Shuttle mission 41-D
- . . . Space Shuttle mission 41-G
- . . . Space Shuttle mission 51-A
- . . . Space Shuttle mission 51-B
- . . . Space Shuttle mission 51-C
- . . . Space Shuttle mission 51-D
- . . . Space Shuttle mission 51-E
- . . . Space Shuttle mission 51-F
- . . . Space Shuttle mission 51-G
- . . . Space Shuttle mission 51-H
- . . . Space Shuttle mission 51-I
- . . . Space Shuttle mission 51-J
- . . . Space Shuttle mission 51-L
- . . . Space Shuttle mission 61-A
- . . . Space Shuttle mission 61-B
- . . . Space Shuttle mission 61-C
- . . . Space Shuttle mission 61-E
- . return to Earth space flight
- RT aerospace environments
- Apollo Soyuz test project
- ascent propulsion systems
- astrodynamics
- ∞ astronautics
- atmospheric entry
- auxiliary propulsion
- bioastronautics
- celestial bodies
- expeditions
- exploration
- extravehicular activity
- ∞ flight
- flight mechanics
- flight optimization
- flight simulation
- flyby missions
- Grand Tours
- Mariner Jupiter-Saturn flyby
- Mariner Jupiter-Uranus flyby
- meteorological flight
- ∞ missions
- orbits
- Physics and Chemistry Experiment in Space
- pointing control systems
- propulsion
- reentry
- rocket flight
- ∞ rockets
- solar sails
- Space Transportation System flights
- spacecraft guidance
- spacecraft maneuvers
- spacecraft propulsion
- suborbital flight
- trajectories
- Viking 1 spacecraft
- Viking 2 spacecraft
- Viking lander 1
- Viking lander 2
- Viking lander spacecraft
- Viking orbiter 1
- Viking orbiter 2
- Viking orbiter spacecraft

**space flight feeding**

- RT consumables (spacecrew supplies)
- dehydrated food
- diets
- eating
- ∞ food

- food intake
- food production (in space)
- life support systems
- nutrition
- nutritional requirements
- waste disposal

**space flight stress**

- GS stress (biology)
  - . flight stress (biology)
  - . . **space flight stress**
- RT boredom
- ∞ flight stress
- gravitational physiology
- gravity perception
- lower body negative pressure
- manned space flight
- space adaptation syndrome
- space psychology
- stress (physiology)
- stress (psychology)
- weightlessness

**Space Flight Tracking and Data Network**

- GS networks
  - . tracking networks
  - . . **Space Flight Tracking and Data Network**
- RT ∞ data
  - data acquisition
  - Global Tracking Network
  - ground stations
  - satellite tracking
  - stations
  - STDN (network)
  - tracking stations

**space flight training**

- GS education
  - . flight training
  - . . **space flight training**
  - . . . astronaut training
- RT pilot training
- spacecraft cabin simulators
- training simulators

*space gliders*

- USE **lifting reentry vehicles**

**space glossaries**

- RT bibliographies
- dictionaries
- documentation
- indexes (documentation)
- information retrieval
- thesauri

**space habitats**

- RT aerospace environments
- closed ecological systems
- life support systems
- Mars bases
- space colonies
- space stations
- spacecrews
- terraforming

**space heating (buildings)**

- DEF Heating of living areas for the comfort of occupants (human and/ or animal) by any means (electricity, fuels, solar radiation, etc.).
- GS heating

. **space heating (buildings)**

- RT air conditioning
- environmental engineering
- heating equipment
- residential energy
- solar atriums
- solar heating
- solar houses
- temperature control
- waste energy utilization

**space industrialization**

- GS **space industrialization**
  - . space manufacturing
  - . space processing
  - . space tourism
- RT commercial spacecraft
- economic development

- energy conversion
- industries
- lunar mining
- manufacturing
- ∞ processes
- product development
- products
- research facilities
- space commercialization

**Space Infrared Telescope Facility**

- UF *SIRTF*
- Spitzer Space Telescope*
- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . **Space Infrared Telescope Facility**
- observatories
  - . astronomical observatories
  - . . astronomical satellites
  - . . . **Space Infrared Telescope Facility**
- telescopes
  - . infrared telescopes
  - . . **Space Infrared Telescope Facility**
  - . . . spaceborne telescopes
  - . . . **Space Infrared Telescope Facility**
- RT infrared astronomy
- spaceborne astronomy

**space laboratories**

- GS laboratories
  - . **space laboratories**
  - . . Advanced Technology Laboratory
  - . . Atmospheric Cloud Physics Lab (Spacelab)
  - . . Earth Viewing Applications Laboratory
  - . . Long Duration Exposure Facility
  - . . manned orbital laboratories
  - . . . Columbus module
  - . . . Destiny Laboratory Module
  - . . . Kibo Japanese Experiment Module
  - . . . Skylab 1
  - . . . Skylab 2
  - . . . Skylab 3
  - . . . Skylab 4
  - . . . Spacelab
- RT ∞ aerospace sciences
- artificial satellites
- geophysical satellites
- lunar laboratories
- Mir space station
- orbital workshops
- research facilities
- research vehicles
- SAIL project
- Salyut space station
- sortie systems
- Space Station Freedom
- space stations
- spaceborne experiments
- ∞ spacecraft

**space law**

- GS law (jurisprudence)
  - . international law
  - . . **space law**
- RT air law
- direct broadcast satellites
- insurance (contracts)
- outer space treaty
- planetary protection
- sabotage

**space logistics**

- GS logistics
  - . **space logistics**
- RT Automated Transfer Vehicle
- consumables (spacecraft)
- consumables (spacecrew supplies)
- extraterrestrial resources
- manned space flight
- spacecraft cabin simulators
- spacecrew transfer

## space maintenance

stowage (onboard equipment)

### space maintenance

GS maintenance  
  . **space maintenance**  
RT astronaut training  
∞ astronautics  
  extravehicular activity  
  orbital workers  
  payload transfer  
  remote manipulator system  
  Space Station Mobile Servicing System

### space manufacturing

GS fabrication  
  . **space manufacturing**  
  manufacturing  
  . **space manufacturing**  
  space industrialization  
  . **space manufacturing**  
RT aerospace environments  
  assembling  
  commercial spacecraft  
  construction  
  high vacuum  
  industries  
  levitation melting  
  liquid bridges  
  low gravity manufacturing  
∞ microgravity applications  
  space commercialization  
  space processing  
  spaceborne experiments  
  technologies  
  vacuum effects  
  weightlessness

### space mechanics

GS mechanics (physics)  
  . classical mechanics  
  . . . **space mechanics**  
  . . . . astrodynamics  
  . . . . celestial mechanics  
  . . . . orbital mechanics  
  . . . . . Kepler laws  
  . . . . . minimum variance orbit determination  
RT flight mechanics  
  magnetohydrodynamics  
  orbital space tests  
  quadratures

### space medicine

USE **aerospace medicine**

### space missions

GS **space missions**  
  . Cassini mission  
  . Cluster Mission  
  . flyby missions  
  . . Giotto mission  
  . . Grand Tours  
  . . . Mariner Jupiter-Saturn flyby  
  . . . Mariner Jupiter-Uranus flyby  
  . . . Voyager 1977 mission  
  . . Comet Nucleus Tour  
  . . Comet Rendezvous Asteroid Flyby Mission  
  . . Deep Impact Mission  
  . . Mariner Venus-Mercury 1973  
  . . Mariner-Mercury 1973  
  . . Near Earth Asteroid Rendezvous Mission  
  . . New Horizons mission  
  . . Stardust Mission  
  . . SOHO Mission  
  . . Solar Maximum Mission  
  . . Solar Maximum Mission-A  
  . . asteroid missions  
  . . Starprobe mission  
  . . Ulysses mission  
  . . Comet Rendezvous Asteroid Flyby Mission  
  . . Near Earth Asteroid Rendezvous Mission  
  . . Rosetta mission  
  . . Deep Space 1 Mission  
  . . Genesis mission  
  . . Mars missions

. . 2001 Mars Odyssey  
. . manned Mars missions  
. . Mars sample return missions  
. . Mars Surveyor 2001 Mission  
. . sample return missions  
. . Mars sample return missions  
. . Stardust Mission  
. . GRACE mission  
. . GRAIL mission  
. . Juno mission  
. . Kepler mission

RT Apollo Soyuz test project  
Chinese space program  
Earth-Venus trajectories  
European space programs  
French space program  
Indian space program  
Japanese space program  
Magellan project (NASA)  
MESSENGER (spacecraft)  
∞ missions  
  Skylab 1  
  Skylab 2  
  Skylab 3  
  Skylab 4  
  space programs  
  Space Shuttle missions  
∞ spacecraft  
  STEREO (observatory)  
  TOPS (spacecraft)

### space navigation

GS navigation  
  . **space navigation**  
  . . interplanetary navigation  
RT air navigation  
  astrodynamics  
∞ astronautics  
  astronavigation  
  autonomous navigation  
  celestial navigation  
  digital navigation  
  Earth-Venus trajectories  
  formation flying  
  Global Positioning System  
  inertial navigation  
  interplanetary flight  
  interplanetary trajectories  
  manned spacecraft  
  orbit determination  
  orbital maneuvers  
  orbital mechanics  
  orbits  
  radar navigation  
  radio navigation  
  reference stars  
  satellite guidance  
  satellite navigation systems  
  spacecraft guidance  
  spacecraft position indicators  
  standardized space guidance

### space observations (from Earth)

DEF Surveillance of extraterrestrial phenomena from the Earth's surface.

GS observation  
  . **space observations (from Earth)**  
RT asteroid detection  
  astronomical interferometry  
  detection  
  observation scheduling  
  radio observation  
  reconnaissance  
  seeing (astronomy)  
  space surveillance (ground based)

### Space Operations Center (NASA)

DEF A proposed NASA space station to be assembled in space that is designed for conducting space based operations such as satellite servicing, orbit transfer vehicle launch and recovery, and assembly of large space structures. Onboard capabilities could include space manufacturing and research experiments. When fully assembled it will be larger in size than the Space Shuttle.

GS artificial satellites  
  . space stations  
  . . **Space Operations Center (NASA)**  
  manned spacecraft

. **Space Operations Center (NASA)**  
stations  
. . space stations  
. . **Space Operations Center (NASA)**  
RT large space structures  
  orbital assembly  
  orbital servicing

### ∞ space orientation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT attitude (inclination)  
  bearing (direction)  
  vertical perception  
  visual perception

### space perception

DEF The ability to estimate depth or distance between points in the field of vision. Used for depth perception, distance perception, form perception, and slant perception.

UF *depth perception*  
*distance perception*  
*form perception*  
*slant perception*  
GS perception  
  . sensory perception  
  . . visual perception  
  . . . **space perception**  
  . . . . autokinesis

RT binocular vision  
  monocular vision  
  peripheral vision  
  range finders  
  sound localization  
  visual fields

### space photography

USE **spaceborne photography**

### space plasma H/V interaction experiments

USE **SPHINX**

### space plasmas

DEF Concentrations of free electrons and protons in the ionosphere, plasmasphere, and beyond.

GS particles  
  . charged particles  
  . . energetic particles  
  . . . plasmas (physics)  
  . . . . **space plasmas**  
  . . . . . solar wind  
  . . . . . stellar winds  
  . . corpuscular radiation  
  . . energetic particles  
  . . . plasmas (physics)  
  . . . . **space plasmas**  
  . . . . . solar wind  
  . . . . . stellar winds

RT AMPTE (satellites)  
  Cluster Mission  
  CRRES (satellite)  
  dusty plasmas  
  Earth magnetosphere  
  flux transfer events  
  galactic winds  
  geomagnetism  
  IMAGE satellite  
  ionopause  
  magnetic field reconnection  
  magnetohydrodynamic stability  
  magnetohydrodynamics  
  OPEN Project  
  plasma density  
  plasma diagnostics  
  plasma interactions  
  plasma layers  
  plasma physics  
  plasma waves  
  plasma-electromagnetic interaction  
  polar cusps  
  Polar/GGS spacecraft  
  space weather  
  SPHINX  
  wave-particle interactions  
  Wind/GGS spacecraft

### space platforms

DEF Gimbal-mounted platforms equipped

with gyros and accelerometers for maintaining a desired orientation in inertial space independent of spacecraft motion.

#### GS **space platforms**

- . Columbus space station
- . Eureka (ESA)
- . Long Duration Exposure Facility
- . man tended free flyers
- . space station polar platforms
- . synchronous platforms

#### RT Earth Observing System (EOS)

- intraorbit transfer vehicles
- orbital servicing

#### ∞ platforms

- shape control
- Space Station Freedom
- space stations

#### **space power reactors**

##### GS

- auxiliary power sources
- . nuclear auxiliary power units
- . **space power reactors**
- . . . fission electric cells
- . . . . SNAP 2
- . . . . SNAP 4
- . . . . SNAP 8
- . . . . SNAP 10A
- . . . . SNAP 50
- . . . space power unit reactors
- nuclear electric power generation
- . nuclear auxiliary power units
- . **space power reactors**
- . . . fission electric cells
- . . . . SNAP 2
- . . . . SNAP 4
- . . . . SNAP 8
- . . . . SNAP 10A
- . . . . SNAP 50
- . . . space power unit reactors
- . nuclear power reactors
- . **space power reactors**
- . . . fission electric cells
- . . . . SNAP 2
- . . . . SNAP 4
- . . . . SNAP 8
- . . . . SNAP 10A
- . . . . SNAP 50
- . . . space power unit reactors
- nuclear reactors
- . nuclear power reactors
- . **space power reactors**
- . . . fission electric cells
- . . . . SNAP 2
- . . . . SNAP 4
- . . . . SNAP 8
- . . . . SNAP 10A
- . . . . SNAP 50
- . . . space power unit reactors

##### RT

- heat exchangers
- space station power supplies
- turbogenerators

#### **space power unit reactors**

##### UF

- SPUR (reactors)*

##### GS

- auxiliary power sources
- . nuclear auxiliary power units
- . space power reactors
- . . **space power unit reactors**
- nuclear electric power generation
- . nuclear auxiliary power units
- . space power reactors
- . . **space power unit reactors**
- . nuclear power reactors
- . space power reactors
- . . **space power unit reactors**
- nuclear reactors
- . nuclear power reactors
- . space power reactors
- . . **space power unit reactors**

##### RT

- fission electric cells
- heat exchangers
- SNAP
- SNAP 2
- SNAP 4
- SNAP 8
- SNAP 50
- turbogenerators

#### **space probes**

##### GS

- unmanned spacecraft

#### **space probes**

- . . Explorer 18 satellite
- . . Giotto mission
- . . Jupiter probes
- . . . Galileo probe
- . . . Galileo spacecraft
- . . lunar probes
- . . . Lunik lunar probes
- . . . . Lunik 2 lunar probe
- . . . . Lunik 3 lunar probe
- . . . . Lunik 9 lunar probe
- . . . . Lunik 10 lunar probe
- . . . . Lunik 11 lunar probe
- . . . . Lunik 12 lunar probe
- . . . . Lunik 13 lunar probe
- . . . . Lunik 14 lunar probe
- . . . . Lunik 16 lunar probe
- . . . . Lunik 17 lunar probe
- . . . . Lunik 19 lunar probe
- . . . . Lunik 20 lunar probe
- . . . . Lunik 22 lunar probe
- . . Ranger lunar probes
- . . . Ranger 1 lunar probe
- . . . Ranger 2 lunar probe
- . . . Ranger 3 lunar probe
- . . . Ranger 4 lunar probe
- . . . Ranger 5 lunar probe
- . . . Ranger 6 lunar probe
- . . . Ranger 7 lunar probe
- . . . Ranger 8 lunar probe
- . . . Ranger 9 lunar probe
- . . . Ranger lunar landing vehicles
- . . Surveyor lunar probes
- . . . Surveyor 1 lunar probe
- . . . Surveyor 2 lunar probe
- . . . Surveyor 3 lunar probe
- . . . Surveyor 4 lunar probe
- . . . Surveyor 5 lunar probe
- . . . Surveyor 6 lunar probe
- . . . Surveyor 7 lunar probe
- . . LCROSS (satellite)
- . . Lunar Reconnaissance Orbiter
- . . Mariner space probes
- . . . Mariner 1 space probe
- . . . Mariner 2 space probe
- . . . Mariner 3 space probe
- . . . Mariner 4 space probe
- . . . Mariner 5 space probe
- . . . Mariner 6 space probe
- . . . Mariner 7 space probe
- . . . Mariner 8 space probe
- . . . Mariner 9 space probe
- . . . Mariner 10 space probe
- . . . Mariner 11 space probe
- . . . Mariner R 2 space probe
- . . Mariner spacecraft
- . . Mariner C spacecraft
- . . Mariner Venus 67 spacecraft
- . . Mars probes
- . . . Advanced Recon Electric Spacecraft
- . . . Mariner 3 space probe
- . . . Mariner 4 space probe
- . . . Mariner 6 space probe
- . . . Mariner 7 space probe
- . . . Mariner 8 space probe
- . . . Mariner 9 space probe
- . . . Mars 1 spacecraft
- . . . Mars 2 spacecraft
- . . . Mars 3 spacecraft
- . . . Mars 4 Spacecraft
- . . . Mars 5 spacecraft
- . . . Mars 6 spacecraft
- . . . Mars 7 spacecraft
- . . . Mars Observer
- . . . Mars Pathfinder
- . . . Viking 1975 entry vehicle
- . . . Viking spacecraft
- . . . . Viking 1 spacecraft
- . . . . . Viking lander 1
- . . . . . Viking orbiter 1
- . . . . . Viking 2 spacecraft
- . . . . . Viking lander 2
- . . . . . Viking orbiter 2
- . . . . . Viking lander spacecraft
- . . . . . Viking lander 1
- . . . . . Viking lander 2
- . . . . . Viking orbiter spacecraft
- . . . . . Viking orbiter 1

- . . . . . Viking orbiter 2
- . . . . . Viking orbiter 1975
- . . . Mars Climate Orbiter
- . . . Mars Express
- . . . Mars Global Surveyor
- . . . Mars Polar Lander
- . . . Mars Reconnaissance Orbiter
- . . . Nozomi Mars Orbiter
- . . . Phobos spacecraft
- . . . Phoenix Mars Lander
- . . . Zond 2 space probe
- . . Pioneer space probes
- . . . Pioneer 1 space probe
- . . . Pioneer 2 space probe
- . . . Pioneer 3 space probe
- . . . Pioneer 4 space probe
- . . . Pioneer 5 space probe
- . . . Pioneer 6 space probe
- . . . Pioneer 7 space probe
- . . . Pioneer 8 space probe
- . . . Pioneer 9 space probe
- . . . Pioneer 10 space probe
- . . . Pioneer 11 space probe
- . . . Pioneer Venus 2 entry probes
- . . . Pioneer Venus 2 night probe
- . . . Pioneer Venus 2 sounder probe
- . . solar probes
- . . . Helios 1
- . . . Helios 2
- . . . Helios A
- . . . Helios B
- . . Starprobe spacecraft
- . . Sunblazer space probe
- . . Venus probes
- . . . Magellan spacecraft (NASA)
- . . . Mariner 1 space probe
- . . . Mariner 2 space probe
- . . . Mariner 5 space probe
- . . . Mariner 10 space probe
- . . . Pioneer Venus 2 spacecraft
- . . . Pioneer Venus 2 entry probes
- . . . Pioneer Venus 2 night probe
- . . . Pioneer Venus 2 sounder probe
- . . . Pioneer Venus 2 transporter bus
- . . Venera satellites
- . . . Venera 2 satellite
- . . . Venera 3 satellite
- . . . Venera 4 satellite
- . . . Venera 5 satellite
- . . . Venera 6 satellite
- . . . Venera 7 satellite
- . . . Venera 8 satellite
- . . . Venera 9 satellite
- . . . Venera 10 satellite
- . . . Venera 11 satellite
- . . . Venera 12 satellite
- . . Zond 1 space probe
- . . Zond 3 space probe
- . . Zond 4 space probe
- . . Zond 5 space probe
- . . Zond 6 space probe
- . . Zond 7 space probe
- . . Zond 8 space probe
- . . Huygens probe
- . . MESSENGER (spacecraft)
- . . Microwave Anisotropy Probe
- . . Voyager 1 spacecraft
- . . Voyager 2 spacecraft

##### RT

- Atlas Able 5 launch vehicle
- Cassini mission
- Deep Impact Mission
- interplanetary spacecraft
- magnetic probes
- maneuverable spacecraft
- Mariner program
- meteorological satellites
- Pioneer project
- Pioneer Venus 1 spacecraft
- Pioneer Venus spacecraft
- ∞ probes
- radio occultation
- satellite television
- Voyager 1977 mission
- Voyager project

#### **space processing**

- DEF Synthesis, processing, forming, and fabrication of compounds or materials in space



## Space Processing Applications Rocket

or in a simulated space environment; normally involving techniques that exploit low-gravity or high-vacuum conditions.

GS space industrialization

### . space processing

RT acoustic levitation  
bioprocessing  
commercial spacecraft  
containerless melts  
crystal growth  
diamond films  
electric furnaces  
float zones  
levitation melting  
liquid bridges  
low gravity manufacturing  
Marangoni convection  
metalorganic chemical vapor deposition  
microgravity  
∞ microgravity applications  
miscibility gap  
orbital workshops  
protein crystal growth  
single crystals  
space commercialization  
space manufacturing  
spaceborne experiments  
thermocapillary migration  
ultrapure metals

## Space Processing Applications Rocket

DEF Sounding rocket used for space processing experiments by NASA. Used for SPAR (rocket).

UF *SPAR (rocket)*

RT launch vehicles  
metal foams  
payloads  
rocket vehicles  
weightlessness

## space programs

GS programs  
. space programs  
.. Argentine space program  
.. Australian space program  
.. Brazilian space program  
.. Canadian space program  
.. Alouette project  
.. Chinese space program  
.. European space programs  
.. Austrian space program  
.. Belgian space program  
.. Czechoslovakian space program  
.. Danish space program  
.. Finnish space program  
.. French space program  
.. German space program  
.. Greek space program  
.. Hungarian space program  
.. Icelandic space program  
.. Italian space program  
.. Luxembourg space program  
.. Netherlands space program  
.. Norwegian space program  
.. Portuguese space program  
.. Spanish space program  
.. Swedish space program  
.. Swiss space program  
.. Turkish space program  
.. UK space program  
.. geographic applications program  
.. Indian space program  
.. Indonesian space program  
.. Israeli space program  
.. Japanese space program  
.. Mexican space program  
.. NASA space programs  
.. Apollo applications program  
.. Apollo project  
.. Bioastronautical Orbital Space System  
.. Centaur project  
.. Earth & Ocean Physics Applications Program  
.. Earth Resources Program  
.. Earth Resources Survey Program

.. SEASAT program  
.. Echo project  
.. Galileo project  
.. Gemini project  
.. Helios Project  
.. Jupiter project  
.. Magellan project (NASA)  
.. Mariner program  
.. Mariner Venus-Mercury 1973  
.. Mariner-Mercury 1973  
.. Mars 69 project  
.. Mars 71 project  
.. Mercury project  
.. National Launch Vehicle Program  
.. NEW MOONS project  
.. Nimbus project  
.. OPEN Project  
.. Pioneer project  
.. Project SETI  
.. Ranger project  
.. Agena B Ranger Program  
.. Constellation program  
.. Mars Surveyor 98 Program  
.. New Horizons mission  
.. Rover project  
.. SAIL project  
.. Saturn project  
.. Scout project  
.. Skylab program  
.. Starprobe mission  
.. Surveyor project  
.. Synchronous Communications Satellite Proj  
.. Tektite project  
.. TIROS project  
.. Titan project  
.. Vanguard project  
.. Viking Mars program  
.. Voyager project  
.. New Zealand space program  
.. Pakistan space program  
.. Russian Space Program  
.. Saudi Arabian space program  
.. U.S.S.R. space program  
.. Ukrainian space program  
RT Apollo Soyuz test project  
European Space Agency  
International Space Year  
ISRO  
manned space flight  
NASA programs  
∞ research projects  
Solar Maximum Mission  
space missions

## space psychology

GS medical science  
. aerospace medicine  
. space psychology  
psychology  
RT . space psychology  
astronaut performance  
astronaut training  
aviation psychology  
manned space flight  
military psychology  
psychological effects  
psychological factors  
social factors  
space adaptation syndrome  
space flight stress  
stress (psychology)

## space radiation

USE extraterrestrial radiation

## space radiators

USE spacecraft radiators

## space rations

GS consumables (spacecrew supplies)  
. space rations  
rations  
RT ∞ food  
∞ food  
food production (in space)  
provisioning

stowage (onboard equipment)

## space rendezvous

UF *spacecraft rendezvous*  
GS rendezvous  
. space rendezvous  
.. orbital rendezvous  
.. Earth orbital rendezvous  
.. lunar orbital rendezvous  
RT Apollo Soyuz test project  
autonomous docking  
rendezvous trajectories  
spacecraft docking  
transfer orbits

## space sciences

USE aerospace sciences

## space self maneuvering units

USE self maneuvering units

## Space Shuttle Ascent Stage

DEF Shuttle take-off configuration comprising the orbiter, solid rocket boosters, and external tank.

GS spacecraft configurations

### . Space Shuttle Ascent Stage

RT Advanced Solid Rocket Motor (STS)  
ascent propulsion systems  
external tanks  
Space Shuttle Boosters  
Space Shuttle orbiters  
Space Shuttle upper stages  
space shuttles  
stage separation

## Space Shuttle Boosters

UF *Shuttle Boosters*  
*Solid Rocket Boosters (Space Shuttle)*  
*Space Shuttle Solid Rocket Motors SRB (Solid Rocket Boosters)*  
GS engines  
. rocket engines  
.. booster rocket engines  
.. Space Shuttle Boosters  
.. Advanced Solid Rocket Motor (STS)  
.. solid propellant rocket engines  
.. Space Shuttle Boosters  
.. Advanced Solid Rocket Motor (STS)  
RT ∞ boosters  
manned spacecraft  
O ring seals  
reusable spacecraft  
Space Shuttle Ascent Stage

## Space Shuttle Main Engine

DEF Liquid propellant propulsion system using fuel drawn from external tanks to provide power for the orbiter to attain orbital speed.

GS engines  
. rocket engines  
.. liquid propellant rocket engines  
.. Space Shuttle Main Engine

RT propulsion  
space transportation system  
Space Transportation System flights

## Space Shuttle mission 31-A

GS space flight  
. manned space flight  
.. Space Shuttle missions  
.. Space Shuttle mission 31-A  
RT Columbia (Orbiter)

## Space Shuttle mission 31-B

GS space flight  
. manned space flight  
.. Space Shuttle missions  
.. Space Shuttle mission 31-B  
RT Challenger (Orbiter)

## Space Shuttle mission 31-C

UF *Space Shuttle Orbital Flight 7*  
GS space flight  
. manned space flight  
.. Space Shuttle missions  
.. Space Shuttle mission 31-C

RT Challenger (Orbiter)	. . . Space Shuttle missions	RT Get Away Specials (STS)
<b>Space Shuttle mission 31-D</b>	. . . <b>Space Shuttle mission 51-G</b>	∞ missions
UF <i>Space Shuttle Orbital Flight 8</i>	RT Discovery (Orbiter)	space missions
GS space flight	Saudi Arabian space program	space transportation system
. manned space flight	<b>Space Shuttle mission 51-H</b>	<i>Space Shuttle Orbital Flight 7</i>
. . . Space Shuttle missions	GS space flight	USE <b>Space Shuttle mission 31-C</b>
. . . <b>Space Shuttle mission 31-D</b>	. manned space flight	<i>Space Shuttle Orbital Flight 8</i>
RT Challenger (Orbiter)	. . . Space Shuttle missions	USE <b>Space Shuttle mission 31-D</b>
<b>Space Shuttle mission 41-A</b>	. . . <b>Space Shuttle mission 51-H</b>	<i>Space Shuttle Orbital Flight 9</i>
UF <i>Space Shuttle Orbital Flight 9</i>	RT Atlantis (orbiter)	USE <b>Space Shuttle mission 41-A</b>
GS space flight	<b>Space Shuttle mission 51-I</b>	<i>Space Shuttle Orbital Flight Test 1</i>
. manned space flight	GS space flight	USE <b>Space Transportation System 1 flight</b>
. . . Space Shuttle missions	. manned space flight	<i>Space Shuttle Orbital Flight Test 2</i>
. . . <b>Space Shuttle mission 41-A</b>	. . . Space Shuttle missions	USE <b>Space Transportation System 2 flight</b>
RT Columbia (Orbiter)	. . . <b>Space Shuttle mission 51-I</b>	<i>Space Shuttle Orbital Flight Test 3</i>
<b>Space Shuttle mission 41-B</b>	RT Discovery (Orbiter)	USE <b>Space Transportation System 3 flight</b>
GS space flight	<b>Space Shuttle mission 51-J</b>	<i>Space Shuttle Orbital Flight Test 4</i>
. manned space flight	GS space flight	USE <b>Space Transportation System 4 flight</b>
. . . Space Shuttle missions	. manned space flight	<i>Space Shuttle Orbital Flight Tests</i>
. . . <b>Space Shuttle mission 41-B</b>	. . . Space Shuttle missions	USE <b>Space Transportation System flights</b>
RT Challenger (Orbiter)	. . . <b>Space Shuttle mission 51-J</b>	<i>Space Shuttle Orbital Flights</i>
<b>Space Shuttle mission 41-C</b>	RT Atlantis (orbiter)	USE <b>Space Transportation System flights</b>
GS space flight	<b>Space Shuttle mission 51-L</b>	<i>Space Shuttle Orbiter 099</i>
. manned space flight	GS space flight	USE <b>Challenger (Orbiter)</b>
. . . Space Shuttle missions	. manned space flight	<i>Space Shuttle Orbiter 101</i>
. . . <b>Space Shuttle mission 41-C</b>	. . . Space Shuttle missions	USE <b>Enterprise (Orbiter)</b>
RT Challenger (Orbiter)	. . . <b>Space Shuttle mission 51-L</b>	<i>Space Shuttle Orbiter 102</i>
<b>Space Shuttle mission 41-D</b>	RT Challenger (Orbiter)	USE <b>Columbia (Orbiter)</b>
GS space flight	<b>Space Shuttle mission 61-A</b>	<i>Space Shuttle Orbiter 103</i>
. manned space flight	GS space flight	USE <b>Discovery (Orbiter)</b>
. . . Space Shuttle missions	. manned space flight	<i>Space Shuttle Orbiter 104</i>
. . . <b>Space Shuttle mission 41-D</b>	. . . Space Shuttle missions	USE <b>Atlantis (orbiter)</b>
RT Discovery (Orbiter)	. . . <b>Space Shuttle mission 61-A</b>	<i>Space Shuttle Orbiter 105</i>
<b>Space Shuttle mission 41-G</b>	RT Challenger (Orbiter)	USE <b>Endeavour (orbiter)</b>
GS space flight	Columbia (Orbiter)	<b>Space Shuttle orbiters</b>
. manned space flight	<b>Space Shuttle mission 61-B</b>	UF <i>Shuttle Orbiters</i>
. . . Space Shuttle missions	GS space flight	GS manned spacecraft
. . . <b>Space Shuttle mission 41-G</b>	. manned space flight	. space shuttles
RT Challenger (Orbiter)	. . . Space Shuttle missions	. . . <b>Space Shuttle orbiters</b>
<b>Space Shuttle mission 51-A</b>	. . . <b>Space Shuttle mission 61-B</b>	. . . Atlantis (orbiter)
GS space flight	RT Atlantis (orbiter)	. . . Challenger (Orbiter)
. manned space flight	<b>Space Shuttle mission 61-C</b>	. . . Columbia (Orbiter)
. . . Space Shuttle missions	GS space flight	. . . Discovery (Orbiter)
. . . <b>Space Shuttle mission 51-A</b>	. manned space flight	. . . Endeavour (orbiter)
RT Discovery (Orbiter)	. . . Space Shuttle missions	. . . Enterprise (Orbiter)
<b>Space Shuttle mission 51-B</b>	. . . <b>Space Shuttle mission 61-C</b>	reentry vehicles
GS space flight	RT Columbia (Orbiter)	. recoverable spacecraft
. manned space flight	<b>Space Shuttle mission 61-E</b>	. reusable spacecraft
. . . Space Shuttle missions	GS space flight	. . . space shuttles
. . . <b>Space Shuttle mission 51-B</b>	. manned space flight	. . . <b>Space Shuttle orbiters</b>
RT Challenger (Orbiter)	. . . Space Shuttle missions	. . . . . Atlantis (orbiter)
<b>Space Shuttle mission 51-C</b>	. . . <b>Space Shuttle mission 61-E</b>	. . . . . Challenger (Orbiter)
GS space flight	RT Columbia (Orbiter)	. . . . . Columbia (Orbiter)
. manned space flight	<b>Space Shuttle missions</b>	. . . . . Discovery (Orbiter)
. . . Space Shuttle missions	GS space flight	. . . . . Endeavour (orbiter)
. . . <b>Space Shuttle mission 51-C</b>	. manned space flight	. . . . . Enterprise (Orbiter)
RT Discovery (Orbiter)	. . . <b>Space Shuttle missions</b>	reentry vehicles
<b>Space Shuttle mission 51-D</b>	. . . Space Shuttle mission 31-A	. recoverable spacecraft
GS space flight	. . . Space Shuttle mission 31-B	. reusable spacecraft
. manned space flight	. . . Space Shuttle mission 31-C	. . . space shuttles
. . . Space Shuttle missions	. . . Space Shuttle mission 31-D	. . . <b>Space Shuttle orbiters</b>
. . . <b>Space Shuttle mission 51-D</b>	. . . Space Shuttle mission 41-A	. . . . . Atlantis (orbiter)
RT Discovery (Orbiter)	. . . Space Shuttle mission 41-B	. . . . . Challenger (Orbiter)
<b>Space Shuttle mission 51-E</b>	. . . Space Shuttle mission 41-C	. . . . . Columbia (Orbiter)
GS space flight	. . . Space Shuttle mission 41-D	. . . . . Discovery (Orbiter)
. manned space flight	. . . Space Shuttle mission 41-G	. . . . . Endeavour (orbiter)
. . . Space Shuttle missions	. . . Space Shuttle mission 51-A	. . . . . Enterprise (Orbiter)
. . . <b>Space Shuttle mission 51-E</b>	. . . Space Shuttle mission 51-B	RT Inertial Upper Stage
RT Challenger (Orbiter)	. . . Space Shuttle mission 51-C	manned space flight
<b>Space Shuttle mission 51-F</b>	. . . Space Shuttle mission 51-D	microwave scanning beam landing system
GS space flight	. . . Space Shuttle mission 51-E	payload integration plan
. manned space flight	. . . Space Shuttle mission 51-F	Shuttle Derived Vehicles
. . . Space Shuttle missions	. . . Space Shuttle mission 51-G	Space Shuttle Ascent Stage
. . . <b>Space Shuttle mission 51-F</b>	. . . Space Shuttle mission 51-H	space transportation system
RT Challenger (Orbiter)	. . . Space Shuttle mission 51-I	spacecraft recovery
<b>Space Shuttle mission 51-G</b>	. . . Space Shuttle mission 51-J	terminal area energy management
GS space flight	. . . Space Shuttle mission 51-L	<b>Space Shuttle payloads</b>
. manned space flight	. . . Space Shuttle mission 61-A	GS payloads
	. . . Space Shuttle mission 61-B	
	. . . Space Shuttle mission 61-C	
	. . . Space Shuttle mission 61-E	

## Space Shuttle upper stage A

- . **Space Shuttle payloads**
- .. Advanced Technology Laboratory
- .. Astro missions (STS)
- .. Atmospheric General Circulation Experiment
- .. Earth radiation budget experiment
- .. Earth Viewing Applications Laboratory
- .. electromagnetic environment experiment
- .. Get Away Specials (STS)
- .. Halogen Occultation Experiment
- .. OSS-1 payload
- .. OSTA-1 payload
- .. OSTA-3 payload
- .. Physics and Chemistry Experiment in Space
- .. plasma interaction experiment
- .. Spacelab
- .. X Ray Astrophysics Facility
- RT commerce lab
- extravehicular activity
- Feature Identification and Location Exper
- Hubble Space Telescope
- Multi-Purpose Logistics Modules
- orbital servicing
- payload assist module
- payload integration
- payload integration plan
- Shuttle Imaging Radar
- sortie systems
- space station payloads
- space technology experiments
- space transportation system
- spaceborne experiments
- Starlab

Space Shuttle Solid Rocket Motors

USE **Space Shuttle Boosters**

### Space Shuttle upper stage A

DEF A version of a spinning solid upper stage centered around an Atlas Centaur launch vehicle. Used for SSUS-A.

UF *SSUS-A*

GS Space Shuttle upper stages

. **Space Shuttle upper stage A**

RT Atlas Centaur launch vehicle

### Space Shuttle upper stage D

DEF A version of a spinning solid upper stage centered around a Delta launch vehicle. Used for SSUS-D.

UF *SSUS-D*

GS Space Shuttle upper stages

. **Space Shuttle upper stage D**

RT Delta launch vehicle  
solid propellant rocket engines  
spin stabilization

### Space Shuttle upper stages

DEF A collective term for the various types of upper stages planned for the Space Shuttle.

GS **Space Shuttle upper stages**

. Space Shuttle upper stage A

. Space Shuttle upper stage D

. spinning solid upper stage

RT Space Shuttle Ascent Stage

### space shuttles

GS manned spacecraft

. **space shuttles**

.. Buran space shuttle

.. Hermes manned spaceplane

.. Space Shuttle orbiters

... Atlantis (orbiter)

... Challenger (Orbiter)

... Columbia (Orbiter)

... Discovery (Orbiter)

... Endeavour (orbiter)

... Enterprise (Orbiter)

reentry vehicles

. recoverable spacecraft

.. reusable spacecraft

... **space shuttles**

... Buran space shuttle

... Hermes manned spaceplane

... Space Shuttle orbiters

... Atlantis (orbiter)

- ... Challenger (Orbiter)
- ... Columbia (Orbiter)
- ... Discovery (Orbiter)
- ... Endeavour (orbiter)
- ... Enterprise (Orbiter)
- RT Advanced Launch System (STS)
- AEPS
- Aeromaneuvering Orbit to Orbit Shuttle
- annular suspension and pointing system
- approach and landing tests (STS)
- Assess program
- auxiliary propulsion
- BESS (satellite)
- Columbus space station
- entry guidance (STS)
- Eureca (ESA)
- extendable stages (spacecraft)
- German Infrared Laboratory
- HOTOL launch vehicle
- Inertial Upper Stage
- interim stages (spacecraft)
- International Space Station
- intraorbit transfer vehicles
- LIRTS (telescope)
- manned space flight
- Orbit Maneuvering Engine (Space Shuttle)
- orbit transfer vehicles
- orbital maneuvers
- payload control
- payload deployment & retrieval system
- payload retrieval (STS)
- SAIL project
- Shuttle Derived Vehicles
- Shuttle Engineering Simulator
- Shuttle pallet satellites
- single stage to orbit vehicles
- sortie systems
- Space Shuttle Ascent Stage
- space transportation system
- Space Transportation System flights
- ∞ spacecraft
- spacecraft recovery
- Spacelab

### space simulators

DEF Devices used to simulate one or more parameters of the space environment used for testing space systems or components. Specifically, a closed chamber capable of approximating the vacuum and normal environments of space. Used for orbital simulators.

UF *orbital simulators*

GS simulators

. environment simulators

.. **space simulators**

... clinostats

... High Vacuum Orbital Simulator

... Langley complex coordinator

RT centrifuges

flight simulators

neutral buoyancy simulation

solar simulators

spacecraft environments

vacuum chambers

### Space Station Freedom

(added August 1991)

UF *Freedom Space Station*

GS artificial satellites

. space stations

.. **Space Station Freedom**

stations

. space stations

.. **Space Station Freedom**

RT Columbus space station

International Space Station

large space structures

NASA space programs

orbital servicing

space laboratories

space platforms

space station payloads

space station polar platforms

space station power supplies

space station propulsion

space station structures

### Space Station Mobile Servicing System

(added September 2001)

DEF Canadian robotic arm system for the International Space Station (ISS), used for ISS assembly, maintenance and payload servicing. Includes three primary components: the Space Station Remote Manipulator System, Mobile Base System, and Special Purpose Dexterous Manipulator.

UF *Canadarm (ISS)*

*Mobile Servicing System (ISS)*

*MSS (International Space Station)*

*Space Station Remote Manipulator System*

GS manipulators

. remote manipulator system

.. **Space Station Mobile Servicing System**

robot arms

. **Space Station Mobile Servicing System**

RT Canadian space program

International Space Station

orbital assembly

payload deployment & retrieval

system

remote handling

robots

space maintenance

space station modules

### space station modules

(added November 1998)

GS modules

. **space station modules**

.. Columbus module

.. Cupola Module

.. Destiny Laboratory Module

.. Kibo Japanese Experiment Module

.. Kvant modules

.. Multi-Purpose Logistics Modules

.. Priroda module

.. Service Module (ISS)

.. Unity connecting module

.. Zarya control module

RT

airlock modules

compartments

International Space Station

Mir space station

orbital assembly

space erectable structures

Space Station Mobile Servicing

System

space station structures

spacecraft docking modules

spacecraft modules

### space station payloads

GS payloads

. **space station payloads**

RT Alpha Magnetic Spectrometer

Earth Observing System (EOS)

man tended free flyers

Space Shuttle payloads

Space Station Freedom

space station polar platforms

space stations

Spacelab payloads

### space station polar platforms

UF *polar platforms (space stations)*

GS artificial satellites

. space stations

.. **space station polar platforms**

space platforms

. **space station polar platforms**

stations

. space stations

.. **space station polar platforms**

RT Columbus space station

Earth Observing System (EOS)

polar orbits

remote sensing

Space Station Freedom

space station payloads

### space station power supplies

GS electric power supplies

- . **space station power supplies**
- RT electric batteries
- energy storage
- solar arrays
- solar cells
- solar dynamic power systems
- space power reactors
- Space Station Freedom
- space stations
- spacecraft power supplies
- thermoelectric generators
- space station propulsion**
- GS propulsion
- . **space station propulsion**
- RT auxiliary propulsion
- electric propulsion
- hydrogen oxygen engines
- ion engines
- low thrust propulsion
- propulsion system configurations
- resistojet engines
- solar electric propulsion
- Space Station Freedom
- space stations
- spacecraft propulsion
- Space Station Remote Manipulator System*  
(added September 2001)
- USE **Space Station Mobile Servicing System**
- space station structures**
- GS **space station structures**
- . Integrated Truss Structure P1
- . Integrated Truss Structure S1
- . Integrated Truss Structure Z1
- RT Kvant modules
- large space structures
- orbital assembly
- Priroda module
- smart structures
- space erectable structures
- Space Station Freedom
- space station modules
- space stations
- spacecraft structures
- structural design
- ∞ structures
- space stations**
- UF *Earth orbiting space stations*
- manned orbital space stations*
- MOSS (space stations)*
- self deploying space stations*
- GS artificial satellites
- . **space stations**
- .. Automatic Universal Orbiting Stations
- .. Columbus space station
- .. Halo Orbit space station
- .. International Space Station
- .. man tended free flyers
- .. Mir space station
- .. orbiting lunar stations
- .. Salyut space station
- .. Skylab 1
- .. Skylab 2
- .. Skylab 3
- .. Skylab 4
- .. Space Operations Center (NASA)
- .. Space Station Freedom
- .. space station polar platforms stations
- . **space stations**
- .. Automatic Universal Orbiting Stations
- .. Columbus space station
- .. Halo Orbit space station
- .. International Space Station
- .. man tended free flyers
- .. Mir space station
- .. orbiting lunar stations
- .. Salyut space station
- .. Skylab 1
- .. Skylab 2
- .. Skylab 3
- .. Skylab 4
- .. Space Operations Center (NASA)
- .. Space Station Freedom
- .. space station polar platforms
- RT AEPS
- autonomous docking
- bioastronautics
- ferry spacecraft
- inflatable structures
- large space structures
- manned orbital laboratories
- manned spacecraft
- military spacecraft
- orbital servicing
- orbital space tests
- orbital workshops
- ∞ platforms
- rendezvous spacecraft
- Saturn 1 workshop
- Saturn 5 workshop
- Saturn workshops
- sortie systems
- space bases
- space colonies
- space habitats
- space laboratories
- space platforms
- space station payloads
- space station power supplies
- space station propulsion
- space station structures
- spacecraft docking
- spin stabilization
- X-38 crew return vehicle
- space storage**
- RT cryogenic fluid storage
- cryogenic rocket propellants
- cryogenic tanks
- propellant storage
- storable propellants
- ∞ storage
- storage tanks
- space suits**
- DEF Pressure suits for wear in space or at very low ambient pressures within the atmosphere, designed to permit the wearer to leave the protection of a pressurized cabin.
- GS clothing
- . protective clothing
- . . pressure suits
- . . . **space suits**
- . . . . extravehicular mobility units
- . suits
- . . pressure suits
- . . . **space suits**
- . . . . extravehicular mobility units
- RT safety devices
- ∞ **space surveillance**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT space surveillance (ground based)
- space surveillance (spaceborne)
- space surveillance (ground based)**
- GS surveillance
- . **space surveillance (ground based)**
- RT air defense
- antimissile defense
- asteroid detection
- minitrack system
- space observations (from Earth)
- ∞ space surveillance
- spacecraft tracking
- space surveillance (spaceborne)**
- GS surveillance
- . **space surveillance (spaceborne)**
- RT air defense
- antimissile defense
- high altitude nuclear detection
- ice mapping
- ice reporting
- military spacecraft
- optical countermeasures
- reconnaissance
- satellite-borne photography
- satellite-to-satellite tracking
- ∞ space surveillance
- spacecraft tracking
- space systems engineering*
- USE **aerospace engineering**
- space technology experiments**
- RT antenna design
- antennas
- large space structures
- space erectable structures
- Space Shuttle payloads
- spaceborne experiments
- space temperature**
- GS temperature
- . **space temperature**
- RT cryogenic temperature
- electron energy
- ion temperature
- space tools**
- GS tools
- . **space tools**
- RT low gravity manufacturing
- orbital workers
- telerobotics
- space tourism**
- (added April 1999)
- GS space industrialization
- . **space tourism**
- tourism
- . **space tourism**
- RT space commercialization
- space transportation
- space transportation**
- DEF The conveyance of payloads or personnel to, through, or from outer space.
- GS transportation
- . **space transportation**
- . . space transportation system
- . . . Advanced Launch System (STS)
- . . . Saenger space transportation system
- RT Delta Clipper
- HOPE aerospace plane
- HOTOL launch vehicle
- Inertial Upper Stage
- Japanese space program
- orbit transfer vehicles
- payload stations
- payloads
- single stage to orbit vehicles
- space elevators
- space tourism
- terminal area energy management
- space transportation system**
- DEF A joint NASA-DOD advanced space transportation concept for the 1980s. The main element of the STS is the Space Shuttle. Another element is the orbit transfer vehicles-OTV. A third element called Spacelab is designed and manufactured by the European Space Agency, has no propulsive capability and is carried by the Space Shuttle. Used for STS.
- UF STS
- GS transportation
- . space transportation
- . . **space transportation system**
- . . . Advanced Launch System (STS)
- . . . Saenger space transportation system
- RT Advanced Solid Rocket Motor (STS)
- annular suspension and pointing system
- approach and landing tests (STS)
- Atmospheric General Circulation Experiment
- defense program
- extravehicular mobility units
- Hermes manned spaceplane
- Inertial Upper Stage
- manned maneuvering units
- NASA programs
- orbital servicing
- OSS-1 payload
- OSTA-1 payload
- OSTA-2 payload

## Space Transportation System 1 flight

OSTA-3 payload  
 payload assist module  
 payload delivery (STS)  
 payload integration plan  
 payload retrieval (STS)  
 power modules (STS)  
 remote manipulator system  
 Space Shuttle Main Engine  
 Space Shuttle missions  
 Space Shuttle orbiters  
 Space Shuttle payloads  
 space shuttles  
 Space Transportation System flights  
 space tugs  
 Spacelab  
 ∞ systems

### Space Transportation System 1 flight

UF *OFT 1*  
*Orbital Flight Test 1 (shuttle)*  
*Space Shuttle Orbital Flight Test 1 STS-1*  
 GS Space Transportation System flights  
 . **Space Transportation System 1 flight**

### Space Transportation System 2 flight

UF *OFT 2*  
*Orbital Flight Test 2 (shuttle)*  
*Space Shuttle Orbital Flight Test 2 STS-2*  
 GS Space Transportation System flights  
 . **Space Transportation System 2 flight**

### Space Transportation System 3 flight

UF *OFT 3*  
*Orbital Flight Test 3 (shuttle)*  
*Space Shuttle Orbital Flight Test 3 STS-3*  
 GS Space Transportation System flights  
 . **Space Transportation System 3 flight**

### Space Transportation System 4 flight

UF *OFT 4*  
*Orbital Flight Test 4 (shuttle)*  
*Space Shuttle Orbital Flight Test 4 STS-4*  
 GS Space Transportation System flights  
 . **Space Transportation System 4 flight**

### Space Transportation System flights

DEF Revised collective designation for all Space Shuttle flights. Used for OFT, orbital flight tests (shuttle), Space Shuttle orbital flight tests, and Space Shuttle orbital flights.

UF *OFT*  
*orbital flight tests (shuttle)*  
*Space Shuttle Orbital Flight Tests*  
*Space Shuttle Orbital Flights*  
 GS **Space Transportation System flights**  
 . Space Transportation System 1 flight  
 . Space Transportation System 2 flight  
 . Space Transportation System 3 flight  
 . Space Transportation System 4 flight  
 RT entry guidance (STS)  
 geophysical fluid flow cells  
 Solar Cell Calibration Facility  
 space flight  
 Space Shuttle Main Engine  
 space shuttles  
 space transportation system  
 ∞ systems  
 ∞ tests

### space tugs

RT Inertial Upper Stage  
 modules  
 orbit transfer vehicles  
 orbital servicing  
 payloads  
 propulsion  
 space transportation system

spacecraft propulsion

### space vehicle checkout program

UF *spacecraft prelaunch tests*  
 RT checkout  
 countdown  
 performance tests  
 prefiring tests  
 spacecraft maintenance  
 ∞ tests

### space vehicle control

USE **spacecraft control**

### space vehicles

USE **spacecraft**

### space weapons

GS weapons  
 . **space weapons**  
 RT air to air missiles  
 antimissile missiles  
 Chaparral missile  
 laser weapons  
 Minuteman ICBM  
 nuclear weapons  
 surface to air missiles  
 weapon systems  
 weapons delivery

### space weather

(added June 1999)  
 SN (FOR METEOROLOGICAL CONDITIONS RELATED TO THE MIDDLE AND LOWER ATMOSPHERES OF NON-EARTH PLANETS USE "PLANETARY METEOROLOGY")  
 DEF The dynamic, highly variable conditions of the geospace environment that encompasses the sun, the interplanetary medium, and the Earth magnetosphere-ionosphere-thermosphere system. Major contributing factors include variations in the solar wind, solar flares, and solar mass ejections. Effects of space weather phenomena include performance degradation of communication, navigation, and power systems on both spacecraft and ground-based systems; and potential health hazards during extravehicular activity.  
 RT Advanced Composition Explorer  
 aerospace environments  
 aerospace safety  
 Earth ionosphere  
 Earth magnetosphere  
 Earth orbital environments  
 geomagnetism  
 GOES 13  
 interplanetary shock waves  
 ionospheric disturbances  
 magnetic disturbances  
 magnetic storms  
 Polar/GGS spacecraft  
 radiation hazards  
 solar activity effects  
 solar terrestrial interactions  
 space plasmas  
 weather

### space weathering

(added July 2001)  
 DEF All processes that act on material exposed to the space environment including micrometeorite impacts and interactions with solar wind, cosmic rays, and ambient plasma. Includes processes associated with exposure at the surface of airless planets or small bodies.  
 GS exposure  
 . weathering  
 . . **space weathering**  
 RT aerospace environments  
 damage  
 erosion  
 extraterrestrial environments  
 Long Duration Exposure Facility  
 lunar soil  
 micrometeorites

### spaceborne astronomy

GS astronomy  
 . **spaceborne astronomy**  
 RT Alpha Magnetic Spectrometer

Astro missions (STS)  
 astronomical interferometry  
 astronomical satellites  
 Constellation-X  
 Cosmic Background Explorer satellite  
 faint object camera  
 Fermi Gamma-ray Space Telescope  
 Gamma Ray Observatory  
 Granat satellite  
 Hipparcos satellite  
 Hubble Space Telescope  
 Infrared Space Observatory (ISO)  
 IUE  
 James Webb Space Telescope  
 LISA (observatory)  
 Magellan ultraviolet astronomy satellite  
 Microwave Anisotropy Probe  
 Pinhole Occulter Facility  
 Quasar  
 ROSAT mission  
 SAS-2  
 SAS-3  
 SOFIA (airborne observatory)  
 Space Infrared Telescope Facility  
 Starsat telescope  
 Submillimeter Wave Astronomy Satellite  
 Swift observatory  
 telescopes  
 ultraviolet telescopes  
 X Ray Astrophysics Facility

### spaceborne experiments

DEF A collective term designating the various experiments performed or planned in orbiting spacecraft and usually involving physical phenomena in space environments.

GS **spaceborne experiments**  
 . Orbiting Frog Otolith  
 . Physics and Chemistry Experiment in Space  
 . plasma interaction experiment  
 RT aerospace environments  
 AMPTE (satellites)  
 bioprocessing  
 Columbus module  
 CRRES (satellite)  
 Destiny Laboratory Module  
 experimentation  
 geophysical fluid flow cells  
 Get Away Specials (STS)  
 gloveboxes  
 International Space Station  
 Kibo Japanese Experiment Module  
 Long Duration Exposure Facility  
 man tended free flyers  
 molecular shields  
 Multi-Purpose Logistics Modules  
 OSS-1 payload  
 OSTA-1 payload  
 OSTA-3 payload  
 payload assist module  
 payload integration plan  
 payloads  
 space laboratories  
 space manufacturing  
 space processing  
 Space Shuttle payloads  
 space technology experiments  
 Spacelab  
 weightlessness

### spaceborne lasers

GS stimulated emission devices  
 . lasers  
 . . **spaceborne lasers**  
 RT airborne lasers  
 laser applications  
 remote sensors

### spaceborne photography

UF *space photography*  
 GS imagery  
 . photography  
 . . **spaceborne photography**  
 . . . satellite-borne photography  
 RT aerial photography  
 astronomical photography  
 black and white photography

cloud photographs  
cloud photography  
diffraction limited cameras  
Earth resources  
lunar photographs  
lunar photography  
Mars photographs  
multispectral band scanners  
photomapping  
photomaps  
rocket-borne photography  
satellite observation

**spaceborne telescopes**

GS telescopes  
. **spaceborne telescopes**  
. . Constellation-X  
. . Fermi Gamma-ray Space Telescope  
. . German Infrared Laboratory  
. . Hubble Space Telescope  
. . Infrared Space Observatory (ISO)  
. . James Webb Space Telescope  
. . Large Deployable Reflector  
. . LIRTS (telescope)  
. . solar optical telescope  
. . Space Infrared Telescope Facility  
. . Starlab  
. . Starsat telescope  
. . Wide-field Infrared Survey Explorer  
. . X Ray Astrophysics Facility  
. . XMM-Newton telescope  
RT Astro missions (STS)  
astronomical observatories  
astronomical photography  
astronomy  
diffraction limited cameras  
faint object camera  
Gamma Ray Observatory  
multi-anode microchannel arrays  
Next Generation Space Telescope project  
optical transfer function  
ROSAT mission  
Swift observatory

**∞ spacecraft**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
DEF Devices, manned and unmanned, which are designed to be placed into an orbit about the Earth or into a trajectory to another celestial body. Used for space vehicles.  
UF *space vehicles*  
RT Advanced Reconnaissance Electric Spacecraft  
aerospace vehicles  
air data systems  
Astro vehicle  
astrodynamics  
Atlantis (orbiter)  
auxiliary propulsion  
biosatellites  
Canadian spacecraft  
cargo spacecraft  
Challenger (Orbiter)  
Chinese spacecraft  
Clementine spacecraft  
Columbia (Orbiter)  
Czechoslovakian spacecraft  
Discovery (Orbiter)  
dual spin spacecraft  
Endeavour (orbiter)  
Enterprise (Orbiter)  
ESA spacecraft  
escape rockets  
expandable structures  
flexible spacecraft  
flight test vehicles  
French space program  
Galileo probe  
Galileo spacecraft  
ground support equipment  
hypersonic vehicles  
Indian space program  
Indian spacecraft  
inflatable spacecraft  
interplanetary spacecraft  
Israeli spacecraft  
Japanese space program

Japanese spacecraft  
launch vehicles  
lunar spacecraft  
Magellan spacecraft (NASA)  
maneuverable spacecraft  
manned orbital laboratories  
manned spacecraft  
Mariner Mark 2 Spacecraft  
Mark 1 spacecraft  
military spacecraft  
orbit transfer vehicles  
orbital maneuvering vehicles  
orbiting lunar stations  
outer planets explorers  
photo reconnaissance spacecraft  
Pioneer Venus 2 spacecraft  
power limited spacecraft  
Radiation Meteoroid spacecraft  
recoverable spacecraft  
reentry vehicles  
research vehicles  
∞ satellites  
∞ SERT 1 spacecraft  
SERT 2 spacecraft  
Shuttle Derived Vehicles  
soft landing spacecraft  
Solar Maximum Mission-A  
solettas  
Soviet spacecraft  
space capsules  
space debris  
space laboratories  
space missions  
space shuttles  
spacecraft cabin simulators  
spacecraft modules  
technology feasibility spacecraft  
test vehicles  
TOPS (spacecraft)  
transatmospheric vehicles  
unidentified flying objects  
unmanned spacecraft  
∞ vehicles  
Viking orbiter 1  
Viking orbiter 2  
Viking orbiter spacecraft  
Voyager 1 spacecraft  
Voyager 2 spacecraft  
X-30 vehicle  
X-37 vehicle

**spacecraft antennas**

GS antennas  
. **spacecraft antennas**  
radio equipment  
. **spacecraft antennas**  
telecommunication  
. **spacecraft antennas**  
RT furlable antennas

**spacecraft breakup**

(added August 1989)  
UF *breakup (spacecraft)*  
*orbital breakup*  
*reentry breakup*  
*satellite breakup*  
RT *satellite fragmentation*  
atmospheric entry  
destruction  
hazards  
meteoroid hazards  
orbit decay  
reentry effects  
space debris  
spacecraft reentry  
spacecraft survivability  
uncontrolled reentry (spacecraft)  
wreckage

**spacecraft cabin atmospheres**

GS controlled atmospheres  
. cabin atmospheres  
. . **spacecraft cabin atmospheres**  
RT carbon dioxide concentration  
closed ecological systems  
cockpits  
environmental control  
high pressure oxygen  
pressurized cabins

rebreathing

**spacecraft cabin simulators**

GS simulators  
. training simulators  
. . **spacecraft cabin simulators**  
training devices  
. training simulators  
. . **spacecraft cabin simulators**  
RT aerospace environments  
cockpit simulators  
manned spacecraft  
simulation  
space flight training  
space logistics  
∞ spacecraft  
test facilities

**spacecraft cabins**

GS compartments  
. **spacecraft cabins**  
spacecraft components  
. **spacecraft cabins**  
RT ∞ cabins  
cockpits  
crew experiment stations  
crew observation stations  
crew workstations  
pressurized cabins  
space capsules

**spacecraft charging**

DEF Electric charge induction upon the surface of a spacecraft by magnetospheric plasmas or other ion sources.  
RT electric fields  
external surface currents  
single event upsets  
spacecraft glow  
system generated electromagnetic pulses

*Spacecraft Charging at High Altitude*

USE **SCATHA satellite**

**spacecraft communication**

SN (COMMUNICATION OF SPACECRAFT WITH GROUND OR OTHER SPACECRAFT)  
DEF The act of, or methods for, conveying information to or from manned or unmanned spacecraft.  
GS telecommunication  
. space communication  
. . **spacecraft communication**  
. . . reentry communication  
. . . satellite communication  
RT ARPA computer network  
astrionics  
circumlunar communication  
Earth terminals  
facsimile communication  
ground-air-ground communication  
hoop column antennas  
interplanetary communication  
lunar communication  
optical communication  
packet transmission  
plasma antennas  
radio communication  
satellite communications ships  
satellite ground support  
single channel per carrier transmission  
system generated electromagnetic pulses  
unified S band  
wireless communication

**spacecraft components**

GS **spacecraft components**  
. service modules  
. . Multi-Purpose Logistics Modules  
. spacecraft cabins  
. spacecraft docking modules  
. spacecraft modules  
. . command modules  
. . command service modules  
. . landing modules  
. . . Lunar landing modules  
. . . Lunar Module

## spacecraft configurations

- . . . . Apollo lunar experiment module
- . . . . LSSM
- . . . . Lunar Module 5
- . . . . Lunar Module 7
- . . . . Altair Lunar Lander
- . . . Mars Excursion Module
- . . SIM
- RT airborne/spaceborne computers
- boron-epoxy composites
- commonality
- ∞ components
- nose cones
- rocket engines

### spacecraft computers

- USE **airborne/spaceborne computers**

### spacecraft configurations

- GS **spacecraft configurations**
  - . satellite configurations
  - . Space Shuttle Ascent Stage
- RT aerodynamic configurations
- aircraft configurations
- Apollo short stack
- ∞ configurations
- flared bodies
- launch vehicle configurations
- propulsion system configurations
- Radiation Meteoroid spacecraft
- reentry vehicles
- upper stage rocket engines

### spacecraft construction materials

- RT ∞ construction materials
- functionally gradient materials
- Ludox (trademark)
- ∞ materials
- materials selection

### spacecraft contamination

- GS contamination
  - . **spacecraft contamination**
- RT decontamination
- exobiology
- lab-on-a-chip devices

### spacecraft control

- UF *space vehicle control*
- GS **spacecraft control**
  - . satellite control
  - . . satellite attitude control
- RT attitude control
- automatic control
- ∞ control
- control simulation
- crew procedures (preflight)
- engine control
- flexible spacecraft
- flight control
- fly by wire control
- formation flying
- ground based control
- manual control
- Marquardt R4D engine
- missile control
- orbit determination
- pointing control systems
- radio control
- remote control
- rocket engine control
- shape control
- stationkeeping
- thrust vector control
- visual control

### spacecraft defense

- DEF The protection of spacecraft from undesirable external forces. Used for satellite defense.
- UF *satellite defense*
- RT spacecraft survivability
- stealth technology
- vulnerability

### spacecraft design

- DEF The act of conceiving and planning the structure, systems, and performance characteristics of any type of spacecraft including space

probes, satellites, space platforms and space stations.

#### GS **spacecraft design**

- . IPAD
- . satellite design
- RT Advanced Launch System (STS)
- aeroshells
- computer aided design
- ∞ design
- engine design
- Hermes manned spaceplane
- Indian space program
- Japanese space program
- lofting
- product development
- satellite temperature
- Shuttle Derived Vehicles
- space debris
- spacecraft temperature
- structural design
- systems engineering
- transatmospheric vehicles
- weight reduction

### spacecraft docking

DEF The act of coupling two or more orbiting objects; the operation of mechanically connecting together, or in some manner bring together orbital payloads.

- GS maneuvers
  - . docking
  - . . **spacecraft docking**
  - . spacecraft maneuvers
  - . . **spacecraft docking**

- RT ∞ astronautics
- autonomous docking
- interception
- Mir space station
- mooring
- multiple docking adapters
- orbital rendezvous
- rendezvous trajectories
- Salyut space station
- space rendezvous
- space stations
- spacecraft docking modules
- transfer orbits
- Unity connecting module

### spacecraft docking modules

- GS modules
  - . **spacecraft docking modules**
  - spacecraft components
  - . **spacecraft docking modules**
- RT airlock modules
- command modules
- command service modules
- landing modules
- Multi-Purpose Logistics Modules
- service modules
- space station modules
- spacecraft docking

### spacecraft electronic equipment

- GS electronic equipment
  - . **spacecraft electronic equipment**
  - onboard equipment
  - . spacecraft equipment
  - . . **spacecraft electronic equipment**
- RT airborne/spaceborne computers
- astrionics
- single event upsets

### spacecraft environments

- (added August 1989)
- SN (LIMITED TO SPACECRAFT INTERNAL COMPARTMENTS AND CABINS; FOR SPACECRAFT EXTERNAL ENVIRONMENTS REFER TO 'EXTRATERRESTRIAL ENVIRONMENTS')
- GS environments
  - . **spacecraft environments**
- RT aerospace medicine
- Automatic Universal Orbiting Stations
- bioastronautics
- closed ecological systems
- controlled atmospheres
- environmental control
- exobiology
- extraterrestrial environments
- intravehicular activity

life support systems

rotating environments

satellite temperature

space simulators

thermal environments

weightlessness

### spacecraft equipment

- GS onboard equipment
  - . **spacecraft equipment**
  - . . spacecraft electronic equipment
- RT ∞ equipment
- OSTA-3 payload
- spacecraft instruments

### spacecraft glow

- UF *shuttle glow*
- GS decay
  - . **spacecraft glow**
  - emission
  - . light emission
  - . . luminescence
  - . . . **spacecraft glow**
- RT Earth orbital environments
- spacecraft charging
- surface reactions

### spacecraft guidance

- GS guidance (motion)
  - . **spacecraft guidance**
  - . . satellite guidance
- RT automatic control
- autonomous docking
- autonomous navigation
- CCD star tracker
- celestial navigation
- command guidance
- formation flying
- ground based control
- inertial guidance
- injection guidance
- interplanetary flight
- interplanetary trajectories
- laser gyroscopes
- manual control
- midcourse guidance
- orbits
- reentry guidance
- rendezvous guidance
- space flight
- space navigation
- star trackers
- terminal guidance

### spacecraft instruments

DEF Electronic, optical, gyroscopic, and other instruments that play a role in the control of the spacecraft, or that function to measure, record, display, or process different values or quantities encountered in the flight of a spacecraft.

- UF *spacecraft sensors*
- GS **spacecraft instruments**
  - . satellite instruments
  - . . multispectral linear arrays
  - . spacecraft position indicators
- RT astronics
- Atmospheric Cloud Physics Lab (Spacelab)
- autonomous spacecraft clocks
- bubble technique
- flight instruments
- flight test instruments
- guidance sensors
- I2S cameras
- instrument packages
- ∞ instruments
- laser altimeters
- measuring instruments
- onboard equipment
- spacecraft equipment

### spacecraft landing

- GS landing
  - . **spacecraft landing**
  - . . horizontal spacecraft landing
  - . . lunar landing
  - . . planetary landing
  - . . . Mars landing
- RT aircraft landing

- approach and landing tests (STS)
  - crash landing
  - emergency landing
  - glide landings
  - hard landing
  - landing simulation
  - soft landing
  - soft landing spacecraft
  - terminal area energy management
  - touchdown
  - vertical landing
  - water landing
- spacecraft launching**
- UF *satellite launching*
  - GS launching
    - . **spacecraft launching**
    - . . . liftoff (launching)
  - RT countdown
    - Delta 4 Heavy launch vehicle
    - heavy lift launch vehicles
    - HOTOL launch vehicle
    - launch costs
    - launch dates
    - launch vehicles
    - launch windows
    - launching pads
    - missiles
    - orbit insertion
    - orbital launching
    - orbital shots
    - postlaunch reports
    - prelaunch summaries
    - railgun accelerators
    - reusable launch vehicles
    - rocket launching
    - space commercialization
- spacecraft lubrication**
- UF *space environmental lubrication*
  - GS lubrication
    - . **spacecraft lubrication**
  - RT self lubricating materials
- spacecraft maintenance**
- GS maintenance
    - . **spacecraft maintenance**
  - RT checkout
    - prelaunch tests
    - space vehicle checkout program
    - spacecraft reliability
    - turnaround (STS)
- spacecraft maneuvers**
- UF *satellite maneuvers*
  - GS maneuvers
    - . **spacecraft maneuvers**
    - . . . spacecraft docking
  - RT control simulation
    - formation flying
    - maneuverability
    - maneuverable spacecraft
    - orbit insertion
    - space flight
- spacecraft models**
- GS models
    - . **spacecraft models**
  - RT aircraft models
    - dynamic models
    - mathematical models
    - scale models
- spacecraft modules**
- GS modules
    - . **spacecraft modules**
    - . . . command modules
    - . . . command service modules
    - . . . landing modules
    - . . . . lunar landing modules
    - . . . . Lunar Module
    - . . . . . Apollo lunar experiment module
    - . . . . . LSSM
    - . . . . . Lunar Module 5
    - . . . . . Lunar Module 7
    - . . . . . Altair Lunar Lander
    - . . . . Mars Excursion Module
    - . . . SIM
  - RT spacecraft components
- spacecraft motion**
- SN (NONTRAJECTORY MOTION)
  - RT aerodynamic balance
    - aerodynamic stability
    - attitude stability
    - buffeting
    - control stability
    - dynamic stability
    - flexible spacecraft
    - flutter
  - ∞ motion
    - motion stability
    - oscillations
    - sideslip
    - stability
    - tumbling motion
    - vibration
- spacecraft orbital assembly*
- USE **orbital assembly**
- spacecraft orbits**
- GS orbits
    - . **spacecraft orbits**
    - . . . satellite orbits
    - . . . geosynchronous orbits
    - . . . parking orbits
    - . . . stationary orbits
    - . . . twenty-four hour orbits
    - . . transfer orbits
    - . . . interplanetary transfer orbits
  - RT circular orbits
    - Earth orbits
    - elliptical orbits
    - equatorial orbits
    - lunar orbits
    - orbit insertion
    - orbital mechanics
    - orbital position estimation
    - planetary orbits
    - retrograde orbits
    - solar orbits
- spacecraft performance**
- DEF The manner or effectiveness in which any space vehicle, space platform, or space station functions while in operation in space, or in a simulated space environment.
  - RT astronaut performance
  - ∞ performance
    - postlaunch reports
- spacecraft position indicators**
- GS display devices
    - . position indicators
    - . . **spacecraft position indicators**
    - . . . measuring instruments
    - . . . indicating instruments
    - . . . position indicators
    - . . . . **spacecraft position indicators**
    - . . . . spacecraft instruments
    - . . . . **spacecraft position indicators**
  - RT flight instruments
    - head-up displays
    - orbit determination
- spacecraft power supplies**
- DEF Sources of electrical energy, including batteries, generators, and energy conversion devices, that support the normal operation of spacecraft.
  - GS electric power supplies
    - . **spacecraft power supplies**
  - RT auxiliary power sources
    - cryocycle principle
    - direct power generators
    - electric batteries
    - ∞ energy sources
      - free-piston engines
      - laser power beaming
      - microwave power beaming
      - nickel hydrogen batteries
      - nuclear auxiliary power units
      - power beaming
      - power modules (STS)
    - ∞ power supplies
      - propellants
      - solar dynamic power systems
      - space station power supplies
      - thermophotovoltaic conversion
- spacecraft prelaunch tests*
- USE **space vehicle checkout program**
- spacecraft propulsion**
- DEF The action or process of imparting motion to a spacecraft by means of a force such as a thrust of air or energy released by burning fuel.
  - GS propulsion
    - . **spacecraft propulsion**
    - . . . electromagnetic propulsion
    - . . . magnetic sails
    - . . . electrostatic propulsion
    - . . . ion propulsion
    - . . . matter-antimatter propulsion
    - . . . negative matter propulsion
    - . . . photonic propulsion
    - . . . laser propulsion
    - . . . plasma propulsion
    - . . . solar propulsion
    - . . . solar electric propulsion
    - . . . solar thermal propulsion
  - RT chemical propulsion
    - descent propulsion systems
    - electric propulsion
    - fusion propulsion
    - Hall thrusters
    - laser propulsion
    - low thrust propulsion
    - magnetic nozzles
    - magnetoplasmadynamic thrusters
    - magnetoplasmadynamics
    - mass drivers
    - nuclear electric propulsion
    - nuclear propulsion
    - oxygen-hydrocarbon rocket engines
    - post boost propulsion system
    - propellants
    - pulsed inductive thrusters
    - pulsed plasma thrusters
    - rocket engines
    - rocket-based combined-cycle engines
    - Rover project
    - solar sails
    - space flight
    - space station propulsion
    - space tugs
    - total impulse
    - VASIMR (propulsion system)
- spacecraft radiators**
- UF *space radiators*
  - GS heat radiators
    - . **spacecraft radiators**
  - RT condensers (liquefiers)
    - cooling
    - cooling systems
    - radiative heat transfer
    - solar reflectors
- spacecraft recovery**
- UF *satellite capture*



## spacecraft reentry

- snatching*
  - RT booster recovery
  - Discoverer recovery capsules
  - recoverable spacecraft
  - ∞ recovery
  - recovery parachutes
  - recovery zones
  - rescue operations
  - reusable launch vehicles
  - Space Shuttle orbiters
  - space shuttles
  - water landing
- spacecraft reentry**
- GS atmospheric entry
  - . reentry
  - . . . **spacecraft reentry**
  - . . . uncontrolled reentry (spacecraft)
  - RT Earth-Venus trajectories
  - entry guidance (STS)
  - flight mechanics
  - hypersonic reentry
  - lifting reentry vehicles
  - manned reentry
  - return to Earth space flight
  - satellite lifetime
  - spacecraft breakup

- spacecraft reliability**
- GS reliability
  - . **spacecraft reliability**
  - RT circuit reliability
  - component reliability
  - controllability
  - prelaunch problems
  - quality control
  - spacecraft maintenance

- spacecraft rendezvous*
- USE **space rendezvous**

- spacecraft sensors*
- USE **spacecraft instruments**

- spacecraft shielding**
- GS shielding
  - . **spacecraft shielding**
  - RT aeroshells
  - heat shielding
  - ∞ insulated structures
  - meteoroid protection
  - nose cones
  - radiation shielding
  - radio frequency shielding
  - reentry shielding
  - reusable heat shielding
  - safety devices
  - solar radiation shielding

- spacecraft stability**
- UF *satellite attitude disturbance*
  - GS dynamic characteristics
  - . dynamic stability
  - . . motion stability
  - . . . **spacecraft stability**
  - stability
  - . dynamic stability
  - . . motion stability
  - . . . **spacecraft stability**
  - RT aerodynamic balance
  - aerodynamic stability
  - attitude stability
  - buffeting
  - control stability
  - counterbalances
  - directional stability
  - Discos (satellite attitude control)
  - dual spin spacecraft
  - lateral stability
  - liquid sloshing
  - longitudinal stability
  - low speed stability
  - nutaton dampers
  - satellite perturbation
  - tumbling motion
  - wind tunnel stability tests

- spacecraft sterilization**
- GS cleaning
  - . sterilization

- . . **spacecraft sterilization**
- decontamination
- . **spacecraft sterilization**
- RT chemical sterilization
- ethylene oxide
- exobiology
- planetary protection
- planetary quarantine
- purification
- sterilization effects

- spacecraft structures**
- RT aeroshells
  - aircraft structures
  - folding structures
  - fuel tanks
  - large space structures
  - meteoroid protection
  - orbital assembly
  - rocket engines
  - satellite design
  - smart structures
  - space erectable structures
  - space station structures
  - structural design
  - ∞ structures

- spacecraft survivability**
- DEF The ability of a spacecraft to survive adverse conditions including reentry problems.
  - RT aircraft survivability
  - spacecraft breakup
  - spacecraft defense
  - survival
  - uncontrolled reentry (spacecraft)
  - vulnerability

- spacecraft television**
- GS communication equipment
  - . **spacecraft television**
  - . . digital spacecraft television
  - . . Ranger block 3 television system
  - . . satellite television
  - telecommunication
  - . **spacecraft television**
  - . . digital spacecraft television
  - . . Ranger block 3 television system
  - . . satellite television
  - television systems
  - . **spacecraft television**
  - . . digital spacecraft television
  - . . Ranger block 3 television system
  - . . satellite television
  - RT color television
  - satellite transmission
  - stereotelevision
  - television transmission

- spacecraft temperature**
- GS **spacecraft temperature**
  - . satellite temperature
  - RT heat pipes
  - spacecraft design
  - temperature control

- spacecraft tracking**
- DEF The process of following the movements of a spacecraft or space platform by radar, optical, or other means.
  - GS tracking (position)
  - . **spacecraft tracking**
  - . . satellite tracking
  - . . . satellite-to-satellite tracking
  - RT Advanced Range Instrumentation Ship
  - Deep Space Network
  - minitrack system
  - missile tracking
  - optical tracking
  - polystation doppler tracking system
  - radar tracking
  - radio tracking
  - space detection and tracking system
  - space surveillance (ground based)
  - space surveillance (spaceborne)
  - tracking networks
  - tracking stations
  - transponder control group

unified S band

- Spacecraft Tracking and Data Network*
- USE **STDN (network)**

- spacecraft trajectories**
- GS trajectories
  - . **spacecraft trajectories**
  - . . interplanetary trajectories
  - . . . Earth-Mars trajectories
  - . . . Earth-Mercury trajectories
  - . . . Earth-Venus trajectories
  - . . lunar trajectories
  - . . . circumlunar trajectories
  - . . . Earth-Moon trajectories
  - . . . moon-Earth trajectories
  - RT ascent trajectories
  - descent trajectories
  - Earth orbital rendezvous
  - flight mechanics
  - Goddard Trajectory Determination System
  - hyperbolic trajectories
  - interorbital trajectories
  - lunar orbital rendezvous
  - ∞ motion
  - orbital rendezvous
  - radio occultation
  - reentry trajectories
  - rendezvous trajectories
  - round trip trajectories
  - swingby technique

- spacecrew transfer**
- UF *intervehicle spacecrew transfer*
  - RT Apollo Soyuz test project
  - command modules
  - manned space flight
  - rendezvous spacecraft
  - space logistics

- spacecrews**
- GS personnel
  - . crews
  - . . flight crews
  - . . . **spacecrews**
  - . flying personnel
  - . . flight crews
  - . . . **spacecrews**
  - RT astronauts
  - cosmonauts
  - crew experiment stations
  - crew observation stations
  - crew procedures (inflight)
  - crew procedures (preflight)
  - crew workstations
  - space habitats
  - toilets

- Spacelab**
- GS laboratories
  - . space laboratories
  - . . manned orbital laboratories
  - . . . **Spacelab**
  - manned spacecraft
  - manned orbital laboratories
  - . . **Spacelab**
  - payloads
  - . Space Shuttle payloads
  - . . **Spacelab**
  - RT Advanced Technology Laboratory
  - annular suspension and pointing system
  - EXPOS (Spacelab payload)
  - geophysical fluid flow cells
  - German Infrared Laboratory
  - Get Away Specials (STS)
  - GRIST (telescope)
  - LIRTS (telescope)
  - NASA programs
  - OSTA-2 payload
  - SEPAC (payload)
  - Skylab program
  - space shuttles
  - space transportation system
  - spaceborne experiments
  - Starlab

- Spacelab payloads**
- DEF A general, collective term for the di-

verse and numerous ESA payloads planned for space experiments.

- GS payloads
  - . **Spacelab payloads**
  - .. AMPS (satellite payload)
  - .. Atmospheric Cloud Physics Lab (Spacelab)
  - .. Atmospheric General Circulation Experiment
  - .. geophysical fluid flow cells
  - .. Solar Cell Calibration Facility
- RT annular suspension and pointing system
- Astro missions (STS)
- Get Away Specials (STS)
- sortie systems
- space station payloads

*Spacelab simulation flights*  
USE **Assess program**

*Spacelab UV-Optical Telescope Facility*  
USE **Starlab**

#### spacers

- RT bushings
- dividers
- fasteners
- inserts
- isolators
- separators
- spacing
- washers (spacers)

#### spacetenas

DEF The transmitting antennas of a solar power satellite transmission system which directs the high-power beam from space to a focus on the rectennas on Earth.

- GS antennas
  - . radio antennas
  - .. microwave antennas
  - ... **spacetenas**
- microwave equipment
  - . microwave antennas
  - .. **spacetenas**
- radio equipment
  - . radio antennas
  - .. microwave antennas
  - ... **spacetenas**
- RT microwave transmission rectennas

#### space-time adaptive processing

(added November 2002)

DEF Multidimensional filtering technique that reduces the effects of airborne radar clutter and white noise jamming by using the input from a phased-array antenna to produce an adaptive weight vector which can then be applied to the signal.

- UF *STAP (radar)*
- GS data processing
  - . signal processing
  - .. **space-time adaptive processing**
- RT adaptive filters
- airborne radar
- clutter
- interference immunity
- jamming
- radar detection
- radar filters
- surveillance radar

#### space-time CE/SE method

(added June 2002)

DEF A numerical framework used for solving conservation laws in continuum mechanics, where both local and global flux conservations are enforced in space and time. The method is characterized by low dispersion errors and low dissipation.

- UF *CE/SE method*
- conservation element and solution element*
- GS analysis (mathematics)
  - . numerical analysis
  - .. **space-time CE/SE method**
- RT aeroacoustics
- computational fluid dynamics

conservation equations  
conservation laws  
flow equations

*space-time continuum*  
USE **relativity**

#### space-time functions

- UF *space-time metric*
- GS functions (mathematics)
  - . **space-time functions**
- RT light-cone expansion
- Minkowski space
- naked singularities
- relativity
- Yang-Mills theory

*space-time metric*  
USE **space-time functions**

*spacewalks*  
(added April 2001)  
USE **extravehicular activity**

#### spacing

- GS **spacing**
  - . aircraft approach spacing
- RT altitude control
- attitude control
- clearances
- intervals
- isolation
- positioning
- ∞ separation
- spacers
- thickness

*SPADATS (tracking system)*  
USE **space detection and tracking system**

#### Spain

- GS nations
  - . **Spain**
  - .. Canary Islands
- RT Andorra
- Europe
- Gibraltar
- Pyrenees Mountains (Europe)
- Spanish Sahara
- Spanish space program

#### spallation

- GS nuclear radiation
  - . **spallation**
- nuclear reactions
- . **spallation**
- RT particle production

#### spalling

- DEF Spontaneous separation of a surface layer from a metal.
- RT chipping
- flaking
- fracturing
- fragmentation
- wear
- wear tests

#### ∞ span

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT aspect ratio
- dimensions
- life span
- width
- wing span

#### Spanish Sahara

- RT Africa
- nations
- Spain

#### Spanish space program

- (added March 1989)
- GS programs
  - . space programs
  - .. European space programs
  - ... **Spanish space program**

RT Spain

#### spanloader aircraft

DEF Advanced distributed-load cargo aircraft configurations in which the payloads are distributed across the span of the wing for a close match between aerodynamic and inertial loading for minimal bending stresses.

- GS transport aircraft
  - . cargo aircraft
  - .. **spanloader aircraft**
- RT ∞ aircraft
- supercritical wings
- swept wings

#### spanwise blowing

- GS blowing
  - . **spanwise blowing**
- RT cross flow
- externally blown flaps
- jet flow
- lift augmentation
- pressure distribution
- tangential blowing
- wing span

*SPAR (rocket)*

USE **Space Processing Applications Rocket**

#### spare parts

- RT ∞ components
- damage assessment
- downtime
- engine parts
- inventory management
- logistics management
- maintenance
- modules
- redundant components
- retirement for cause

#### spark chambers

- GS ionization chambers
  - . **spark chambers**
- measuring instruments
  - . counters
  - .. radiation counters
  - ... **spark chambers**
- . radiation measuring instruments
- .. radiation counters
- ... **spark chambers**
- RT bubble chambers
- ∞ chambers
- cloud chambers
- electric sparks
- neutron counters

*spark discharges*

USE **electric sparks**

#### spark gaps

- GS gaps
  - . **spark gaps**
- RT arc generators
- dielectrics
- electric fields
- electric sparks
- electrical faults
- multipactor discharges
- potential gradients
- trigatrons

#### spark ignition

- GS ignition
  - . **spark ignition**
- RT combustion
- electric ignition
- electric sparks
- eudiometers

#### spark machining

- UF *electroerosion*
- electrostatic erosion*
- GS cutting
  - . **spark machining**
- machining
- . **spark machining**
- RT electroforming
- erosion

## spark plugs

metal cutting  
piercing

### spark plugs

RT arc generators  
combustion chambers  
electric sparks  
igniters  
ignition systems  
internal combustion engines

*spark shadowgraph photography*

USE **shadowgraph photography**

### sparks

GS **sparks**  
. electric sparks  
RT ignition

### Sparrow 2 missile

GS missiles  
. air to air missiles  
. . Sparrow missiles  
. . . **Sparrow 2 missile**  
RT solid propellant rocket engines

### Sparrow 3 missile

GS missiles  
. air to air missiles  
. . Sparrow missiles  
. . . **Sparrow 3 missile**  
RT liquid propellant rocket engines

### Sparrow missiles

GS missiles  
. air to air missiles  
. . **Sparrow missiles**  
. . . Sparrow 2 missile  
. . . Sparrow 3 missile  
RT solid propellant rocket engines

### Spartan missile

GS missiles  
. antimissile missiles  
. . **Spartan missile**  
RT Nike-Zeus missile  
Sentinel system  
Sprint missile  
surface to air missiles

### Spartan satellites

GS artificial satellites  
. scientific satellites  
. . astronomical satellites  
. . . **Spartan satellites**  
observatories  
. astronomical observatories  
. . astronomical satellites  
. . . **Spartan satellites**  
RT astrophysics  
solar physics  
ultraviolet astronomy

*SPAS (ESA platforms)*

USE **Shuttle pallet satellites**

### spasms

GS muscular function  
. **spasms**  
RT contraction  
involuntary actions  
muscles

### spatial dependencies

GS dependence  
. **spatial dependencies**  
RT mathematical models  
∞ space  
time dependence

### spatial distribution

UF *Moliere formula*  
*spatial isotropy*  
GS distribution (property)  
. **spatial distribution**  
. . horizontal distribution  
. . vertical distribution  
. . . star distribution  
. . . geographic distribution  
RT anisotropy  
ion distribution

meteoroid concentration  
particle density (concentration)  
position (location)  
satellite constellations  
stereochemistry  
teleconnections (meteorology)  
temporal distribution  
Voronoi diagrams

### spatial filtering

GS filtration  
. **spatial filtering**  
RT aberration  
attenuation  
augmentation  
blurring  
∞ filters  
Gabor filters  
holography  
images  
∞ noise  
photographs  
photointerpretation  
plane waves  
resolution  
speckle holography

*spatial isotropy*

USE **isotropy**  
**spatial distribution**

### spatial marching

DEF Techniques for solving partial differential equations that move along in a space direction.  
RT acoustic ducts  
duct geometry  
numerical analysis  
time marching

*spatial orientation*

USE **attitude (inclination)**

### spatial resolution

DEF The precision with which an optical instrument can produce separable images of different points on an object.  
GS resolution  
. **spatial resolution**  
RT atmospheric correction  
high resolution  
image processing  
image resolution  
imaging techniques  
spectral resolution  
temporal resolution

*SPDL*

USE **document markup languages**

### species diffusion

GS diffusion  
. **species diffusion**  
RT biological diversity  
evolution (development)  
genetics  
geographic distribution

*specific gravity*

USE **density (mass/volume)**

### specific heat

DEF The ratio of the heat absorbed (or released) by unit mass of a system to the corresponding temperature rise (or fall). Used for Debye temperature and heat capacity.  
UF *Debye temperature*  
*heat capacity*  
GS heat  
. **specific heat**  
thermodynamic properties  
. thermophysical properties  
. . **specific heat**  
RT enthalpy  
equipartition theorem  
Gruneisen constant  
heat budget  
heat of fusion  
ion temperature  
Lewis numbers

melting points  
neel temperature  
thermal conductivity  
thermal resistance

### specific impulse

GS impulses  
. **specific impulse**  
RT mass flow rate  
propellant mass ratio  
propellants  
propulsion system performance  
propulsive efficiency  
rocket propellants  
rocket thrust  
thermodynamic efficiency  
thrust  
total impulse

### specifications

DEF Precise statements or sets of requirements to be satisfied by materials, products, systems, or services.  
GS **specifications**  
. aircraft specifications  
. equipment specifications  
. functional design specifications  
RT aircraft performance  
commonality  
drawings  
inspection  
maintenance  
∞ materials tests  
mechanical properties  
naming  
performance tests  
process control (industry)  
procurement  
quality  
quality control  
reliability  
requirements  
standardization  
standards  
technical writing  
tolerances (mechanics)  
user requirements

### specimen geometry

GS geometry  
. **specimen geometry**  
RT fatigue tests  
load tests  
mechanical properties  
tensile tests

### specimens

RT Mars surface samples  
samples  
sampling

### speckle holography

DEF An imaging technique whereby a speckle pattern results from laser illumination of a diffusely reflecting surface when interference occurs between the fields passing through the various portions of lens aperture. Information about the motion of an object can then be obtained from the imaged fringes resulting from the translation of two speckle patterns.  
GS imagery  
. photography  
. . holography  
. . . **speckle holography**  
imaging techniques  
. **speckle holography**  
RT coherent light  
diffraction patterns  
hologrammetry  
holographic interferometry  
image correlators  
laser applications  
scatter plates (optics)  
spatial filtering  
speckle interferometry  
speckle patterns

### speckle interferometry

DEF An imaging process whereby the pattern on the image plane of an interferometer is

the result of interference between two mutually coherent, but randomly speckled, fields of two, lens formed images from laser illuminated, diffusely reflecting surfaces.

- GS interferometry
- . **speckle interferometry**
- RT diffraction patterns
- Fresnel diffraction
- Fresnel reflectors
- infrared interferometers
- isochromatics
- laser applications
- null zones
- plasma flux measurement
- Sagnac effect
- scatter plates (optics)
- speckle holography

#### speckle patterns

- RT diffraction patterns
- holography
- laser outputs
- light scattering
- ∞ patterns
- speckle holography
- surface roughness effects

#### spectra

- UF *optical spectrum*
- GS **spectra**
- . atomic spectra
- . continuous spectra
- . energy spectra
- . . . electronic spectra
- . . . neutron spectra
- . mass spectra
- . molecular spectra
- . . . electronic spectra
- . . . Raman spectra
- . . . rotational spectra
- . . . vibrational spectra
- . noise spectra
- . oxygen spectra
- . plasma spectra
- . power spectra
- . . . cepstra
- . radiation spectra
- . . . absorption spectra
- . . . . Fraunhofer lines
- . . . . Herzberg bands
- . . . . telluric lines
- . . . electromagnetic spectra
- . . . gamma ray spectra
- . . . infrared spectra
- . . . line spectra
- . . . . Balmer series
- . . . . . D lines
- . . . . . electronic spectra
- . . . . . Fraunhofer lines
- . . . . . H lines
- . . . . . . H alpha line
- . . . . . . H beta line
- . . . . . . H gamma line
- . . . . . K lines
- . . . . Lyman spectra
- . . . . Paschen series
- . . . . Rydberg series
- . . . . telluric lines
- . . . radio spectra
- . . . . microwave spectra
- . . . Raman spectra
- . . . stellar spectra
- . . . . solar spectra
- . . . . . UVB spectra
- . . . . ultraviolet spectra
- . . . . vibrational spectra
- . . . visible spectrum
- . . . x ray spectra
- . . emission spectra
- . shock spectra
- . spectral bands
- . . absorption spectra
- . . . Fraunhofer lines
- . . . Herzberg bands
- . . . telluric lines
- . . diffuse interstellar bands
- . . photoluminescent bands
- . . Schumann-Runge bands
- . . Swan bands

- . . Vegard-Kaplan bands
- RT astronomical spectroscopy
- color
- excitons
- flux density
- gamma ray spectrometers
- isoelectronic sequence
- spectral sensitivity
- spectral shift control
- spectral theory
- spectrograms
- spectrographs
- spectrometers
- spectroscopy
- spectrum analysis
- transition probabilities

#### *spectral absorption*

- USE **absorption spectra**

#### *spectral analysis*

- USE **spectrum analysis**

#### spectral bands

- GS spectra
- . **spectral bands**
- . . absorption spectra
- . . . Fraunhofer lines
- . . . Herzberg bands
- . . . telluric lines
- . . diffuse interstellar bands
- . . photoluminescent bands
- . . Schumann-Runge bands
- . . Swan bands
- . . Vegard-Kaplan bands
- RT band ratioing
- ∞ bands
- electronic spectra
- energy bands
- frequencies
- line spectra
- visible spectrum
- white noise

#### spectral correlation

- GS correlation
- . **spectral correlation**
- RT electromagnetic spectra
- spectrophotography

#### spectral counterparts (astronomy)

- (*added August 2005*)
- DEF Corresponding radiation sources of different spectral regions that are believed to be associated with the same astronomical object.
- RT gamma ray sources (astronomy)
- radiation sources
- radio sources (astronomy)
- Swift observatory
- x ray sources

#### spectral emission

- GS emission
- . **spectral emission**
- RT continuous spectra
- electromagnetic radiation
- emittance
- incandescence
- light emission
- line spectra
- nongray gas
- ∞ radiation
- spectrograms
- spectroscopy
- spectrum analysis
- spontaneous emission
- ultraviolet emission
- wavelengths

#### spectral energy distribution

- GS distribution (property)
- . energy distribution
- . . **spectral energy distribution**
- RT ∞ distribution
- electromagnetic radiation
- energy spectra
- fine structure

line spectra

#### spectral line width

- GS bandwidth
- . **spectral line width**
- RT line spectra
- oscillator strengths

#### *spectral lines*

- USE **line spectra**

#### spectral methods

- RT computational fluid dynamics
- differential equations
- ∞ methodology
- spectrum analysis

#### spectral mixture analysis

- (*added July 2000*)
- DEF Linear algebraic method for defining subpixel fractions for each of the spectral end-members (e.g., ground cover categories) that constitute a mixed-pixel spectral signature.
- UF *SMA (image analysis)*
- GS discrimination
- . **spectral mixture analysis**
- image analysis
- . **spectral mixture analysis**
- spectrum analysis
- . **spectral mixture analysis**
- RT image processing
- pixels
- principal components analysis
- remote sensing
- spectral reflectance

#### *spectral noise*

- USE **white noise**

#### spectral reconnaissance

- GS reconnaissance
- . **spectral reconnaissance**
- RT Earth resources
- electromagnetic spectra
- multispectral band scanners
- multispectral photography
- multispectral radar
- photoreconnaissance
- radar photography
- satellite-borne photography
- spectrophotography

#### spectral reflectance

- DEF The ratio of the reflected flux to the spectrally homogeneous incident flux.
- GS electromagnetic properties
- . optical properties
- . . reflectance
- . . . **spectral reflectance**
- surface properties
- . **spectral reflectance**
- RT bidirectional reflectance
- imaging spectrometers
- leaf area index
- plant stress
- spectral mixture analysis
- spectrometers
- spectroscopy
- spectrum analysis
- vegetative index

#### spectral resolution

- GS resolution
- . **spectral resolution**
- RT analog computers
- Landsat 6
- Landsat 7
- line spectra
- Q factors
- radar resolution
- radiometric resolution
- spatial resolution
- spectrum analysis

#### *spectral response*

- (*added August 2000*)
- USE **spectral sensitivity**

#### spectral sensitivity

- DEF In electronics, radiant sensitivity con-

## spectral shift control

sidered as a function of wavelength, or in physics, the response of a device or material to monochromatic light as a function of wavelength; also known as spectral response.

UF *spectral response*

GS sensitivity  
. **spectral sensitivity**

RT frequency response  
instrument errors  
photothermal conversion  
spectra

### spectral shift control

DEF Type of reactor moderator control in which the neutron spectrum is intentionally changed.

RT  $\infty$  control  
spectra

### spectral shift control reactor

GS nuclear reactors  
. liquid cooled reactors  
. . . water cooled reactors  
. . . pressurized water reactors  
. . . . **spectral shift control reactor**

RT  $\infty$  control

### spectral signatures

GS signatures  
. **spectral signatures**  
. . . microwave signatures

RT cepstral analysis  
chemical analysis  
chemical composition  
crop identification  
emission spectra  
identifying  
optical measurement  
spectrum analysis

### spectral theory

RT Lyman spectra  
spectra  
 $\infty$  theories

### spectrograms

RT line spectra  
spectra  
spectral emission  
spectrograms  
spectrophotography  
spectroscopy  
spectrum analysis

### spectrographs

GS **spectrographs**  
. high dispersion spectrographs

RT spectra  
spectrograms  
spectrometers  
spectroscopic analysis  
spectroscopy

### spectroheliographs

DEF Instruments for taking photographs (spectroheliograms) of the image of the sun in monochromatic light. The wavelength of light chosen for this purpose corresponds to one of the Fraunhofer lines, usually the light of hydrogen or ionized calcium. Used for heliographs, heliography, and spectrohelioscopes.

UF *heliographs*  
*heliography*  
*spectrohelioscopes*

GS imagery  
. **spectroheliographs**  
measuring instruments  
. radiation measuring instruments  
. . . actinometers  
. . . **spectroheliographs**  
. spectrometers  
. . . **spectroheliographs**  
optical equipment  
. **spectroheliographs**  
solar instruments  
. **spectroheliographs**

RT black and white photography  
coronagraphs  
solar spectrometers

Starsat telescope

### spectrohelioscopes

USE **spectroheliographs**

### spectrometers

UF *spectroscopes*

GS measuring instruments  
. **spectrometers**  
. . Ebert spectrometers  
. . Fabry-Perot spectrometers  
. . gamma ray spectrometers  
. . imaging spectrometers  
. . infrared spectrometers  
. . . filter wheel infrared spectrometers  
. . laser spectrometers  
. . mass spectrometers  
. . microwave spectrometers  
. . neutron spectrometers  
. . Solar Backscatter UV Spectrometer  
. . solar spectrometers  
. . spectroheliographs  
. . time of flight spectrometers  
. . ultraviolet spectrometers  
. . . high dispersion spectrographs  
. . . Total Ozone Mapping Spectrometer  
. . Alpha Magnetic Spectrometer  
. . x ray spectrometers

RT actinometers  
chemical analysis  
diffractometers  
electron probes  
goniometers  
infrared spectroscopy  
Michelson interferometers  
optical equipment  
optical measurement  
photogoniometers  
photographic measurement  
photometers  
radiation counters  
solar instruments  
spectra  
spectral reflectance  
spectrographs  
spectroradiometers  
spectroscopic analysis  
spectroscopy  
spectrum analysis

### spectrometry

USE **spectroscopy**

### spectrophotography

GS imagery  
. photography  
. . **spectrophotography**  
spectroscopy  
. **spectrophotography**

RT black and white photography  
ground truth  
spectral correlation  
spectral reconnaissance  
spectrograms

### spectrophotometers

GS measuring instruments  
. optical measuring instruments  
. . **spectrophotometers**  
. . . infrared spectrophotometers  
. . . ultraviolet spectrophotometers  
. radiation measuring instruments  
. . actinometers  
. . . **spectrophotometers**  
. . . . infrared spectrophotometers  
. . . . ultraviolet spectrophotometers  
optical equipment  
. optical measuring instruments  
. . **spectrophotometers**  
. . . infrared spectrophotometers  
. . . ultraviolet spectrophotometers

RT chemical analysis  
duochromators  
monochromators  
optical measurement  
photometers  
radiometers  
spectroradiometers

spectroscopic analysis  
spectroscopy

### spectrophotometry

GS optical measurement  
. photometry  
. . **spectrophotometry**  
. . . stellar spectrophotometry  
spectroscopy  
. **spectrophotometry**  
. . stellar spectrophotometry

RT astronomical photometry  
colorimetry  
imaging spectrometers  
spectroscopic analysis

### spectrophotovoltaics

DEF The enhancement of solar cell productivity by concentrating and subdividing the sunlight spectrum and focusing on specific spectrum efficient solar cells.

RT energy conversion efficiency  
energy spectra  
solar cells  
solar collectors

### spectropolarimeters

USE **polarimeters**

### spectroradiometers

GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . radiometers  
. . . . **spectroradiometers**  
. . . . MISR (radiometry)  
. . . . MODIS (radiometry)

RT spectrometers  
spectrophotometers

### spectroscopes

USE **spectrometers**

### spectroscopic analysis

SN (FOR SPECTROSCOPIC TOOLS IN CHEMICAL ANALYSIS)

GS chemical tests  
. chemical analysis  
. . **spectroscopic analysis**  
spectroscopy  
. **spectroscopic analysis**

RT Auger spectroscopy  
auroral spectroscopy  
electrophotometry  
flame spectroscopy  
Fraunhofer line discriminators  
gas spectroscopy  
inductively coupled plasma mass spectrometry  
infrared spectroscopy  
laser spectroscopy  
laser-induced breakdown spectroscopy  
magnetic spectroscopy  
mass spectroscopy  
metallicity  
microanalysis  
molecular spectroscopy  
neutron activation analysis  
nuclear radiation spectroscopy  
photoelectron spectroscopy  
qualitative analysis  
quantitative analysis  
Raman spectroscopy  
spectrographs  
spectrometers  
spectrophotometers  
spectrophotometry  
ultraviolet spectroscopy  
vacuum spectroscopy  
x ray spectroscopy

### spectroscopic telescopes

UF *diffraction telescopes*

GS telescopes  
. **spectroscopic telescopes**  
. . multispectral tracking telescopes  
. . stratoscope telescopes

RT astronomical spectroscopy  
reflecting telescopes

- refracting telescopes  
stellar spectrophotometry
- spectroscopy**  
UF *spectrometry*  
GS **spectroscopy**  
. absorption spectroscopy  
. . . optogalvanic spectroscopy  
. astronomical spectroscopy  
. . . stellar spectrophotometry  
. Auger spectroscopy  
. auroral spectroscopy  
. electron spectroscopy  
. flame spectroscopy  
. gas spectroscopy  
. holographic spectroscopy  
. infrared spectroscopy  
. ion mobility spectroscopy  
. laser-induced breakdown spectroscopy  
. magnetic spectroscopy  
. . . magnetic resonance spectroscopy  
. mass spectroscopy  
. . . inductively coupled plasma mass spectrometry  
. . . secondary ion mass spectrometry  
. molecular spectroscopy  
. . . Raman spectroscopy  
. nuclear radiation spectroscopy  
. optical emission spectroscopy  
. . . laser spectroscopy  
. . . . optogalvanic spectroscopy  
. photoacoustic spectroscopy  
. photoelectron spectroscopy  
. radio spectroscopy  
. spectrophotography  
. spectrophotometry  
. . . stellar spectrophotometry  
. photothermal deflection spectroscopy  
. spectroscopic analysis  
. ultrasonic spectroscopy  
. ultraviolet spectroscopy  
. vacuum spectroscopy  
. x ray spectroscopy
- RT chemical analysis  
cinespectrographs  
colorimetry  
electrophotometry  
Fraunhofer line discriminators  
isoelectronic sequence  
Lallemand cameras
- ∞ optics  
photometry  
pressure broadening  
spectra  
spectral emission  
spectral reflectance  
spectrograms  
spectrographs  
spectrometers  
spectrophotometers  
spectrum analysis  
time of flight spectrometers  
visible spectrum  
x ray spectrometers  
Zeeman effect
- spectrum analysis**  
UF *spectral analysis*  
GS **spectrum analysis**  
. cepstral analysis  
. flame spectroscopy  
. maximum entropy method  
. spectral mixture analysis
- RT absorption spectra
- ∞ analyzing  
emission spectra  
frequency analyzers  
frequency scanning  
gamma ray spectrometers  
holographic spectroscopy  
hyperfine structure  
Kramers-Kronig formula  
laser spectroscopy  
line spectra  
magnetic resonance  
optical resonance  
signal analysis
- spectra  
spectral emission  
spectral methods  
spectral reflectance  
spectral resolution  
spectral signatures  
spectrograms  
spectrometers  
spectroscopy  
Stark effect  
toroidal discharge  
ultrasonic spectroscopy  
ultraviolet spectroscopy  
Zeeman effect
- specular reflection**  
DEF Reflection in which the reflected radiation is not diffused; reflection as from a mirror.  
GS reflection  
. **specular reflection**  
RT diffuse radiation  
etalons  
glare  
mirrors
- speech**  
GS **speech**  
. articulation (speech)  
. conversation  
. phonemes  
. phonetics  
. talking  
RT acoustics  
auditory perception  
consonants (speech)  
English language  
languages  
lectures  
linguistics  
phonemics  
public speaking  
semantics  
sentences  
syntax  
voice  
voice communication  
words (language)
- speech baseband compression**  
DEF Technique for reducing the bandwidth required to represent the human voice waveform.  
GS compressing  
. **speech baseband compression**  
RT bandwidth  
vocoders  
voice communication  
waveforms
- speech defects**  
GS defects  
. **speech defects**  
RT articulation (speech)  
phonemics  
phonetics
- speech discrimination*  
USE **speech recognition**
- speech recognition**  
UF *speech discrimination*  
GS intelligibility  
. **speech recognition**  
recognition  
. **speech recognition**  
RT cepstral analysis  
linguistics  
phonemes  
phonemics  
phonetics  
sensory discrimination  
voice control
- speeches*  
USE **lectures**
- speed*  
USE **velocity**
- speed control**  
UF *speed regulation*
- RT automatic control  
∞ control  
control equipment  
controllers  
engine control  
helicopter control  
manual control  
regulators
- speed indicators**  
UF *Preston tubes*  
*speedometers*  
GS display devices  
. **speed indicators**  
. . tachometers  
measuring instruments  
. indicating instruments  
. . **speed indicators**  
. . . tachometers  
RT accelerometers  
aircraft instruments  
anemometers  
approach indicators  
flight instruments  
flowmeters  
landing instruments  
pitot tubes  
velocity measurement
- speed regulation*  
USE **speed control**
- speed regulators**  
UF *governors*  
GS control equipment  
. regulators  
. . **speed regulators**  
RT controllers  
engines
- speedometers*  
USE **speed indicators**
- spent fuels**  
DEF Nuclear reactor fuels irradiated to the extent that they no longer can effectively sustain a chain reaction.  
GS fuels  
. nuclear fuels  
. . **spent fuels**  
RT fuel capsules  
neutron sources  
∞ nuclear energy  
nuclear fuel reprocessing  
reactor materials  
recycling
- spermatocytes*  
USE **gametocytes**
- spermatogenesis**  
RT abiogenesis  
gametocytes  
spermatozoa
- spermatozoa**  
GS cells (biology)  
. gametocytes  
. . **spermatozoa**  
RT fertilization  
spermatogenesis  
zygotes
- Spert reactors**  
GS nuclear reactors  
. liquid cooled reactors  
. . water cooled reactors  
. . . boiling water reactors  
. . . . **Spert reactors**  
. nuclear research and test reactors  
. . **Spert reactors**
- SPF (materials)*  
USE **superplastic forming**
- sphalerite*  
USE **zincblende**
- spheres**  
GS symmetrical bodies  
. bodies of revolution

## spherical antennas

- . . . **spheres**
- . . . . celestial sphere
- . . . . concentric spheres
- . . . . falling spheres
- . . . . Poincaré spheres
- . . . . rotating spheres
- RT aerodynamic configurations
- asphericity
- balls
- circles (geometry)
- Euclidean geometry
- geometry
- ∞ globes
- globules
- ∞ hemispheres
- hemispherical shells
- microballoons
- nodules
- ogives
- spherical shells
- spheroids
- spherules

### spherical antennas

- GS antennas
- . **spherical antennas**
- RT communication equipment
- electronic equipment

### spherical caps

- GS shells (structural forms)
- . spherical shells
- . . . **spherical caps**
- RT ∞ caps
- coverings
- nose cones
- seals (stoppers)

### spherical coordinates

DEF A system of curvilinear coordinates in which the position of a point in space is designated by its distance from the origin or pole (the radius vector), the angle phi between the radius vector and a vertically directed polar axis (the cone angle or colatitude) and the angle theta between the plane of the phi and a fixed meridian plane through the polar axis (the polar angle or longitude). Used for curvilinear coordinates.

- UF *curvilinear coordinates*
- GS coordinates
- . **spherical coordinates**
- RT astronomical coordinates
- celestial reference systems
- geocentric coordinates
- planetocentric coordinates
- polar coordinates
- position (location)
- ∞ reference systems

### spherical harmonics

- GS analysis (mathematics)
- . complex variables
- . . . **spherical harmonics**
- functions (mathematics)
- . **spherical harmonics**
- harmonics
- . **spherical harmonics**
- RT Legendre functions

### spherical plasmas

- DEF Confined circular plasmas.
- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **spherical plasmas**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . **spherical plasmas**

### spherical shells

- GS shells (structural forms)
- . **spherical shells**
- . . spherical caps
- RT bodies of revolution
- circular shells
- hemispherical shells
- metal shells
- reinforced shells

- rotating spheres
- spheres
- stressed-skin structures
- thin walled shells

### spherical tanks

- GS tanks (containers)
- . **spherical tanks**
- RT fuel tanks
- pressure vessels
- propellant tanks
- storage tanks

### spherical waves

- RT cylindrical waves
- diffraction paths
- diffraction propagation
- elastic waves
- electromagnetic radiation
- Huygens principle
- plane waves
- point sources
- three dimensional flow
- ∞ waves

### spheroids

- DEF Ellipsoids; figure resembling spheres.
- GS geometry
- . Euclidean geometry
- . . analytic geometry
- . . . **spheroids**
- . . . . oblate spheroids
- . . . . prolate spheroids
- RT falling spheres
- geoids
- spheres

### spheromaks

- DEF Toroidal fusion reactors.
- GS nuclear reactors
- . fusion reactors
- . . **spheromaks**
- RT dense plasmas
- magnetic field configurations
- magnetic mirrors
- plasma control
- plasma currents
- ∞ reactors
- tokamak devices
- toroidal plasmas

### spherules

- GS **spherules**
- . spherulites
- RT crystals
- spheres

### spherulites

- GS crystals
- . crystallites
- . . **spherulites**
- spherules
- . **spherulites**
- RT crystal structure
- microcrystals
- microstructure
- nodules
- rosette shapes

### SPHINX

- SN (SPACE PLASMA HIGH VOLTAGE INTERACTION EXPERIMENTS)
- UF *space plasma H/V interaction experiments*
- RT NASA programs
- plasma interaction experiment
- plasma-particle interactions
- plasmas (physics)
- ∞ research projects
- space plasmas

### sphygmography

- RT arteries
- bioinstrumentation
- blood pressure
- heart rate
- ∞ measurement
- recording instruments

### spicules

- DEF Bright spikes extending into the chro-

- mosome of the sun from below.

- GS stellar activity
- . solar activity
- . . **spicules**
- RT chromosphere
- photosphere
- solar atmosphere

### spiders

- GS animals
- . invertebrates
- . . arthropods
- . . . **spiders**

### spike antennas

- USE **monopole antennas**

### spike nozzles

- GS exhaust nozzles
- . **spike nozzles**
- RT aerospike engines
- conical nozzles
- nozzle geometry
- ∞ nozzles
- plug nozzles
- rocket nozzles
- ∞ spikes

### spike potentials

- GS potential energy
- . electric potential
- . . **spike potentials**
- RT bioelectricity
- depolarization
- ∞ spikes

### ∞ spikes

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT fasteners
- holders
- monopole antennas
- pins
- spike nozzles
- spike potentials
- spikes (aerodynamic configurations)

### spikes (aerodynamic configurations)

- RT ∞ spikes
- wind tunnels

### spiking

- RT electron beam welding
- melting
- metal cutting

### spilling

- RT dumping
- emptying
- jettisoning
- oil slicks
- releasing
- spreading

### spin

- GS **spin**
- . metal spinning
- . . hydrospinning
- . particle spin
- . . electron spin
- . . isotopic spin
- . . nuclear spin
- . spin-orbit interactions
- . . electron capture
- . spin-spin coupling
- RT angular momentum
- nuclear capture
- ∞ spinners
- yo-yo devices

### spin decoupling

- GS decoupling
- . **spin decoupling**
- RT photomagnetic effects

### spin dynamics

- RT aircraft spin
- artificial gravity
- dynamic tests
- ∞ dynamics

electron spin  
gyration  
lunar rotation  
rotating matter

**spin exchange**

GS exchanging  
. **spin exchange**  
RT resonance charge exchange

*spin forging*

USE **metal spinning**

**spin glass**

DEF A magnetic alloy in which the concentration of magnetic atoms is such that below a certain temperature their magnetic moments are no longer able to fluctuate thermally in time but are still directed at random in loose analogy to the atoms of ordinary glass.

GS glass  
. **spin glass**  
RT amorphous materials  
magnetic properties  
metallic glasses  
spin-lattice relaxation  
superconductivity

**spin reduction**

UF *despinning*  
*jet damping*  
GS rates (per time)  
. acceleration (physics)  
. . deceleration  
. . . **spin reduction**  
RT angular acceleration  
destabilization  
gravity gradient satellites  
∞ reduction  
satellite rotation  
yo-yo devices

**spin resonance**

GS resonance  
. **spin resonance**  
RT nuclear magnetic resonance  
particle spin

**spin stabilization**

DEF Directional stability of a spacecraft obtained by the action of gyroscopic forces which result from spinning the body about its axis of symmetry.

GS stabilization  
. **spin stabilization**  
RT attitude control  
coning motion  
dual spin spacecraft  
missiles  
OV-1 satellites  
OV-2 satellites  
OV-3 satellites  
OV-4 satellites  
OV-5 satellites  
satellite orientation  
satellite rotation  
Space Shuttle upper stage D  
space stations  
∞ spinners

**spin temperature**

SN (LIMITED TO ASTROPHYSICS)  
GS temperature  
. **spin temperature**  
RT absorption spectra  
astrophysics  
hydrogen clouds  
interstellar gas  
interstellar matter

**spin tests**

UF *whirling tests*  
RT angular momentum  
dynamic tests  
environmental tests  
load tests  
polarization (spin alignment)  
∞ tests

whirl towers

*spin waves*

USE **magnons**

**spinach**

GS farm crops  
. **spinach**  
plants (botany)  
. **spinach**  
vegetables  
. **spinach**  
RT ∞ food

**spinal cord**

GS anatomy  
. nervous system  
. . central nervous system  
. . . **spinal cord**  
RT bones  
brain  
neuroglia  
spinal cord injuries  
spine

**spinal cord injuries**

(added August 2004)

DEF Penetrating and non-penetrating injuries to the spinal cord resulting from traumatic external forces.

GS injuries  
. **spinal cord injuries**  
RT back injuries  
spinal cord  
spine  
whiplash injuries

**spindles**

RT shafts (machine elements)  
spools  
winding

**spine**

UF *vertebral column*  
GS anatomy  
. musculoskeletal system  
. . bones  
. . . **spine**  
. . . . vertebrae  
RT sciatic region  
spinal cord  
spinal cord injuries

**spinel**

GS minerals  
. **spinel**  
RT aluminates  
ferrites  
igneous rocks

**spin-lattice relaxation**

GS magnetic properties  
. magnetic relaxation  
. . **spin-lattice relaxation**  
relaxation (mechanics)  
. **spin-lattice relaxation**  
RT lattice vibrations  
nuclear magnetic resonance  
relaxation time  
spin glass

∞ **spinners**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT antenna components  
fairings  
slewing  
spin  
spin stabilization

*spinning (metallurgy)*

USE **metal spinning**

**spinning solid upper stage**

DEF Space Shuttle upper stage designed for launching of satellites not requiring the full capacity of the interim upper stage; does not require inertial guidance system nor three-axis stabilization; can handle payloads of the class now launched by Delta or Atlas/ Centaur.

GS Space Shuttle upper stages  
. **spinning solid upper stage**  
RT booster rocket engines  
upper stage rocket engines

**spinning unguided rocket trajectory**

UF *SPURT (trajectories)*  
GS trajectories  
. **spinning unguided rocket trajectory**  
RT equations of motion  
missile trajectories  
rotating bodies  
symmetrical bodies

**spinor groups**

GS algebra  
. lie groups  
. . **spinor groups**  
geometry  
. differential geometry  
. . lie groups  
. . . **spinor groups**

**spin-orbit interactions**

GS nuclear reactions  
. nuclear interactions  
. . **spin-orbit interactions**  
. . . electron capture  
particle interactions  
. nuclear interactions  
. . **spin-orbit interactions**  
. . . electron capture  
spin  
. **spin-orbit interactions**  
. . electron capture  
RT ∞ interactions

**spin-spin coupling**

GS coupling  
. **spin-spin coupling**  
spin  
. **spin-spin coupling**  
RT couples  
cross relaxation

**spiral antennas**

GS antennas  
. **spiral antennas**  
. . log spiral antennas  
RT antenna design  
broadband  
telemetry

**spiral bevel gears**

(added May 1999)  
GS gears  
. bevel gears  
. . **spiral bevel gears**

**spiral galaxies**

GS celestial bodies  
. galaxies  
. . **spiral galaxies**  
. . . Andromeda Galaxy  
. . . barred galaxies  
. . . Milky Way Galaxy  
RT corotation  
density wave model  
disk galaxies  
elliptical galaxies  
galactic bulge  
galactic halos  
local group (astronomy)  
Maffei galaxies  
peculiar galaxies  
ring galaxies  
Seyfert galaxies  
Tully-Fisher relation  
Virgo galactic cluster

**spiral wrapping**

RT composite materials  
composite wrapping  
isotensoid structures  
packaging  
∞ spirals



## spirals

winding

### ∞ spirals

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT curves (geometry)

∞ helices

spiral wrapping

spirals (concentrators)

### spirals (concentrators)

GS concentrators

. spirals (concentrators)

separators

. spirals (concentrators)

RT classifiers

∞ spirals

### spirometers

RT heart minute volume

lungs

respiratory rate

### Spitsbergen (Norway)

RT archipelagoes

Arctic Ocean

ocean currents

### Spitzer Space Telescope

(added December 2003)

USE Space Infrared Telescope Facility

### splashing

UF swash

RT agitation

surface waves

ullage

water landing

### spleen

GS anatomy

. immune systems

. . lymphatic system

. . . spleen

RT polycythemia

### splicing

RT fasteners

∞ joining

∞ tapes

wiring

### spline functions

GS functions (mathematics)

. spline functions

RT approximation

matrix methods

### splines

RT couplings

fasteners

holders

### splints

RT bones

casts

first aid

### split flaps

GS airfoils

. flaps (control surfaces)

. . split flaps

brakes (for arresting motion)

. aerodynamic brakes

. . split flaps

. aircraft brakes

. . split flaps

control surfaces

. flaps (control surfaces)

. . split flaps

drag devices

. aerodynamic brakes

. . split flaps

RT jet flaps

leading edge slats

trailing edge flaps

wing flaps

### splits (geology)

USE geological faults

### splitting

GS splitting

. flux difference splitting

. flux vector splitting

. water splitting

RT chipping

cutting

fission

flaking

fracturing

laser cutting

∞ separation

slicing

### spodumene

GS aluminum compounds

. spodumene

chalcogenides

. oxides

. . silicon oxides

. . . spodumene

lithium compounds

. spodumene

minerals

. spodumene

silicon compounds

. silicates

. . sodium silicates

. . . spodumene

. silicon oxides

. . spodumene

sodium compounds

. sodium silicates

. . spodumene

### spoiler slot ailerons

GS airfoils

. ailerons

. . spoiler slot ailerons

control surfaces

. ailerons

. . spoiler slot ailerons

RT spoilers

### spoilers

DEF Plates, series of plates, combs, tubes, bars, or other devices that project into the airstream about bodies to break up or spoil the smoothness of the flow, especially such devices that project from the upper surface of an airfoil, giving increased drag and decreased lift.

GS airfoils

. spoilers

control surfaces

. spoilers

drag devices

. spoilers

RT aerodynamic brakes

boundary layer control

deflectors

flaps (control surfaces)

gust alleviators

leading edge slats

spoiler slot ailerons

vortex alleviation

wings

### spokes

RT hubs

wheels

### sponges (materials)

SN (ORGANIC OPEN-CELL STRUCTURES)

RT elastomers

∞ materials

polyurethane foam

porous materials

### spontaneous combustion

UF autoignition

self ignition

GS combustion

. spontaneous combustion

RT combustion temperature

explosions

fire point

fire prevention

flammability

flash point

fuel combustion

hazards

hypergolic rocket propellants

ignition

ignition temperature

propellant sensitivity

pyrophoric materials

### spontaneous emission

GS emission

. spontaneous emission

RT atomic energy levels

electromagnetic radiation

emission spectra

spectral emission

### spools

RT ∞ containers

inserts

magazines (supply chambers)

reels

spindles

### sporadic E layer

GS Earth atmosphere

. upper atmosphere

. . Earth ionosphere

. . . E region

. . . . sporadic E layer

regions

. E region

. . sporadic E layer

RT E-1 layer

E-2 layer

midlatitude atmosphere

### sporadic meteoroids

SN (METEORIODS NOT ASSOCIATED WITH A METEOROID SHOWER OR STREAM)

GS celestial bodies

. meteoroids

. . sporadic meteoroids

RT meteor trails

meteoroid concentration

### spores

DEF The reproductive elements of the lower forms of living organisms, usually unicellular.

GS spores

. microspores

RT biological weapons

fungi

microorganisms

plants (botany)

protozoa

tetrad theory

### sports medicine

GS medical science

. sports medicine

RT aerospace medicine

athletes

clinical medicine

exercise physiology

physical fitness

physiological effects

### SPOT (French satellite)

DEF French satellite with high visible resolution for observations of the Earth. It was launched in February 1986. The acronym is derived from the French, Satellite Pour Observation de la Terre.

GS artificial satellites

. French satellites

. . SPOT (French satellite)

RT crop identification

Earth observations (from space)

Earth resources

land use

mapping

soil mapping

stereophotography

### spot welds

GS joints (junctions)

. metal joints

. . . welded joints  
 . . . **spot welds**  
 RT arc welding  
 beads  
 electric welding  
 fusion welding  
 pressure welding  
 ultrasonic welding

**spray characteristics**  
 RT ∞ characteristics  
 sprayers  
 spraying

**spray condensers**  
 RT jet condensers  
 sprayers

**spray ingestion**  
 RT gas turbines  
 landing gear  
 salt spray tests

**spray nozzles**  
 RT annular nozzles  
 conical nozzles  
 fuel injection  
 fuel systems  
 injectors  
 ∞ nozzles  
 orifices  
 sprayers

**sprayed coatings**  
 UF *sprayed protective coatings*  
 GS coatings  
 . **sprayed coatings**  
 RT ceramic coatings  
 finishes  
 HVOF thermal spraying  
 lacquers  
 metal coatings  
 paints  
 plasma spraying  
 plastic coatings  
 primers (coatings)  
 protective coatings  
 varnishes

*sprayed protective coatings*  
 USE **protective coatings**  
**sprayed coatings**

**sprayers**  
 UF *spraying apparatus*  
*sprays*  
 RT atomizers  
 blowers  
 colloidal generators  
 contactors  
 ∞ containers  
 ∞ diffusers  
 dispensers  
 distributors  
 drops (liquids)  
 ejectors  
 fuel sprays  
 ∞ jets  
 materials handling  
 mixers  
 ∞ nozzles  
 propellant sprays  
 spray characteristics  
 spray condensers  
 spray nozzles  
 spraying  
 vaporizers

**spraying**  
 GS **spraying**  
 . arc spraying  
 . crop dusting  
 . flame spraying  
 . . HVOF thermal spraying  
 . metal spraying  
 . plasma spraying  
 RT aeration  
 aerosols  
 atomizing  
 blowing

coating  
 coatings  
 diffusion  
 dispersing  
 entrainment  
 forming techniques  
 fumigation  
 liquid atomization  
 metallizing  
 mixing  
 premixing  
 sealing  
 spray characteristics  
 sprayers  
 sprinkling  
 vaporizing  
 wetting

*spraying apparatus*  
 USE **sprayers**

*sprays*  
 USE **sprayers**

**spread F**  
 RT F 2 region  
 ionospheric storms  
 magnetic storms

**spread reflection**  
 DEF Reflection of electromagnetic radiation from a rough surface with large irregularities. Also known as mixed reflection.

GS reflection  
 . **spread reflection**  
 RT glare  
 infrared reflection  
 optical reflection  
 scattering  
 signal reflection  
 ultraviolet reflection  
 wave reflection

**spread spectrum transmission**  
 DEF Communications technique with many different signal waveforms transmitted in a wide band; power is spread thinly over the band so that narrow-band radios can operate within the band without interference.

GS transmission  
 . electromagnetic wave transmission  
 . . radio transmission  
 . . . **spread spectrum transmission**  
 . signal transmission  
 . . radio transmission  
 . . . **spread spectrum transmission**  
 RT communication  
 frequency hopping

**spreading**  
 RT adhesion  
 cohesion  
 diffusion  
 dispersing  
 disposal  
 dumping  
 emptying  
 interfacial tension  
 internal pressure  
 materials handling  
 scattering  
 ∞ separation  
 spilling  
 swelling  
 throwing  
 unloading

**spreadsheets**  
 (added March 2001)  
 DEF Software applications that present a display of multiple columns and rows, and allow a user to input and manipulate numerical data for planning, tracking, analysis, and financial calculations.  
 GS computer programs  
 . applications programs (computers)  
 . . **spreadsheets**  
 RT computer techniques

tables (data)

**spring (season)**  
 DEF The season of the year between winter and summer. Its beginning is the vernal equinox and its end the summer solstice.  
 GS seasons  
 . **spring (season)**  
 RT autumn  
 summer  
 winter

**springs (elastic)**  
 RT ∞ coils  
 energy storage  
 frames  
 oscillation dampers  
 oscillations  
 resilience  
 shock absorbers  
 suspension systems (vehicles)  
 vibration isolators

**springs (water)**  
 DEF Places where ground water flows naturally from rocks onto the land surface or into a body of surface water. Their occurrence depends on the nature and relationship of rocks, especially permeable and impermeable strata, on the position of the water table, and on the topography.

GS resources  
 . Earth resources  
 . . **springs (water)**  
 water  
 . **springs (water)**  
 RT aquifers  
 fresh water  
 ground water  
 inland waters  
 lakes  
 oases  
 potable water  
 water tables  
 wells

**sprinkling**  
 RT scattering  
 spraying  
 wetting

**Sprint missile**  
 GS missiles  
 . antimissile missiles  
 . . **Sprint missile**  
 . surface to air missiles  
 . . **Sprint missile**  
 RT Nike-Zeus missile  
 Sentinel system  
 solid propellant rocket engines  
 Spartan missile

*SPRITE detectors*  
 (added January 2000)  
 USE **infrared detectors**

**sprites (atmospheric physics)**  
 (added January 2000)  
 DEF Short-lived luminosities observed at high altitudes above thunderstorms, apparently associated with upward discharges of thunderstorm electricity. They appear as columnar diffuse reddish glows between 30 km and 80 km above ground, lasting tens of milliseconds, following large positive cloud-to-ground lightning strokes.

UF *red sprites*  
 GS atmospheric radiation  
 . sky radiation  
 . . **sprites (atmospheric physics)**  
 electromagnetic radiation  
 . light (visible radiation)  
 . . sky radiation  
 . . . **sprites (atmospheric physics)**  
 RT atmospheric electricity  
 atmospheric ionization  
 cloud-to-ground discharges  
 elves  
 lightning

## Sputnik 1 satellite

thunderstorms

*SPUR (reactors)*

USE **space power unit reactors**

*SPURT (trajectories)*

USE **spinning unguided rocket trajectory**

### Sputnik 1 satellite

GS artificial satellites  
. meteorological satellites  
. . . **Sputnik 1 satellite**  
. Soviet satellites  
. . . Sputnik satellites  
. . . . **Sputnik 1 satellite**  
Soviet spacecraft  
. Sputnik satellites  
. . . **Sputnik 1 satellite**

### Sputnik 2 satellite

GS artificial satellites  
. biosatellites  
. . . **Sputnik 2 satellite**  
. meteorological satellites  
. . . **Sputnik 2 satellite**  
. Soviet satellites  
. . . Sputnik satellites  
. . . . **Sputnik 2 satellite**  
Soviet spacecraft  
. Sputnik satellites  
. . . **Sputnik 2 satellite**

### Sputnik 3 satellite

GS artificial satellites  
. geophysical satellites  
. . . **Sputnik 3 satellite**  
. meteorological satellites  
. . . **Sputnik 3 satellite**  
. Soviet satellites  
. . . Sputnik satellites  
. . . . **Sputnik 3 satellite**  
Soviet spacecraft  
. Sputnik satellites  
. . . **Sputnik 3 satellite**

### Sputnik 4 satellite

GS artificial satellites  
. Soviet satellites  
. . . Sputnik satellites  
. . . . **Sputnik 4 satellite**  
Soviet spacecraft  
. Sputnik satellites  
. . . **Sputnik 4 satellite**

### Sputnik 5 satellite

GS artificial satellites  
. Soviet satellites  
. . . Sputnik satellites  
. . . . **Sputnik 5 satellite**  
Soviet spacecraft  
. Sputnik satellites  
. . . **Sputnik 5 satellite**  
RT Venus probes

### Sputnik satellites

GS artificial satellites  
. Soviet satellites  
. . . **Sputnik satellites**  
. . . . Sputnik 1 satellite  
. . . . Sputnik 2 satellite  
. . . . Sputnik 3 satellite  
. . . . Sputnik 4 satellite  
. . . . Sputnik 5 satellite  
Soviet spacecraft  
. **Sputnik satellites**  
. . . Sputnik 1 satellite  
. . . Sputnik 2 satellite  
. . . Sputnik 3 satellite  
. . . Sputnik 4 satellite  
. . . Sputnik 5 satellite

### sputtering

DEF Dislocation of surface atoms of a material from bombardment of high energy atomic particles.

GS **sputtering**

. magnetron sputtering

RT arc welding

∞ bombardment

deposition  
duoplasmatrons  
electron bombardment  
emission  
ion plating  
ion sources  
metal particles  
plasma etching  
surface finishing  
thermal instability

### sputtering gages

GS measuring instruments  
. **sputtering gages**  
RT metal films  
thin films

### squalls

GS wind (meteorology)  
. **squalls**  
RT ground wind  
storms (meteorology)

### squama

DEF A scale or structure resembling a scale.  
RT fishes

### square waves

DEF Oscillations, the amplitudes of which show periodic discontinuities between two values, remaining constant between jumps. Specifically, in radar pulses initiated by a rapid rise to peak power, maintained at a constant peak power over the finite pulse length, and terminated by rapid decrease from peak power.

GS waveforms

. **square waves**

RT form factors  
pulse amplitude  
pulse duration  
sawtooth waveforms  
time functions  
wave functions  
wave propagation  
∞ waves

### square wells

DEF The impurity potential areas which bound an electron or hole in semiconducting crystals such as silicon.  
RT electron mobility  
magnetic fields  
photoconductivity  
vacancies (crystal defects)  
wells

### squares (mathematics)

GS geometry  
. Euclidean geometry  
. . . polygons  
. . . . tetragons  
. . . . **squares (mathematics)**

### squeeze casting

(added September 1993)

DEF The technique of working liquid metals under pressure into near net shapes; it includes the technique of forging metal compounds.

GS forming techniques

. casting  
. . **squeeze casting**

RT cast alloys  
compressing  
extruding  
fabrication  
forging  
liquid metals  
metal matrix composites  
metal working

### squeeze films

DEF Thin viscoelastic fluid films squeezed between two usually planar structures to serve as sealants, load dampers, lubricants, etc.

GS fluid films

. **squeeze films**

RT boundary lubrication  
elastohydrodynamics  
∞ films

gas bearings  
gas lubricants  
liquid-solid interfaces  
lubricants  
thin films  
vapor phase lubrication  
viscoelasticity  
viscous fluids

### squeezed states (quantum theory)

DEF Single mode minimum uncertainty states for which the fluctuations in one quadrature phase of the field are smaller than would occur for a coherent state. Used for two photon coherent states.

UF *two photon coherent states*

RT coherent electromagnetic radiation

coherent light

electromagnetic fields

fluctuation theory

light transmission

∞ optics

photon density

quantum mechanics

quantum theory

*squeezing*

USE **compressing**

### snelch circuits

GS circuits

. **snelch circuits**

RT background noise

electromagnetic noise

noise reduction

silencers

suppressors

switching circuits

### squibs

DEF Various small explosive devices. Explosive devices used in the ignition of a rocket. Used for XM-6 squib and XM-8 squib.

UF *XM-6 squib*

*XM-8 squib*

GS igniters

. **squibs**

RT electric ignition

ignition systems

primers (explosives)

solid propellant ignition

starters

### squid (detectors)

DEF Superconducting quantum interference device magnetometers. Used for superconducting quantum interferometers.

UF *superconducting quantum interferometers*

GS superconducting devices

. **squid (detectors)**

RT ∞ detectors

Josephson junctions

magnetic measurement

quantum counters

SIS (superconductors)

superconductors (materials)

### SQUID project

GS programs

. projects

. . . **SQUID project**

RT jet propulsion

### squirrels

GS animals

. vertebrates

. . mammals

. . . rodents

. . . . **squirrels**

. . . . . ground squirrels

*SR (reactors)*

USE **saturable reactors**

### SR-71 aircraft

(added March 1990)

UF *Blackbird aircraft*

GS Lockheed aircraft

. **SR-71 aircraft**

reconnaissance aircraft  
 . **SR-71 aircraft**  
 supersonic aircraft  
 . **SR-71 aircraft**  
 RT ∞ aircraft  
 blended-wing-body configurations  
 ∞ military aircraft

*SRB (Solid Rocket Boosters)*  
 USE **Space Shuttle Boosters**

*SRB project*  
 (added October 2007)  
 USE **Surface Radiation Budget project**

*SRE reactor*  
 USE **sodium reactor experiment**

**SRET 1 satellite**  
 GS artificial satellites  
 . French satellites  
 . . SRET satellites  
 . . . **SRET 1 satellite**  
 . meteorological satellites  
 . . SRET satellites  
 . . . **SRET 1 satellite**  
 RT French space program

**SRET 2 satellite**  
 GS artificial satellites  
 . French satellites  
 . . SRET satellites  
 . . . **SRET 2 satellite**  
 . meteorological satellites  
 . . SRET satellites  
 . . . **SRET 2 satellite**

**SRET satellites**  
 GS artificial satellites  
 . French satellites  
 . . **SRET satellites**  
 . . . SRET 1 satellite  
 . . . SRET 2 satellite  
 . meteorological satellites  
 . . **SRET satellites**  
 . . . SRET 1 satellite  
 . . . SRET 2 satellite  
 RT French space program

**Sri Lanka**  
 UF *Ceylon*  
 GS nations  
 . **Sri Lanka**  
 RT Asia

*SR-N2 ground effect machine*  
 USE **Westland ground effect machines**

*SR-N3 ground effect machine*  
 USE **Westland ground effect machines**

*SR-N5 ground effect machine*  
 USE **Westland ground effect machines**

**SS-11 missile**  
 GS missiles  
 . **SS-11 missile**  
 RT multistage rocket vehicles  
 solid propellant rocket engines

*SSE project*  
 (added October 2007)  
 USE **Surface Meteorology and Solar Energy project**

*SSGS (standardized space guidance)*  
 USE **standardized space guidance**

*SSTI*  
 USE **small satellite technology**

**SSUS-A**  
 USE **Space Shuttle upper stage A**

**SSUS-D**  
 USE **Space Shuttle upper stage D**

**St Lawrence Valley (North America)**  
 GS landforms  
 . **St Lawrence Valley (North America)**

valleys  
 . **St Lawrence Valley (North America)**

RT Canada  
 Maine  
 New Hampshire  
 New York  
 Vermont

**St Louis-Kansas City Corridor (MO)**  
 GS corridors  
 . **St Louis-Kansas City Corridor (MO)**  
 RT Missouri  
 regional planning

*St Venant flexure problem*  
 USE **Saint Venant principle**

**stability**  
 DEF The property of a body, as an aircraft or rocket, to maintain its attitude or to resist displacement, and, if displaced to develop forces and moments tending to restore the original condition. Of a fuel, the capability of a fuel to retain its characteristics in an adverse environment, e.g. extreme temperature. Used for instability.

UF *instability*  
 GS **stability**  
 . acoustic instability  
 . baroclinic instability  
 . dynamic stability  
 . . combustion stability  
 . . . flame stability  
 . . control stability  
 . . frequency stability  
 . . motion stability  
 . . . aerodynamic stability  
 . . . aircraft stability  
 . . . . hovering stability  
 . . . attitude stability  
 . . . . directional stability  
 . . . . . gyroscopic stability  
 . . . . lateral stability  
 . . . . longitudinal stability  
 . . flow stability  
 . . . boundary layer stability  
 . . . flame stability  
 . . . magnetohydrodynamic stability  
 . . . . Weibel instability  
 . . . . Goertler instability  
 . . . . Taylor instability  
 . . low speed stability  
 . . rotary stability  
 . . . gyroscopic stability  
 . . spacecraft stability  
 . . gravitational instability  
 . interface stability  
 . laser stability  
 . magnetospheric instability  
 . numerical stability  
 . phase stability (materials)  
 . static stability  
 . . dimensional stability  
 . . . structural stability  
 . . . . shell stability  
 . storage stability  
 . surface stability  
 . systems stability  
 . thermal stability  
 RT amplification  
 ballast (mass)  
 chemical compatibility  
 compatibility  
 controllability  
 ∞ drift  
 drift rate  
 durability  
 dynamic characteristics  
 equations of motion  
 ∞ equilibrium  
 metastable state  
 quality  
 reliability  
 ∞ resistance  
 safety factors  
 spacecraft motion  
 stabilizers (agents)  
 steady state

tolerances (mechanics)  
 Tresca flow  
 unity  
 unsteady state  
 variability  
 vlasov equations  
 vulnerability

**stability augmentation**  
 DEF Maintenance of aircraft stability in flight by means of automatic control devices which supplement a pilot's manipulation of the aircraft controls. The automatic controls are used to modify inherent aircraft handling problems.  
 GS augmentation  
 . **stability augmentation**  
 RT aerodynamic stability  
 aircraft control  
 attitude (inclination)  
 automatic control  
 control stability  
 directional stability  
 feedback control  
 flight control  
 lateral oscillation  
 pitch (inclination)

**stability derivatives**  
 UF *aerodynamic moments*  
 GS moments  
 . **stability derivatives**  
 . . pitching moments  
 . . rolling moments  
 . . yawing moments  
 RT complex variables  
 damping  
 differential equations  
 moments of inertia  
 real variables  
 vector analysis

**stability tests**  
 GS **stability tests**  
 . flight stability tests  
 . wind tunnel stability tests  
 RT corrosion tests  
 damping tests  
 electronic equipment tests  
 flight tests  
 fuel tests  
 ground tests  
 missile tests  
 propellant tests  
 resonance testing  
 ∞ tests  
 vibration tests

**stabilization**  
 UF *missile stabilization*  
 GS **stabilization**  
 . signal stabilization  
 . spin stabilization  
 . three axis stabilization  
 RT acid base equilibrium  
 balancing  
 consolidation  
 ∞ control  
 ∞ equilibrium  
 heat treatment  
 horizontal orientation  
 laser gyroscopes  
 phase stability (materials)  
 stabilizers (agents)  
 stress relieving  
 vertical orientation

**stabilized platforms**  
 RT gimbals  
 gyroscopic stability  
 gyrostabilizers  
 inertial guidance  
 ∞ platforms  
 three axis stabilization

∞ **stabilizers**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT gyroscopes  
 sea keeping  
 stabilizers (agents)

## stabilizers (agents)

stabilizers (fluid dynamics)

### stabilizers (agents)

RT additives  
∞ agents  
anticoagulants  
antioxidants  
neutralizers  
preservatives  
retardants  
stability  
stabilization  
∞ stabilizers

### stabilizers (fluid dynamics)

UF *horizontal stabilizers*  
*vertical stabilizers*  
*vertical tails*  
GS **stabilizers (fluid dynamics)**  
. horizontal tail surfaces  
RT aerial rudders  
airfoils  
control surfaces  
∞ dynamics  
elevators (control surfaces)  
fins  
keels  
rudders  
∞ stabilizers  
sweptback tail surfaces  
T tail surfaces  
tabs (control surfaces)  
tail assemblies  
tail surfaces  
trapezoidal tail surfaces

### stable oscillations

GS oscillations  
. **stable oscillations**  
RT dynamic stability  
frequency pulling  
frequency stability  
gyroscopic stability  
motion stability  
nonstabilized oscillation  
pilot induced oscillation  
resonant vibration  
transverse oscillation  
undamped oscillations  
wing oscillations

### stacking fault energy

RT crystal defects  
∞ energy  
twinning

### stacking faults

USE **crystal defects**

### stacking sequence (composite materials)

(added June 1997)  
RT composite materials  
fiber composites  
fiber orientation  
laminates  
lay-up  
ply orientation

### stacks

RT chimneys  
crystal defects  
materials handling

### STADAN (satellite tracking network)

USE **STDN (network)**

### stadimeters

DEF Instruments for determining the distance to an object of known dimension by measuring the angle subtended at the observer by the object. The instrument is graduated directly in distance.

GS measuring instruments  
. distance measuring equipment  
. . . **stadimeters**  
RT range finders  
sextants

### stage separation

UF *staging (rockets)*

RT booster rocket engines  
expendable stages (spacecraft)  
interim stages (spacecraft)  
Lunar Module Ascent Stage  
missiles  
∞ **stalling**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aerodynamic stalling  
boundary layer separation  
engine failure  
rotating stalls

### staggering

RT ∞ configurations  
disorientation

### staging (rockets)

USE **stage separation**

### stagnation flow

GS fluid flow  
. inviscid flow  
. . . **stagnation flow**  
RT boundary layer flow  
boundary layer separation  
compressible flow  
stagnation point

### stagnation point

DEF Point in a field of flow about a body where the fluid particles have zero velocity with respect to the body. Used for stagnation region.

UF *stagnation region*  
RT blunt bodies  
boundary layer flow  
flow distribution  
fluid dynamics  
heat transfer  
stagnation flow

### stagnation pressure

GS pressure  
. **stagnation pressure**  
RT compressible flow  
inlet pressure

### stagnation region

USE **stagnation point**

### stagnation temperature

GS temperature  
. **stagnation temperature**  
RT adiabatic flow  
compressible flow  
inviscid flow

### staining

RT chemical tests  
discoloration  
marking  
methylene blue  
methylene blue

### stainless steels

GS alloys  
. iron alloys  
. . steels  
. . . **stainless steels**  
. . . . austenitic stainless steels  
. . . . ferritic stainless steels  
. . . . martensitic stainless steels  
RT chromium alloys  
maraging steels  
molybdenum alloys  
nickel alloys  
nickel steels

### staircases

USE **stairways**

### stairsteps

RT backward facing steps  
formations  
∞ steps  
topography

### stairways

UF *staircases*  
RT buildings

escalators  
ladders  
treads

### ∞ stalling

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT aerodynamic stalling  
boundary layer separation  
engine failure  
rotating stalls

### stamping

SN (EXCLUDES IDENTIFICATION MARKING)  
GS forming techniques  
. pressing (forming)  
. . **stamping**  
RT ∞ blanking  
blanking (cutting)  
coining  
cold working  
dies  
dimpling  
forging  
hot isostatic pressing  
hot pressing  
metal working  
punches  
shearing  
swaging  
upsetting

### standard atmospheres

USE **reference atmospheres**

### standard deviation

DEF A measure of the agreement between test results.  
GS moments  
. distribution moments  
. . **standard deviation**  
statistical analysis  
. **standard deviation**  
RT confidence limits  
estimating  
heterogeneity  
quality control  
range (extremes)  
variability  
variance (statistics)

### standard electroweak model

USE **electroweak model**

### standard launch vehicle 3

USE **Atlas SLV-3 launch vehicle**

### Standard Launch Vehicle 5

GS launch vehicles  
. Standard Launch Vehicles  
. . **Standard Launch Vehicle 5**  
rocket vehicles  
. Standard Launch Vehicles  
. . **Standard Launch Vehicle 5**

### Standard Launch Vehicles

UF *SLV*  
GS launch vehicles  
. **Standard Launch Vehicles**  
. . Atlas SLV-3 launch vehicle  
. . Standard Launch Vehicle 5  
rocket vehicles  
. **Standard Launch Vehicles**  
. . Atlas SLV-3 launch vehicle  
. . Standard Launch Vehicle 5  
RT Atlas D ICBM  
∞ vehicles

### standard model (particle physics)

(added April 1994)  
GS field theory (physics)  
. gauge theory  
. . unified field theory  
. . . **standard model (particle physics)**  
models  
. **standard model (particle physics)**  
RT bosons  
CP violation  
electroweak interactions (field theory)

electroweak model  
 elementary particles  
 particle theory  
 quantum chromodynamics  
 quantum theory  
 quark models  
 strong interactions (field theory)  
 weak interactions (field theory)

**standardization**

DEF The act or process of reducing something to, or comparing it with, a standard. A measure of uniformity. A special case of calibration whereby a known input is applied to a device or system for the purpose of verifying the output of adjusting the output to a desired level or scale factor.

GS **standardization**

. commonality  
 RT calibrating  
 intercalibration  
 metrication  
 naming  
 numerical control  
 product development  
 production engineering  
 quality control  
 specifications  
 standards  
 variability

**standardized space guidance**

UF *SSGS (standardized space guidance)*

GS guidance (motion)  
 . **standardized space guidance**  
 RT space navigation

**standards**

DEF References used as a basis for comparison or calibration. Concepts that have been established by authority, custom, or agreement to serve as models or rules in the measurement of quantity of the establishment of a practice or a procedure. Used for references (standards).

UF *references (standards)*

GS **standards**  
 . frequency standards  
 . reference atmospheres

RT acceptability  
 accuracy  
 calibrating  
 ∞ codes  
 conventions  
 criteria  
 document markup languages  
 inspection  
 interoperability  
 ∞ measurement  
 ∞ measures  
 metrology  
 ∞ performance  
 performance tests  
 quality control  
 reliability  
 sampling  
 specifications  
 standardization  
 temperature scales  
 tolerances (mechanics)  
 validity  
 value engineering

**standing wave ratios**

GS ratios  
 . **standing wave ratios**  
 RT amplitudes  
 electrical properties  
 Smith chart  
 transmission lines

**standing waves**

DEF Periodic waves having fixed distribution in space which are the result of interference of progressive waves of the same frequency and kind. Such waves are characterized by the existence of nodes or partial nodes and antinodes that are fixed in space.

RT antinodes  
 beat frequencies  
 frequencies

harmonics  
 nodes (standing waves)  
 ∞ radiation  
 resonant frequencies  
 vibration  
 wavelengths  
 ∞ waves

*stands*

USE **supports**

**stannates**

GS tin compounds  
 . **stannates**  
 RT ∞ oxygen compounds

**stannides**

GS tin compounds  
 . **stannides**  
 . . niobium stannides  
 RT tin alloys

**Stanton number**

GS dimensionless numbers  
 . **Stanton number**  
 ratios  
 . **Stanton number**  
 RT forced convection  
 heat transfer

*STAP (radar)*

(added November 2002)

USE **space-time adaptive processing**

**staphylococcus**

GS microorganisms  
 . bacteria  
 . . **staphylococcus**  
 RT pleurotin

*star catalogs*

USE **astronomical catalogs**

**star clusters**

DEF Groups of stars physically close together.

GS celestial bodies  
 . **star clusters**  
 . . globular clusters  
 . . open clusters  
 . . . Pleiades cluster  
 . . . Praesepe star clusters  
 RT barred galaxies  
 binary stars  
 ∞ clusters  
 color-magnitude diagram  
 disk galaxies  
 elliptical galaxies  
 galactic clusters  
 galaxies  
 irregular galaxies  
 Magellanic clouds  
 metallicity  
 solar neighborhood  
 stars  
 stellar systems  
 Virgo galactic cluster

**star distribution**

UF *star fields*  
*stellar fields*  
 GS distribution (property)  
 . spatial distribution  
 . . vertical distribution  
 . . . **star distribution**  
 RT angular distribution  
 astrolabes  
 barred galaxies  
 cosmology  
 galactic clusters  
 galactic evolution  
 galactic halos  
 globular clusters  
 mass distribution  
 radial distribution  
 star formation  
 stellar systems

Virgo galactic cluster

*star fields*

USE **star distribution**

**star formation**

DEF The collapse under gravity of molecular clouds of interstellar matter to form clusters of protostars, and the continuing collapse of the protostars to form main-sequence stars.

GS evolution (development)

. stellar evolution  
 . . **star formation**

RT astrophysics  
 cooling flows (astrophysics)  
 cosmology  
 early stars  
 hydrogen clouds  
 interstellar gas  
 interstellar matter  
 molecular clouds  
 nebulae  
 nuclear fusion  
 pre-main sequence stars  
 protogalaxies  
 protostars  
 solar nebula  
 star distribution  
 star formation rate  
 starburst galaxies  
 stars  
 stellar mass accretion  
 Submillimeter Wave Astronomy  
 Satellite  
 T Tauri stars

**star formation rate**

DEF The rate at which stars are formed within a specified region or galaxy; sometimes expressed as the number of solar masses per year.

GS rates (per time)  
 . **star formation rate**

RT galactic evolution  
 galaxies  
 star formation  
 starburst galaxies  
 stellar evolution

**star trackers**

DEF Telescopic instruments on rockets or other flight borne vehicles that lock onto a celestial body and give guidance reference to the vehicles during flight. Used for star tracking.

UF *star tracking*

GS tracking (position)

. **star trackers**  
 . . CCD star tracker

RT Astroguide Navigation System  
 astrolabes  
 attitude control  
 celestial navigation  
 charge injection devices  
 flight instruments  
 guidance sensors  
 inertial navigation  
 laser guide stars  
 missile control  
 navigation  
 navigation aids  
 navigation instruments  
 solar sensors  
 spacecraft guidance

*star tracking*

USE **star trackers**

**starburst galaxies**

GS celestial bodies  
 . galaxies  
 . . **starburst galaxies**  
 RT galactic nuclei  
 star formation  
 star formation rate

**starches**

GS biopolymers  
 . polysaccharides  
 . . **starches**  
 organic compounds

## Stardust Mission

- . carbohydrates
- . . polysaccharides
- . . . **starches**
- RT chitin
- ∞ food
- sizing materials

### Stardust Mission

(added March 1999)

DEF First U.S. mission launched to robotically obtain samples in deep space and return them to Earth. The NASA Discovery-class mission will return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.

- GS space missions
- . flyby missions
- . . **Stardust Mission**
- . sample return missions
- . . **Stardust Mission**
- RT comet nuclei
- interstellar matter
- Wild 2 comet

Starfighter aircraft

USE **F-104 aircraft**

### Stark effect

DEF The broadening or splitting of a spectral line observed when a luminous gas is acted upon by a strong electric field.

- RT ∞ effects
- electric fields
- electro-optics
- hydrogen plasma
- line spectra
- resolution
- spectrum analysis
- Zeeman effect

### Starlab

DEF A proposed satellite ultraviolet telescope that was a joint project between the United States, Canada, and Australia. It is currently in abeyance. Used for Spacelab UV-Optical Telescope Facility.

- UF *Spacelab UV-Optical Telescope Facility*
- GS telescopes
- . spaceborne telescopes
- . . **Starlab**
- . ultraviolet telescopes
- . . **Starlab**
- RT ∞ optics
- Space Shuttle payloads
- Spacelab

Starlifter aircraft

USE **C-141 aircraft**

### Starprobe mission

- GS programs
- . NASA programs
- . . NASA space programs
- . . . **Starprobe mission**
- . space programs
- . . NASA space programs
- . . . **Starprobe mission**
- space missions
- . **Starprobe mission**
- RT Starprobe spacecraft

### Starprobe spacecraft

- GS unmanned spacecraft
- . space probes
- . . solar probes
- . . . **Starprobe spacecraft**
- RT Starprobe mission

### starquakes

(added July 1989)

- RT asteroseismology
- gamma ray bursts
- neutron stars
- pulsars
- stars

- stellar activity
- stellar physics
- stellar rotation
- stellar structure

### stars

DEF Self-luminous celestial bodies exclusive of nebulas, comets, and meteors; suns seen in the heavens. Distinguished from planets or natural satellites that shine by reflected light.

- GS celestial bodies
- . **stars**
- . . black holes (astronomy)
- . . brown dwarf stars
- . . double stars
- . . . binary stars
- . . . . cataclysmic variables
- . . . . companion stars
- . . . . . Nemesis (star)
- . . . . . eclipsing binary stars
- . . . . . dwarf novae
- . . . . . Lambda Tauri stars
- . . . . . Zeta Aurigae star
- . . . . Sigma Orionis
- . . . . symbiotic stars
- . . . . x ray binaries
- . . early stars
- . . hot stars
- . . . . A stars
- . . . . B stars
- . . . . . shell stars
- . . . . . Sigma Orionis
- . . . . blue stars
- . . . . O stars
- . . . . white dwarf stars
- . . . . Wolf-Rayet stars
- . . F stars
- . . G stars
- . . sun
- . . giant stars
- . . . asymptotic giant branch stars
- . . . Omicron Ceti star
- . . . red giant stars
- . . . carbon stars
- . . horizontal branch stars
- . . infrared stars
- . . late stars
- . . cool stars
- . . . carbon stars
- . . . flare stars
- . . . . K stars
- . . . . M stars
- . . . . . Van Biesbroeck star
- . . . . Mira variables
- . . . . . Omicron Ceti star
- . . . . S stars
- . . magnetic stars
- . . magnetars
- . . main sequence stars
- . . dwarf stars
- . . . dwarf novae
- . . . flare stars
- . . . red dwarf stars
- . . sun
- . . massive stars
- . . metallic stars
- . . neutron stars
- . . magnetars
- . . pulsars
- . . soft gamma repeaters
- . . peculiar stars
- . . shell stars
- . . . Sigma Orionis
- . . . symbiotic stars
- . . Praesepe star clusters
- . . protostars
- . . pre-main sequence stars
- . . . T Tauri stars
- . . radio stars
- . . pulsars
- . . reference stars
- . . subdwarf stars
- . . subgiant stars
- . . supergiant stars
- . . . R Coronae Borealis stars
- . . supermassive stars
- . . triple stars
- . . variable stars
- . . . cataclysmic variables

- . . . cepheid variables
- . . . flare stars
- . . . irregular variable stars
- . . . . R Coronae Borealis stars
- . . . Lambda Tauri stars
- . . . Mira variables
- . . . . Omicron Ceti star
- . . . novae
- . . . . dwarf novae
- . . . . Hercules nova
- . . . semiregular variable stars
- . . . supernovae
- . . . . supernova 1987A
- . . . symbiotic stars
- . . . T Tauri stars
- . . white holes (astronomy)
- . . x ray stars
- . . soft gamma repeaters
- . . . x ray binaries
- . . Population I stars
- . . Population II stars
- . . Population III stars
- RT Aries constellation
- astrolabes
- barred galaxies
- Cassiopeia constellation
- celestial mechanics
- Centaurus constellation
- constellations
- Corona Borealis constellation
- Cygnus constellation
- faint objects
- galaxies
- irregular galaxies
- Lyra constellation
- Magellanic clouds
- metallicity
- Milky Way Galaxy
- quasars
- solar neighborhood
- star clusters
- star formation
- starquakes
- starspots
- stellar activity
- stellar composition
- stellar cores
- stellar gravitation
- stellar interiors
- stellar magnitude
- stellar oscillations
- Virgo galactic cluster

### stars (mathematics)

RT ∞ mathematics

### Starsat telescope

DEF An anastigmatic 3-mirror reflecting telescope for ultraviolet astronomy purposes aboard the Starsat satellite.

- GS telescopes
- . reflecting telescopes
- . . **Starsat telescope**
- . spaceborne telescopes
- . . **Starsat telescope**

- RT coronagraphs
- spaceborne astronomy
- spectroheliographs
- ultraviolet astronomy

### Starsite program

- GS programs
- . **Starsite program**
- RT architecture
- buildings
- communities
- conferences
- construction
- decision making
- ∞ development
- environmental engineering
- information retrieval
- land use
- management methods
- NASA programs
- planning
- recreation
- shelters
- social factors
- technology transfer

- urban development
- urban planning
- starspots**
  - DEF Temporary disturbed areas in the stellar photosphere that appear dark because they are colder than the surrounding areas.
  - GS stellar activity
    - . **starspots**
    - . . sunspots
  - RT faculae
    - magnetic disturbances
    - photosphere
    - solar activity
    - stars
    - stellar atmospheres
    - stellar luminosity
    - stellar magnetic fields
    - stellar radiation
    - sunspot cycle
    - twenty-seven day variation
- starters**
  - GS **starters**
    - . engine starters
  - RT actuators
    - ignition systems
    - squibs
    - starting
- starting**
  - GS **starting**
    - . air start
  - RT activation
    - actuation
    - cycles
    - electric ignition
    - engine primers
    - excitation
    - firing (igniting)
    - ignition
    - initiation
    - launching
    - ∞ priming
    - reactor startup tests
    - starters
    - stimulation
- state equations*
  - USE **equations of state**
- state estimation**
  - RT algorithms
    - Kalman filters
    - linear systems
    - orbital position estimation
    - state vectors
    - stochastic processes
- state vectors**
  - GS algebra
    - . vector spaces
    - . . vectors (mathematics)
    - . . . **state vectors**
  - RT observability (systems)
    - phase-space integral
    - state estimation
    - steady state
    - strange attractors
- static aerodynamic characteristics**
  - GS aerodynamic characteristics
    - . **static aerodynamic characteristics**
    - static characteristics
    - . **static aerodynamic characteristics**
  - RT aerodynamic balance
    - aerodynamic stability
    - ∞ characteristics
- static alternators**
  - GS electric generators
    - . AC generators
    - . . **static alternators**
- static characteristics**
  - SN (EXCLUDES STATICS)
  - GS **static characteristics**
    - . static aerodynamic characteristics
  - RT static loads
    - static stability
- static tests
  - static deformation
    - GS deformation
      - . **static deformation**
    - RT creep properties
      - Maxwell-Mohr method
      - Saint Venant principle
  - static dischargers
    - UF *antistatic devices*
    - GS dischargers
      - . **static dischargers**
  - static electricity
    - GS electricity
      - . **static electricity**
    - RT atmospheric electricity
      - atmospherics
      - electric corona
      - electric fields
      - electric potential
      - electric sparks
      - electrostatic charge
      - electrostatics
      - lightning
      - open circuit voltage
      - space charge
  - static firing
    - DEF The firing of a rocket engine in a hold down position to measure thrust and accomplish other tests.
    - GS captive tests
      - . static tests
      - . . **static firing**
      - engine tests
        - . **static firing**
      - firing (igniting)
        - . test firing
        - . . **static firing**
      - ground tests
        - . prelaunch tests
        - . . **static firing**
    - RT rocket firing
  - static friction
    - GS friction
      - . **static friction**
    - RT coefficient of friction
      - dry friction
      - friction measurement
      - kinetic friction
      - sliding
      - sliding friction
  - static inverters
    - GS inverters
      - . **static inverters**
    - RT electric generators
  - static loads
    - UF *deadweight*
    - GS loads (forces)
      - . **static loads**
    - RT aerodynamic loads
      - axial compression loads
      - axial loads
      - ballast (mass)
      - bending moments
      - compression loads
      - critical loading
      - dynamic loads
      - edge loading
      - flexural strength
      - loading moments
      - mass distribution
      - moment distribution
      - pressure distribution
      - random loads
      - Saint Venant principle
      - static characteristics
      - structural design criteria
      - transverse loads
      - wing loading
  - static models
    - DEF Sets of equations of physical laws to determine a balance of systems at rest.
    - GS models
- . **static models**
  - RT approximation
    - dynamic models
    - optimization
- static pressure**
  - GS pressure
    - . **static pressure**
    - . . hydrostatic pressure
  - RT isostatic pressure
    - pitot tubes
    - sound pressure
- static stability**
  - GS stability
    - . **static stability**
    - . . dimensional stability
    - . . . structural stability
    - . . . . shell stability
  - RT aircraft stability
    - counterbalances
    - drift (instrumentation)
    - dynamic stability
    - magneto-hydrostatics
    - static characteristics
    - storage stability
    - stratification
    - surface stability
- static tests**
  - SN (ENCOMPASSES MATERIALS, ENGINE, AND VEHICLE TESTS)
  - GS captive tests
    - . **static tests**
    - . . static firing
  - RT cold flow tests
    - compression tests
    - creep tests
    - dynamic tests
    - engine tests
    - fatigue tests
    - ground tests
    - hardness tests
    - inspection
    - load tests
    - ∞ materials tests
    - missile tests
    - nondestructive tests
    - prefiring tests
    - prelaunch tests
    - quality control
    - resonance testing
    - static characteristics
    - tensile tests
    - test firing
    - ∞ tests
    - vibration tests
    - wear tests
- static thrust**
  - GS thrust
    - . **static thrust**
  - RT jet thrust
    - rocket thrust
- statics**
  - GS **statics**
    - . aerostatics
    - . electrostatics
    - . hydrostatics
    - . . magneto-hydrostatics
  - RT ∞ dynamics
    - elastostatics
    - ∞ equilibrium
    - fluid mechanics
    - mechanics (physics)
- stationary orbits**
  - DEF Orbits in which the satellite revolves about the primary at the angular rate at which the primary rotates on its axis. From the primary, the satellite thus appears to be stationary over a point on the primary.
  - GS orbits
    - . circular orbits
    - . . **stationary orbits**
    - . equatorial orbits
    - . . **stationary orbits**
    - . spacecraft orbits
    - . . satellite orbits



## stationkeeping

- . . . **stationary orbits**
  - RT Earth orbits
  - geosynchronous orbits
  - synchronous satellites
  - twenty-four hour orbits
- stationkeeping**
- DEF The sequence of maneuvers that maintains a vehicle in predetermined orbit.
  - GS positioning
  - . **stationkeeping**
  - RT formation flying
  - guidance (motion)
  - navigation
  - orbital mechanics
  - orbits
  - payload retrieval (STS)
  - satellite constellations
  - spacecraft control

## stations

- GS **stations**
  - . ground stations
  - . . Deep Space Instrumentation Facility
  - . . Earth terminals
  - . . integrated mission control center
  - . . polystation doppler tracking system
  - . hydroelectric power stations
  - . payload stations
  - . space stations
  - . . Automatic Universal Orbiting Stations
  - . . Columbus space station
  - . . Halo Orbit space station
  - . . International Space Station
  - . . man tended free flyers
  - . . Mir space station
  - . . orbiting lunar stations
  - . . Salyut space station
  - . . Skylab 1
  - . . Skylab 2
  - . . Skylab 3
  - . . Skylab 4
  - . . Space Operations Center (NASA)
  - . . Space Station Freedom
  - . . space station polar platforms
  - . tracking stations
  - . . Deep Space Instrumentation Facility
  - . . Global Tracking Network
  - . . polystation doppler tracking system
  - . weather stations
  - . . automatic weather stations
  - . workstations
  - . . crew workstations
  - . . . crew experiment stations
  - . . . crew observation stations
- RT ∞ bases
- ∞ facilities
  - lunar bases
  - military air facilities
  - planetary bases
  - position (location)
  - space bases
  - Space Flight Tracking and Data Network

## statistical analysis

- GS **statistical analysis**
- . amplitude distribution analysis
- . correlation coefficients
- . discriminant analysis (statistics)
- . factor analysis
- . goodness of fit
- . likelihood ratio
- . Maxwell-Boltzmann density function
- . nonparametric statistics
- . Poisson density functions
- . probability density functions
- . . normal density functions
- . . Pearson distributions
- . . Rayleigh distribution
- . . Weibull density functions
- . probability distribution functions
- . quantiles
- . sequential analysis
- . standard deviation
- . statistical correlation
- . statistical decision theory

- . statistical tests
  - . . Kolmogorov-Smirnov test
  - . . Mann-Whitney-Wilcoxon U test
  - . . rank tests
  - . variance (statistics)
  - . . analysis of variance
  - . . multivariate statistical analysis
  - . . . bivariate analysis
  - . . . covariance
  - . . . orthogonality
  - . . . regression analysis
  - . . . . regression coefficients
- RT ∞ analyzing
- ∞ applications of mathematics
  - approximation
  - autoregressive processes
  - binomial theorem
  - biometrics
  - censored data (mathematics)
  - charts
  - Chebyshev approximation
  - cluster analysis
  - coefficients
  - confidence
  - confidence limits
  - continuity (mathematics)
  - correlation
- ∞ data
- data correlation
  - decision theory
  - discrete functions
- ∞ dispersion
- economics
  - estimates
  - estimating
  - events
  - expectancy hypothesis
  - experiment design
  - exponential functions
  - extrapolation
  - factorial design
  - failure analysis
  - forecasting
  - game theory
  - Gauss-Markov theorem
  - graphs (charts)
  - information theory
  - inspection
  - interpolation
  - linear prediction
  - management
- ∞ mathematics
- maximum entropy method
  - mean
  - median (statistics)
  - Mills ratio
  - minimum variance orbit determination
  - Monte Carlo method
  - MTBF
  - operations research
  - outliers (statistics)
  - parameter identification
  - probability theory
  - quality control
  - quartiles
  - queueing theory
  - random processes
  - reliability
  - root-mean-square errors
  - sampling
- ∞ statistics
- stochastic processes
  - system identification
  - systems analysis
  - systems engineering
  - tables (data)
  - Taguchi methods
  - teleconnections (meteorology)
  - traveling salesman problem
  - trend analysis
  - Wiener filtering
  - Yang-Mills theory

*statistical communication theory*  
USE **communication theory**

## statistical correlation

- GS correlation
- . **statistical correlation**

- statistical analysis
- . **statistical correlation**
- RT correlation coefficients
- data correlation
- econometrics
- evaluation
- quality control
- ∞ statistics
- teleconnections (meteorology)

## statistical decision theory

- GS decision theory
- . **statistical decision theory**
- statistical analysis
- . **statistical decision theory**
- RT game theory
- ∞ theories

## statistical distributions

- UF *random distributions*
- GS **statistical distributions**
- . brightness distribution
- . Pearson distributions
- . probability distribution functions
- . Rayleigh distribution
- RT binomial theorem
- censored data (mathematics)
- complexity
- curve fitting
- ∞ distribution
- distribution (property)
- distribution functions
- distribution moments
- error functions
- events
- expectancy hypothesis
- forecasting
- gamma function
- goodness of fit
- Kolmogorov-Smirnov test
- kurtosis
- mathematical models
- outliers (statistics)
- probability theory
- quality control
- quantiles
- quantum theory
- quartiles
- reliability
- scattering
- size distribution

## statistical mechanics

- DEF Branch of physics concerned with predictions of the behavior of macroscopic systems based on the interactions of the microscopic constituents of the system, where the number of constituents is very large.
- RT Boltzmann distribution
- Boltzmann transport equation
- classical mechanics
- closure law
- cluster variation method
- continuum mechanics
- energy distribution
- fluctuation theory
- function space
- Ising model
- Liouville equations
- macroscopic equations
- Malkus theory
- many body problem
- Maxwell-Boltzmann density function
- mechanics (physics)
- molecular dynamics
- Onsager phenomenological coefficient
- quantum mechanics
- quantum theory
- renormalization group methods
- thermodynamic equilibrium
- virial theorem
- weighting functions

*statistical moments*  
USE **distribution moments**

*statistical probability*  
USE **probability theory**

## statistical tests

- UF *Bruceton test*

GS statistical analysis  
 . **statistical tests**  
 . . Kolmogorov-Smirnov test  
 . . Mann-Whitney-Wilcoxon U test  
 . . rank tests

RT charts  
 confidence limits  
 curve fitting  
 ∞ data  
 estimates  
 estimating  
 factor analysis  
 goodness of fit  
 heterogeneity  
 homogeneity  
 likelihood ratio  
 normality  
 null hypothesis  
 outliers (statistics)  
 quality control  
 range (extremes)  
 regression analysis  
 reliability  
 significance  
 ∞ tests  
 validity

**statistical weather forecasting**

GS meteorology  
 . weather forecasting  
 . . **statistical weather forecasting**  
 predictions  
 . forecasting  
 . . weather forecasting  
 . . . **statistical weather forecasting**

RT long range weather forecasting  
 numerical weather forecasting

∞ **statistics**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT arrays  
 biometrics  
 census  
 ∞ data  
 demography  
 entropy (statistics)  
 estimates  
 estimating  
 Fermi-Dirac statistics  
 information theory  
 nonparametric statistics  
 populations  
 probability theory  
 quantiles  
 quantum statistics  
 random variables  
 reliability  
 sampling  
 statistical analysis  
 statistical correlation  
 stochastic processes  
 surveys  
 systems engineering  
 tables (data)  
 time series analysis

**stator blades**

GS turbomachine blades  
 . **stator blades**

RT ∞ blades  
 compressor blades  
 rotor blades (turbomachinery)  
 rotor stator interactions  
 stators  
 turbine blades  
 vanes

**stators**

DEF In machinery, parts or assemblies that remain stationary with respect to rotating or moving parts or assemblies such as the field frames of electric motors or generators, or the stationary casings and blades surrounding axial flow compressor rotors or turbine wheels.

RT compressors  
 electric motors  
 ∞ generators  
 impellers

motors  
 pumps  
 ∞ rotating electrical machines  
 rotors  
 stator blades  
 turbines

**statutes**

USE **law (jurisprudence)**

**stays**

USE **guy wires**

**STDN (network)**

DEF Spaceflight Tracking and Data Network. Name changed from Space Tracking and Data Acquisition Network (STDAN). Used for Satellite Tracking and Data Acq Network, Spacecraft Tracking and Data Network, and STADAN (satellite tracking network).

UF *Satellite Tracking and Data Acq Network*  
*Spacecraft Tracking and Data Network*  
*STADAN (satellite tracking network)*

GS networks  
 . tracking networks  
 . . **STDN (network)**

RT data acquisition  
 Global Tracking Network  
 minitrack system  
 optical tracking  
 range and range rate tracking  
 satellite tracking  
 space detection and tracking system  
 Space Flight Tracking and Data Network  
 tracking stations

**steady flow**

GS fluid flow  
 . **steady flow**  
 . . Couette flow  
 . . Hartmann flow  
 . . Ringleb flow

RT Beltrami flow  
 continuity equation  
 critical flow  
 Crocco method  
 equilibrium flow

∞ flow  
 flow characteristics  
 flow geometry  
 flow stability  
 gas flow  
 heat transmission  
 hydrodynamic coefficients  
 laminar flow  
 liquid flow  
 low turbulence  
 mass flow  
 method of characteristics  
 multiphase flow  
 nonNewtonian flow  
 orifice flow  
 parallel flow  
 pipe flow  
 pressure gradients  
 quasi-steady states  
 single-phase flow  
 solids flow  
 steam flow  
 Stokes flow  
 subcritical flow  
 supercritical flow  
 turbulence  
 turbulent flow  
 two dimensional flow  
 uniform flow  
 unsteady flow

**steady state**

DEF The condition of a substance or system whose local physical and chemical properties do not vary with time.

RT ∞ equilibrium  
 fluid dynamics  
 metastable state  
 stability  
 state vectors

unsteady flow  
 unsteady state

**steady state creep**

GS mechanical properties  
 . creep properties  
 . . **steady state creep**

RT plastic flow  
 quasi-steady states

*steady state flow*

USE **equilibrium flow**

*stealth bomber*

USE **B-2 aircraft**

**stealth technology**  
 (added November 2001)

DEF Methods, materials, and designs for reducing the detectability of vehicles and other systems by radar or any other electronic or optical means.

UF *antidetection technology*  
 countermeasures

GS countermeasures  
 . **stealth technology**

RT antiradar coatings  
 B-2 aircraft  
 camouflage  
 electronic countermeasures  
 electronic warfare  
 optical countermeasures  
 radar absorbers  
 radar cross sections  
 radar detection  
 radar signatures  
 spacecraft defense  
 target masking  
 target recognition  
 X-45 aircraft

**steam**

RT boilers  
 fog  
 superheating  
 thermodynamics  
 water  
 water vapor

**steam flow**

GS fluid flow  
 . **steam flow**

RT critical flow  
 gas flow  
 laminar flow  
 mass flow  
 multiphase flow  
 orifice flow  
 pipe flow  
 pipelines  
 pressure gradients  
 single-phase flow  
 steady flow  
 subcritical flow  
 supercritical flow  
 turbulent flow  
 uniform flow  
 unsteady flow

*steam generators*

USE **boilers**

**steam turbines**

GS turbomachinery  
 . turbines  
 . . **steam turbines**

RT axial flow turbines  
 combined cycle power generation  
 gas turbine engines  
 gas turbines  
 turbogenerators  
 two stage turbines

**stearates**

GS esters  
 . **stearates**

RT soaps

**stearothermophilus**

GS microorganisms  
 . bacteria

## steel structures

- . . Bacillus
- . . . **stearotherophilus**

### steatite

USE **talca**

### steel structures

- GS welded structures
- . **steel structures**
- RT composite structures
- construction
- rigid structures
- ∞ structures

### steels

- GS alloys
- . iron alloys
- . . **steels**
- . . . bainitic steel
- . . . carbon steels
- . . . low carbon steels
- . . . chromium steels
- . . . Croloy
- . . . high strength steels
- . . . maraging steels
- . . . nickel steels
- . . . stainless steels
- . . . . austenitic stainless steels
- . . . . ferritic stainless steels
- . . . . martensitic stainless steels
- RT austenite
- bainite
- cementite
- ferrites
- hydrogen embrittlement
- martensite
- mischmetal
- pearlite

### steep gradient aircraft

USE **V/STOL aircraft**

### steepest ascent method

USE **steepest descent method**

### steepest descent method

- UF *steepest ascent method*
- RT calculus of variations
- dynamic programming
- ∞ methodology
- minima
- optimization
- parameter identification
- system identification

### steepness

USE **slopes**

### steerable antennas

DEF Directional antennas whose major lobe can be readily shifted in direction.

- GS antennas
- . directional antennas
- . . **steerable antennas**
- . . . inertialess steerable antennas
- arrays
- . antenna arrays
- . . **steerable antennas**
- . . . inertialess steerable antennas
- RT beam steering
- phased arrays
- radar antennas

### steering

- GS **steering**
- . beam steering
- RT ∞ control
- control rockets
- controllability
- electron optics
- ∞ flight
- focusing
- suspension systems (vehicles)

### steering rockets

USE **control rockets**

### Stefan-Boltzmann law

DEF One of the radiation laws which states that the amount of energy radiated per unit time from a unit surface area of an ideal black body is

proportional to the fourth power of the absolute temperature of the black body.

- GS laws
- . radiation laws
- . . **Stefan-Boltzmann law**
- RT electromagnetic radiation
- emissivity
- flux (rate)
- heat radiators
- Kirchhoff law of radiation
- radiative heat transfer

### steganography

(added April 2002)

DEF The art and science of communicating in a hidden manner, usually involving a message embedded in a carrier medium such as print, images, or computer files.

- RT computer information security
- cryptography
- security

### Stellar (star tracker)

USE **CCD star tracker**

### stellar activity

DEF A general term encompassing stellar phenomena such as stellar flares, starspot activity, magnetic activity, nuclear fusion, etc.

- GS **stellar activity**
- . solar activity
- . . faculae
- . . solar flares
- . . solar prominences
- . . solar storms
- . . spicules
- . . sunspots
- . starspots
- . . sunspots
- . stellar flares
- . . solar flares
- RT flare stars
- ∞ flares
- magnetic disturbances
- magnetohydrodynamics
- photosphere
- starquakes
- stars
- stellar convection
- stellar interiors
- stellar luminosity
- stellar magnetic fields
- stellar mass ejection
- stellar oscillations
- stellar physics
- stellar radiation
- sunspot cycle

### stellar atmospheres

- GS environments
- . extraterrestrial environments
- . . **stellar atmospheres**
- . . . chromosphere
- . . . solar atmosphere
- . . . . solar transition region
- RT ∞ atmospheres
- cool stars
- limb brightening
- limb darkening
- local thermodynamic equilibrium
- metallic stars
- pulsar magnetospheres
- radiative transfer
- satellite atmospheres
- starspots
- stellar convection
- stellar coronas
- stellar interiors
- stellar magnetospheres

### stellar color

DEF The particular wavelengths of optical radiation emitted by a star.

- GS electromagnetic properties
- . optical properties
- . . color
- . . . **stellar color**
- RT color-color diagram
- color-magnitude diagram
- stellar luminosity

stellar magnitude  
stellar spectra  
stellar spectrophotometry

### stellar composition

- GS composition (property)
- . chemical composition
- . . **stellar composition**
- RT abundance
- B stars
- carbon stars
- isotope ratios
- stars
- stellar models
- stellar physics
- stellar structure

### stellar convection

(added June 1992)

- GS convection
- . **stellar convection**
- . . solar convection (astronomy)
- RT Benard cells
- convection currents
- convective flow
- dynamo theory
- fluid flow
- free convection
- Rayleigh-Benard convection
- stellar activity
- stellar atmospheres
- stellar interiors
- stellar magnetic fields
- stellar physics

### stellar cores

DEF The central portion of the interior of stars.

- GS cores
- . **stellar cores**
- stellar interiors
- . **stellar cores**
- RT astrophysics
- degenerate matter
- gravitational collapse
- planetary cores
- solar interior
- stars
- stellar coronas
- stellar structure

### stellar coronas

DEF Ionized regions about stars formed by x rays emitted during stellar flares. First discovery of a stellar corona was made aboard the Dutch ANS satellite (1975) when permanent x ray emission from the star SIRIUS was detected and measured.

- GS coronas
- . **stellar coronas**
- . . solar corona
- . . . coronal holes
- . . . chromospheres
- . . . coronal loops
- RT coronal mass ejection
- ionization
- Orion nebula
- stellar atmospheres
- stellar cores

### stellar Doppler shift

USE **Doppler effect**

### stellar envelopes

- UF *circumstellar matter*
- RT astrophysics
- cool stars
- ∞ envelopes
- interstellar matter
- protoplanetary disks
- R Coronae Borealis stars
- shell stars
- stellar mass accretion
- stellar mass ejection
- stellar structure
- symbiotic stars
- Wolf-Rayet stars

### stellar evolution

- GS evolution (development)
- . **stellar evolution**

. . star formation  
 . . stellar mass accretion  
 RT asteroseismology  
 astrophysics  
 asymptotic giant branch stars  
 brown dwarf stars  
 color-magnitude diagram  
 cosmology  
 degenerate matter  
 galactic evolution  
 gravitational instability  
 Hertzsprung-Russell diagram  
 horizontal branch stars  
 interstellar extinction  
 late stars  
 main sequence stars  
 neutral currents  
 planetary evolution  
 Population III stars  
 pre-main sequence stars  
 protoplanetary disks  
 protoplanets  
 protostars  
 red giant stars  
 solar nebula  
 solar system evolution  
 star formation rate  
 stellar interiors  
 stellar physics  
 subgiant stars

*stellar fields*

USE **star distribution**

**stellar flares**

DEF Ejections of material from stars in eruptions that last from a few minutes to an hour or more.

GS stellar activity  
 . **stellar flares**  
 . . solar flares  
 RT cataclysmic variables  
 flare stars  
 ∞ flares  
 stellar luminosity  
 stellar physics  
 stellar radiation

**stellar gravitation**

GS gravitation  
 . **stellar gravitation**  
 . . solar gravitation  
 RT gravitational binding energy  
 gravitational fields  
 gravitational instability  
 gravitational lenses  
 stars  
 stellar mass  
 stellar systems

**stellar interiors**

DEF The subsurface portions of stars.

GS **stellar interiors**  
 . solar interior  
 . stellar cores  
 RT asteroseismology  
 astrophysics  
 convection  
 gravitational collapse  
 nuclear fusion  
 stars  
 stellar activity  
 stellar atmospheres  
 stellar convection  
 stellar evolution  
 stellar models  
 stellar physics  
 stellar structure

**stellar luminosity**

GS electromagnetic properties  
 . optical properties  
 . . luminosity  
 . . . **stellar luminosity**  
 RT brightness  
 brightness distribution  
 Hertzsprung-Russell diagram  
 horizontal branch stars  
 limb brightening  
 limb darkening

luminescence  
 mass to light ratios  
 red dwarf stars  
 red giant stars  
 starspots  
 stellar activity  
 stellar color  
 stellar flares  
 stellar parallax  
 stellar physics  
 Wolf-Rayet stars

**stellar magnetic fields**

GS magnetic fields  
 . **stellar magnetic fields**  
 . . solar magnetic field  
 RT electromagnetic fields  
 interstellar magnetic fields  
 magnetic field configurations  
 plasmas (physics)  
 pulsar magnetospheres  
 starspots  
 stellar activity  
 stellar convection  
 stellar magnetospheres

**stellar magnetospheres**

(added July 1988)

GS **stellar magnetospheres**  
 . pulsar magnetospheres  
 RT magnetic fields  
 ∞ magnetospheres  
 stellar atmospheres  
 stellar magnetic fields

**stellar magnitude**

DEF The measure of the relative brightness of a star. Stellar magnitudes are expressed in a variety of ways, according to the method or process of observation or determination.

GS magnitude  
 . **stellar magnitude**  
 RT astronomy  
 color-magnitude diagram  
 ∞ intensity  
 luminance  
 luminous intensity  
 red dwarf stars  
 stars  
 stellar color  
 stellar parallax

**stellar mass**

GS mass  
 . **stellar mass**  
 RT degenerate matter  
 galactic mass  
 main sequence stars  
 mass to light ratios  
 massive stars  
 novae  
 stellar gravitation  
 stellar temperature  
 supernovae  
 variable stars

**stellar mass accretion**

DEF Process by which a star accumulates matter as it moves through dense clouds of interstellar gas.

GS evolution (development)  
 . stellar evolution  
 . . **stellar mass accretion**  
 RT accretion disks  
 cosmology  
 dwarf novae  
 galactic evolution  
 gravitational effects  
 interstellar gas  
 interstellar matter  
 protostars  
 star formation  
 stellar envelopes  
 stellar physics  
 symbiotic stars  
 x ray binaries

**stellar mass ejection**

GS ejection  
 . **stellar mass ejection**

. . coronal mass ejection  
 RT asymptotic giant branch stars  
 cataclysmic variables  
 dwarf novae  
 magnetic clouds  
 novae  
 R Coronae Borealis stars  
 stellar activity  
 stellar envelopes  
 supernovae  
 variable stars  
 Wolf-Rayet stars

**stellar models**

GS models  
 . astronomical models  
 . . **stellar models**  
 RT astronomy  
 solar neutrinos  
 solar oscillations  
 stellar composition  
 stellar interiors  
 supermassive stars

**stellar motions**

GS **stellar motions**  
 . stellar orbits  
 . stellar oscillations  
 . . solar oscillations  
 . stellar rotation  
 . . solar rotation  
 RT companion stars  
 corotation  
 Doppler effect  
 Doppler-Fizeau effect  
 double stars  
 galactic rotation  
 Hipparcos satellite  
 ∞ motion  
 proper motion  
 sidereal time  
 stellar parallax  
 stellar systems

**stellar occultation**

GS occultation  
 . **stellar occultation**  
 RT asteroid detection  
 eclipsing binary stars  
 lunar occultation

**stellar orbits**

SN (EXCLUDES PLANETARY ORBITS)  
 GS orbits  
 . **stellar orbits**  
 stellar motions  
 . **stellar orbits**  
 RT celestial mechanics  
 Nemesis (star)  
 retrograde orbits

**stellar oscillations**

DEF Irregular fluctuations of the stellar atmospheres.

GS oscillations  
 . **stellar oscillations**  
 . . solar oscillations  
 stellar motions  
 . **stellar oscillations**  
 . . solar oscillations  
 RT asteroseismology  
 astronomical models  
 astronomy  
 astrophysics  
 atmospheric models  
 cataclysmic variables  
 Mira variables  
 stars  
 stellar activity  
 symbiotic stars  
 variable stars

**stellar parallax**

DEF The subtended angle at a star formed by the mean radius of the Earth's orbit; it indicates distance to a star.

GS parallax  
 . **stellar parallax**  
 RT astrometry  
 binary stars

## stellar physics

- Hipparcos satellite
- solar parallax
- stellar luminosity
- stellar magnitude
- stellar motions

### stellar physics

DEF A term that encompasses the physical properties of stars, such as luminosity, size, mass, density, temperature, chemical composition, evolution, activity, etc.

GS astrophysics

- . **stellar physics**

- . . solar physics

RT

- astroseismology
- local thermodynamic equilibrium
- nuclear astrophysics
- nuclear fusion
- ∞ science
- starquakes
- stellar activity
- stellar composition
- stellar convection
- stellar evolution
- stellar flares
- stellar interiors
- stellar luminosity
- stellar mass accretion
- stellar radiation
- stellar rotation
- stellar structure
- supernovae

### stellar radiation

GS extraterrestrial radiation

- . **stellar radiation**

- . . stellar winds

RT

- cosmic rays
- electromagnetic radiation
- galactic radiation
- gamma ray bursts
- Herbig-Haro objects
- interstellar extinction
- interstellar radiation
- light curve
- microwave emission
- polarized electromagnetic radiation
- ∞ radiation
- radiative transfer
- radio bursts
- radio stars
- solar radiation
- starspots
- stellar activity
- stellar flares
- stellar physics
- x ray stars

### stellar rotation

GS gyration

- . rotation

- . . **stellar rotation**

- . . . solar rotation

- stellar motions

- . **stellar rotation**

- . . solar rotation

RT

- angular momentum
- corotation
- planetary rotation
- starquakes
- stellar physics

### stellar seismology

(added March 2001)

USE **astroseismology**

### stellar spectra

GS spectra

- . radiation spectra

- . . electromagnetic spectra

- . . . **stellar spectra**

- . . . . solar spectra

RT

- absorption spectra
- astronomical spectroscopy
- color-color diagram
- continuous spectra
- cool stars
- emission spectra
- F stars
- G stars

- Herbig-Haro objects
- Hertzsprung-Russell diagram
- horizontal branch stars
- infrared spectra
- K stars
- line spectra
- molecular spectra
- peculiar stars
- Seyfert galaxies
- stellar color
- symbiotic stars
- ultraviolet spectra
- visible spectrum
- x ray spectra

### stellar spectrophotometry

GS optical measurement

- . photometry

- . . astronomical photometry

- . . . **stellar spectrophotometry**

- . . . spectrophotometry

- . . . . **stellar spectrophotometry**

- spectroscopy

- . astronomical spectroscopy

- . . **stellar spectrophotometry**

- . . spectrophotometry

- . . . **stellar spectrophotometry**

RT

- color-color diagram
- horizontal branch stars
- infrared photometry
- peculiar stars
- spectroscopic telescopes
- stellar color
- superhumps (astronomy)

### stellar structure

RT chromosphere

- coronal holes
- dense plasmas
- metallic stars
- peculiar stars
- solar atmosphere
- solar corona
- solar interior
- starquakes
- stellar composition
- stellar cores
- stellar envelopes
- stellar interiors
- stellar physics
- ∞ structures
- supermassive stars

### stellar systems

SN (EXCLUDES PLANETARY SYSTEMS)

DEF Gravitationally bound groups of stars.

SN (Excludes planetary systems).

GS celestial bodies

- . **stellar systems**

RT

- binary stars
- galactic clusters
- galactic rotation
- galactic structure
- galaxies
- gravitational collapse
- gravitational effects
- interacting galaxies
- Nemesis (star)
- Sigma Orionis
- star clusters
- star distribution
- stellar gravitation
- stellar motions
- triple stars

### stellar temperature

GS temperature

- . **stellar temperature**

RT

- cool stars
- stellar mass
- symbiotic stars

### stellar winds

GS extraterrestrial radiation

- . stellar radiation

- . . **stellar winds**

- particles

- . charged particles

- . . energetic particles

- . . . plasmas (physics)

- . . . . space plasmas
- . . . . . **stellar winds**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . space plasmas
- . . . . . **stellar winds**

RT

- chromosphere
- cosmic plasma
- galactic winds
- intergalactic media
- interstellar gas
- radiation pressure
- solar wind
- solar wind velocity

### stellarators

DEF Experimental thermonuclear devices where confinement in a magnetic field is achieved by closing the field upon itself and thus allowing the particles to perform endless spiral motion.

GS

- nuclear reactors
- . fusion reactors

- . . **stellarators**

RT

- helical windings
- heliotrons
- magnetohydrodynamics
- pinch effect
- plasma control
- thermal instability
- thermonuclear power generation
- thermonuclear reactions
- toroidal plasmas

### Stellite (trademark)

UF *Haynes Stellite*

RT

- chromium alloys
- cobalt alloys
- tungsten alloys

### stem cells

(added August 2004)

DEF Relatively undifferentiated cells that retain the ability to divide and proliferate throughout postnatal life to provide progenitor cells that can differentiate into specialized cells

GS

- cells (biology)

- . **stem cells**

RT

- biotechnology
- cell division
- culture techniques
- cytology

### stems

RT plants (botany)

### stencil processes

RT

- printing
- reproduction (copying)

### step faults

USE

**geological faults**

### step functions

GS functions (mathematics)

- . **step functions**

RT

- dynamic response
- frequency response
- intervals
- ramp functions
- reaction time
- ∞ steps

### step recovery diodes

DEF Varactors in which forward voltage injects carriers across the junction, but before the carriers can combine, the voltage reverses and carriers return to their origin in a group. The result is an abrupt cessation of reverse current and a harmonic rich waveform.

GS

- electronic equipment
- . diodes
- . . semiconductor diodes
- . . . junction diodes
- . . . . **step recovery diodes**
- . . . solid state devices
- . . semiconductor devices
- . . . junction diodes
- . . . . **step recovery diodes**

RT switching

**stepped leaders**  
(added August 1999)  
GS electric current  
  . electric discharges  
  . lightning  
  . . . leaders (meteorology)  
  . . . . **stepped leaders**

**steppes**  
GS landforms  
  . **steppes**  
RT arid lands  
  desertification  
  grasslands  
  plains

**stepping motors**  
DEF Motors whose rotations are in short and essentially uniform angular movements rather than a continuous motion.  
GS electromechanical devices  
  . electric motors  
  . . **stepping motors**  
  motors  
  . electric motors  
  . . **stepping motors**  
RT actuators  
  servocontrol  
  servomechanisms

**stepping switches**  
GS switches  
  . electric switches  
  . . **stepping switches**

∞ **steps**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT backward facing steps  
  programming (scheduling)  
  stairs  
  step functions

**STEREO (observatory)**  
(added July 2007)  
DEF Two nearly identical space-based observatories traveling in offset orbits to provide 3-D stereoscopic images of the sun. Launched on October 26, 2006 as part of NASA's Solar Terrestrial Probes Program, the observatories will be used to characterize coronal mass ejections, energetic particle acceleration in the low corona and interplanetary medium, and improve the determination of the structure of the ambient solar wind.  
UF *Solar Terrestrial Relations Observatory*  
GS observatories  
  . astronomical observatories  
  . . solar observatories  
  . . . **STEREO (observatory)**  
RT coronal mass ejection  
  solar activity  
  solar terrestrial interactions  
  space missions  
  stereoscopy

**stereochemistry**  
DEF Chemistry dealing with the arrangement of atoms and molecules in three dimensions.  
RT carbohydrates  
  ∞ chemistry  
  enantiomers  
  isomers  
  optical activity  
  spatial distribution  
  x ray analysis

*stereography*  
USE **stereophotography**

*stereolithography*  
USE **lithography**

**stereophonics**  
DEF The use of two sound channels to mimic normal hearing. Stereophonic satellite

broadcasting has now been developed.  
RT acoustics  
  hearing

**stereophotography**  
UF *stereography*  
  *stereoscopic photography*  
GS imagery  
  . photography  
  . . stereoscopy  
  . . . **stereophotography**  
RT aerial photography  
  black and white photography  
  cinematography  
  color photography  
  Mapsat  
  photogrammetry  
  SPOT (French satellite)

*stereoscopic photography*  
USE **stereophotography**

**stereoscopic vision**  
GS vision  
  . **stereoscopic vision**  
RT binocular vision  
  stereoscopy

**stereoscopy**  
GS imagery  
  . photography  
  . . **stereoscopy**  
  . . . stereophotography  
RT STEREO (observatory)  
  stereoscopic vision

**stereotelevision**  
GS communication equipment  
  . **stereotelevision**  
  telecommunication  
  . **stereotelevision**  
  television systems  
  . **stereotelevision**  
RT closed circuit television  
  color television  
  communicating  
  educational television  
  satellite television  
  spacecraft television

**sterilization**  
GS cleaning  
  . **sterilization**  
  . . chemical sterilization  
  . . . spacecraft sterilization  
RT air purification  
  antifouling  
  antiseptics  
  bactericides  
  baking  
  decontamination  
  fumigation  
  gnatobiotics  
  housekeeping (spacecraft)  
  ionizing radiation  
  mercury lamps  
  pasteurizing  
  purification  
  ultraviolet radiation

**sterilization effects**  
RT chemical effects  
  corrosion  
  decontamination  
  degradation  
  ∞ deoxygenation  
  ∞ effects  
  radiation effects  
  spacecraft sterilization  
  temperature effects  
  thermal degradation

*sterns*  
USE **afterbodies**

**sternum**  
GS anatomy  
  . musculoskeletal system  
  . . bones  
  . . . **sternum**

RT thorax

**steroids**  
GS organic compounds  
  . lipids  
  . . **steroids**  
  . . . cholesterol  
  . . . corticosteroids  
  . . . . aldosterone  
  . . . . hydrocortisone  
  . . . . . cortisone  
  . . . . . glucocorticoids  
  . . . . . estrogens  
  . . . prostaglandins  
RT antibiotics  
  hormones

**stethoscopes**  
GS medical equipment  
  . **stethoscopes**  
RT physicians

**stiction**  
(added May 2003)  
DEF Adhesion between two bodies in contact due to surface forces.  
GS surface properties  
  . adhesion  
  . . **stiction**  
RT friction  
  interfacial energy

**Stieltjes integral**  
GS analysis (mathematics)  
  . real variables  
  . . measure and integration  
  . . . **Stieltjes integral**  
RT probability theory

*stiff structures*  
USE **rigid structures**

**stiffening**  
RT reinforcement (structures)  
  ribs (supports)  
  webs (supports)

**stiffness**  
DEF The ratio of change of force (or torque) to the corresponding change in translational (or rotational) displacement of an elastic element.  
GS mechanical properties  
  . **stiffness**  
RT bending  
  deformation  
  flexibility  
  modulus of elasticity  
  ∞ rigidity  
  softness  
  structural stability

**stiffness matrix**  
GS algebra  
  . vector spaces  
  . . matrices (mathematics)  
  . . . **stiffness matrix**  
RT structural analysis  
  structural members

**stigmatism**  
GS electromagnetic properties  
  . optical properties  
  . . **stigmatism**  
RT astigmatism  
  focusing  
  lens design  
  lenses

**stilbene**  
GS organic compounds  
  . hydrocarbons  
  . . **stilbene**  
RT dyes  
  hexanitrostilbene

**stills**  
GS separators  
  . **stills**  
RT concentrators

**stimulants**

distillation equipment

**stimulants**

- GS drugs
  - . **stimulants**
  - . . atropine
  - . . caffeine
  - . . central nervous system stimulants
  - . . norepinephrine
- RT aminophylline
- epinephrine
- strychnine

**stimulated emission**

- GS emission
  - . **stimulated emission**
- RT argon lasers
- carbon dioxide lasers
- carbon lasers
- carbon monoxide lasers
- coherent electromagnetic radiation
- coherent light
- electron emission
- electron pumping
- gallium arsenide lasers
- gas lasers
- gas masers
- HCN lasers
- interstellar masers
- lasers
- light emission
- masers
- nuclear pumping
- optical pumping
- particle emission
- photoelectric emission
- population inversion
- rapid ballistics identification
- rare gas-halide lasers
- self sustained emission
- surface emitting lasers
- TEA lasers
- two-wavelength lasers
- ultrashort pulsed lasers
- ultraviolet lasers

**stimulated emission devices**

- UF *quantum generators*
- GS **stimulated emission devices**
  - . lasers
  - . . airborne lasers
  - . . argon lasers
  - . . atmospheric lasers
  - . . carbon lasers
  - . . chemical lasers
  - . . . HCL lasers
  - . . . HCL argon lasers
  - . . . chemical oxygen-iodine lasers
  - . . continuous wave lasers
  - . . distributed feedback lasers
  - . . free electron lasers
  - . . gamma ray lasers
  - . . gas lasers
  - . . . carbon dioxide lasers
  - . . . carbon monoxide lasers
  - . . . DF lasers
  - . . . excimer lasers
  - . . . HCL lasers
  - . . . HCL argon lasers
  - . . . HCN lasers
  - . . . helium-neon lasers
  - . . . HF lasers
  - . . . nitrogen lasers
  - . . . rare gas-halide lasers
  - . . . krypton fluoride lasers
  - . . . . xenon chloride lasers
  - . . . . xenon fluoride lasers
  - . . . TEA lasers
  - . . . ultraviolet lasers
  - . . gasdynamic lasers
  - . . glass lasers
  - . . high power lasers
  - . . . Nova Laser System
  - . . . Shiva laser system
  - . . infrared lasers
  - . . injection lasers
  - . . quantum cascade lasers
  - . . iodine lasers
  - . . . chemical oxygen-iodine lasers
  - . . liquid lasers

- . . metal vapor lasers
- . . neodymium lasers
- . . nuclear pumped lasers
- . . organic lasers
- . . . dye lasers
- . . plasmadynamic lasers
- . . pulsed lasers
- . . . Q switched lasers
- . . . ultrashort pulsed lasers
- . . . ultraviolet lasers
- . . Raman lasers
- . . ring lasers
- . . semiconductor lasers
- . . . aluminum gallium arsenide lasers
- . . . gallium arsenide lasers
- . . . quantum cascade lasers
- . . . quantum well lasers
- . . . YLF lasers
- . . . solar-pumped lasers
- . . solid state lasers
- . . . aluminum gallium arsenide lasers
- . . . DBR lasers
- . . . fiber lasers
- . . . gallium arsenide lasers
- . . . quantum cascade lasers
- . . . quantum well lasers
- . . . ruby lasers
- . . . YAG lasers
- . . . YLF lasers
- . . spaceborne lasers
- . . surface emitting lasers
- . . tunable lasers
- . . two-wavelength lasers
- . . waveguide lasers
- . . . fiber lasers
- . . x ray lasers
- . . masers
- . . gas masers
- . . . hydrogen masers
- . . interstellar masers
- . . proton masers
- . . traveling wave masers
- . . water masers

- RT amplifiers
- coherent electromagnetic radiation
- diffraction radiation
- electron pumping
- ∞ generators
- laser arrays
- laser cavities
- laser pumping
- laser weapons
- lasing
- light transmission
- nuclear pumping
- optical pumping
- rapid ballistics identification
- subharmonic generators
- transient oscillations

**stimulation**

- GS **stimulation**
  - . auditory stimuli
  - . sensory stimulation
- RT activation
- activation (biology)
- actuation
- cloud seeding
- gas injection
- initiation
- pressurizing
- starting

∞ **stimuli**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT arousal
- auditory stimuli
- caloric stimuli
- electric stimuli
- motivation
- psychological factors
- subliminal stimuli
- visual stimuli
- zeitgebers

**Stirling cycle**

DEF A theoretical heat engine cycle in which heat is added at constant volume, fol-

lowed by isothermal expansion with heat addition. The heat is then rejected at constant volume, followed by isothermal compression with heat rejection.

- GS cycles
  - . thermodynamic cycles
  - . . **Stirling cycle**
- RT Carnot cycle
- solar dynamic power systems
- Stirling engines

**Stirling engines**

- GS engines
  - . external combustion engines
  - . . **Stirling engines**
  - . . piston engines
  - . . **Stirling engines**
- RT automobile engines
- engine design
- engine tests
- free-piston engines
- linear alternators
- Stirling cycle

**stirring**

- RT aeration
- dispersing
- friction stir welding
- mixers
- suspending (mixing)
- swirling

**stishovite**

- DEF A mineral consisting essentially of silicon trioxide.
- GS chalcogenides
  - . oxides
  - . . dioxides
  - . . . silicon dioxide
  - . . . . quartz
  - . . . . **stishovite**
  - . . silicon oxides
  - . . . silicon dioxide
  - . . . quartz
  - . . . . **stishovite**
  - . . minerals
  - . quartz
  - . . **stishovite**
  - . silicon compounds
  - . silicon oxides
  - . . silicon dioxide
  - . . . quartz
  - . . . . **stishovite**
- RT coesite
- Earth crust
- Earth mantle
- rutile

**stochastic processes**

- DEF Ordered sets of observations in one or more dimensions, each being considered as a sample of one item from a probability distribution. Used for Poisson process.
- UF *poisson process*
- GS **stochastic processes**
  - . Markov processes
  - . . Markov chains
  - . . random processes
  - . . random walk
- RT ∞ applications of mathematics
- attractors (mathematics)
- autoregressive moving average
- chaos
- coherence coefficient
- decision theory
- differential games
- ergodic process
- events
- Fokker-Planck equation
- game theory
- information theory
- Kakutani theorem
- Kalman-Schmidt filtering
- martingales
- mathematical models
- Monte Carlo method
- operations research
- probability theory
- queueing theory
- random errors

- random noise
- random signals
- state estimation
- statistical analysis
- ∞ statistics
- time dependence
- time functions
- time series analysis
- stockpiling**
  - RT accumulations
  - collection
  - inventory management
  - logistics
  - reserves
  - ∞ storage
  - strategic materials
- stoichiometry**
  - RT chemical reactions
  - ∞ chemistry
  - ∞ composition
  - composition (property)
  - formulations
  - material balance
  - phase diagrams
- Stokes flow**
  - GS fluid flow
    - . incompressible flow
    - . . **Stokes flow**
    - . viscous flow
    - . . **Stokes flow**
  - RT Oseen approximation
  - steady flow
- ∞ **Stokes law**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT laws
    - Maxwell equation
    - Stokes law (fluid mechanics)
    - Stokes theorem (vector calculus)
- Stokes law (fluid mechanics)**
  - RT settling
  - ∞ Stokes law
  - viscosity
- Stokes law of radiation**
  - GS laws
    - . radiation laws
    - . . **Stokes law of radiation**
  - RT incident radiation
  - luminescence
  - ∞ radiation
  - wavelengths
- Stokes theorem (vector calculus)**
  - GS algebra
    - . vector spaces
    - . . **Stokes theorem (vector calculus)**
    - theorems
    - . **Stokes theorem (vector calculus)**
  - RT ∞ Stokes law
- Stokes-Beltrami equation**
  - RT ∞ equations
    - Laplace equation
    - stream functions (fluids)
- STOL aircraft*
  - USE **short takeoff aircraft**
- stomach**
  - GS anatomy
    - . digestive system
    - . . gastrointestinal system
    - . . . **stomach**
  - RT abdomen
- stones (rocks)*
  - USE **rocks**
- stony meteorites**
  - GS celestial bodies
    - . meteorites
    - . . **stony meteorites**
    - . . . achondrites
    - . . . Bondoc meteorite
    - . . . chassignites
    - . . . Kapoeta achondrite
    - . . . nakhlites
    - . . . Norton County achondrite
    - . . . shergottites
    - . . . SNC meteorites
    - . . . ureilites
    - . . . carbonaceous meteorites
    - . . . carbonaceous chondrites
    - . . . Alais meteorite
    - . . . Allende meteorite
    - . . . Cold Bokkeveld meteorite
    - . . . Ivuna meteorite
    - . . . Murchison meteorite
    - . . . Murray meteorite
    - . . . Orgueil meteorite
    - . . . Tonk meteorite
    - . . . ureilites
    - . . . chondrites
    - . . . Bruderheim meteorite
    - . . . carbonaceous chondrites
    - . . . Alais meteorite
    - . . . Allende meteorite
    - . . . Cold Bokkeveld meteorite
    - . . . Ivuna meteorite
    - . . . Murchison meteorite
    - . . . Murray meteorite
    - . . . Orgueil meteorite
    - . . . Tonk meteorite
    - . . . Harleton meteorite
    - . . . Hvittis chondrite
    - . . . Okhansk meteorite
    - . . . Pantar chondrites
    - . . . Pribram meteorite
    - . . . tektites
    - . . . australites
    - . . . bediasites
    - . . . Tungusk meteorite
  - RT coesite
  - iron meteorites
  - Lazarev meteorite
  - meteoritic composition
  - meteoritic microstructures
  - schreibersite
  - stony-iron meteorites
- stony-iron meteorites**
  - (added December 1988)
  - GS celestial bodies
    - . meteorites
    - . . **stony-iron meteorites**
  - RT iron meteorites
  - stony meteorites
- stopcocks*
  - USE **cocks**
- stopping**
  - UF *terminating*
  - GS **stopping**
    - . thrust termination
  - RT blocking
  - cancellation
  - closing
  - constrictions
  - containment
  - damping
  - deceleration
  - delay
  - elimination
  - ∞ holding
  - ∞ inhibition
  - optimization
  - plugs
  - prevention
  - ∞ reduction
  - retarding
  - sealing
- stopping power**
  - RT absorbers (materials)
  - absorption cross sections
  - ∞ cross sections
  - density (mass/volume)
  - neutron cross sections
  - radiation absorption
  - radiation shielding
- scattering cross sections
- storage batteries**
  - GS consumables (spacecraft)
    - . **storage batteries**
    - propellants
    - . **storage batteries**
  - RT cryogenic rocket propellants
  - gaseous rocket propellants
  - gelled rocket propellants
  - ground support equipment
  - high temperature propellants
  - hydrocarbon fuels
  - hypergolic rocket propellants
  - liquid rocket propellants
  - propellant additives
  - propellant decomposition
  - propellant evaporation
  - propellant sensitivity
  - propellant storability
  - propellant storage
  - rocket propellants
  - solid propellants
  - space storage
- ∞ **storage**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT buffer storage
  - computer storage devices
  - core storage
  - cryogenic fluid storage
  - data storage
  - disposal
  - document storage
  - energy storage
  - external store separation
  - external stores
  - fluid filled shells
  - handling equipment
  - inventories
  - inventory controls
  - inventory management
  - ion storage
  - liquid filled shells
  - logistics
  - logistics management
  - magnetic storage
  - materials handling
  - missile silos
  - missile storage
  - packaging
  - pipelines
  - preserving
  - propellant storage
  - racks (frames)
  - recording
  - reserves
  - retaining
  - safety
  - space storage
  - stockpiling
  - storage tanks
  - stowage (onboard equipment)
  - underground storage
  - waste disposal
  - wing-fuselage stores
- storage batteries**
  - SN (RECHARGEABLE BATTERIES)
  - UF *secondary batteries*
  - GS electrochemical cells
    - . electric batteries
    - . . **storage batteries**
    - . . . lead acid batteries
    - . . . nickel cadmium batteries
    - . . . nickel hydrogen batteries
    - . . . nickel zinc batteries
    - . . . silver cadmium batteries
    - . . . silver hydrogen batteries
    - . . . silver zinc batteries
    - . . . zinc-bromide batteries
    - . . . zinc-chlorine batteries
  - RT alkaline batteries
  - battery chargers
  - charge efficiency
  - dry cells
  - electrolytes
  - lithium batteries



## storage rings (particle accelerators)

metal air batteries  
nickel iron batteries  
nonaqueous electrolytes  
primary batteries  
pulse charging  
regenerative fuel cells

### storage rings (particle accelerators)

UF *electron ring accelerators*  
GS particle accelerators  
. cyclic accelerators  
. . . synchrotrons  
. . . **storage rings (particle accelerators)**

RT ∞ accelerators

Q values (nuclear physics)

∞ rings

superconducting super collider

### storage stability

GS life (durability)  
. **storage stability**  
stability

. **storage stability**

RT decomposition

liquid sloshing

long term effects

static stability

surface stability

thermal stability

### storage tanks

GS tanks (containers)

. **storage tanks**

RT cryogenic fluid storage

cryogenic tanks

cylindrical tanks

expulsion bladders

external tanks

fuel tanks

pipelines

pressure vessels

propellant tanks

space storage

spherical tanks

∞ storage

tank geometry

underground storage

wing-fuselage stores

*store release*

USE **external store separation**

### storm damage

GS damage

. **storm damage**

RT cyclones

flood control

floods

gusts

hailstorms

hurricanes

landslides

precipitation (meteorology)

rainstorms

snow cover

storm surges

storms

thunderstorms

tornadoes

tropical storms

typhoons

wind (meteorology)

### storm enhancement

GS weather modification

. **storm enhancement**

RT climatology

hailstorms

precipitation (meteorology)

rainstorms

snowstorms

storms

storms (meteorology)

### storm suppression

GS weather modification

. **storm suppression**

RT climatology

hailstorms

ice prevention  
precipitation (meteorology)  
rainstorms  
snowstorms  
storms

### storm surges

RT coasts

hurricanes

ocean surface

oceanography

storm damage

storms (meteorology)

surges

### storms

GS

#### storms

. ionospheric storms

. . sudden ionospheric disturbances

. magnetic storms

. . polar substorms

. noise storms

. solar storms

. storms (meteorology)

. . cyclones

. . . hurricanes

. . . . Anna hurricane

. . . typhoons

. . downbursts

. . . microbursts (meteorology)

. . dust storms

. . hailstorms

. . rainstorms

. . . thunderstorms

. . snowstorms

. . tornadoes

. . tropical storms

. . . hurricanes

. . . . Anna hurricane

. . . typhoons

RT climatology

cold fronts

∞ disturbances

flood damage

floods

fronts (meteorology)

gusts

precipitation (meteorology)

snow cover

solar terrestrial interactions

storm damage

storm enhancement

storm suppression

sudden storm commencements

warm fronts

weather forecasting

wind (meteorology)

### storms (meteorology)

GS storms

. **storms (meteorology)**

. . cyclones

. . . hurricanes

. . . . Anna hurricane

. . . typhoons

. . downbursts

. . . microbursts (meteorology)

. . dust storms

. . hailstorms

. . rainstorms

. . . thunderstorms

. . snowstorms

. . tornadoes

. . tropical storms

. . . hurricanes

. . . . Anna hurricane

. . . typhoons

RT Alpine meteorology

climatology

cyclogenesis

flight conditions

flood control

flood damage

flood predictions

floods

GOES 13

ground wind

gusts

hail

ice

meteorological parameters  
meteorology  
precipitation (meteorology)  
snow  
snow cover  
squalls  
storm enhancement  
storm surges  
watersheds  
weather forecasting  
wind (meteorology)

### StormSat satellite

DEF A synchronous Earth-pointing satellite for severe storms studies. Used for Severe Storms Observing Satellite.

UF *Severe Storms Observing Satellite*

GS artificial satellites

. synchronous satellites

. . **StormSat satellite**

RT NASA programs

*Stoss-and-Lee topography*

USE **glacial drift**

### STOVL aircraft

(added July 1991)

UF *short takeoff & vertical landing aircraft*

RT fighter aircraft

lift augmentation

powered lift aircraft

short takeoff aircraft

V/STOL aircraft

vertical landing

### stowage (onboard equipment)

RT logistics

onboard equipment

portable equipment

provisioning

space logistics

space rations

∞ storage

*straight wings*

USE **rectangular wings**

*strain aging*

USE **precipitation hardening**

### strain distribution

GS distribution (property)

. **strain distribution**

RT crack propagation

deformation

elastic deformation

fracture mechanics

plastic deformation

strain measurement

strain rate

stress concentration

stress distribution

stress-strain relationships

### strain energy methods

GS structural analysis

. energy methods

. . **strain energy methods**

RT ∞ energy

∞ methodology

seismic energy

### strain energy release rate

GS rates (per time)

. **strain energy release rate**

RT elastic deformation

elastic properties

relaxation (mechanics)

strain rate

stress relaxation

*strain fatigue*

USE **fatigue (materials)**

### strain gage accelerometers

GS measuring instruments

. accelerometers

. . **strain gage accelerometers**

- RT pressure gages
- strain gage balances**  
 GS measuring instruments  
 . indicating instruments  
 . . weight indicators  
 . . . **strain gage balances**  
 RT pressure gages
- strain gages**  
 DEF Instruments used to measure the strain of distortion in a member or test specimen (such as a structural part) subjected to a force.  
 GS measuring instruments  
 . **strain gages**  
 RT cable force recorders  
 deformeters  
 elastometers  
 extensometers  
 flight load recorders  
 mechanical measurement  
 piezoelectric gages  
 pressure gages  
 rosette shapes  
 shock measuring instruments  
 strain measurement  
 stress measurement  
 temperature inversions  
 tensometers  
 transducers  
 weight indicators
- strain hardening**  
 GS hardening (materials)  
 . work hardening  
 . . **strain hardening**  
 RT aging (materials)  
 aging (metallurgy)  
 precipitation hardening  
 residual stress  
 shot peening  
 stress relieving  
 temperature inversions
- strain measurement**  
 RT  $\infty$  measurement  
 shearography  
 smart structures  
 strain distribution  
 strain gages  
 strain rate  
 stress-strain diagrams  
 stress-strain relationships  
 structural strain
- strain rate**  
 GS rates (per time)  
 . **strain rate**  
 RT impact tests  
 loading rate  
 mechanical properties  
 Portevin-le Chatelier effect  
 strain distribution  
 strain energy release rate  
 strain measurement  
 temperature inversions
- strain softening*  
 USE **plastic deformation**
- straits**  
 DEF Relatively narrow waterways connecting two larger bodies of water.  
 GS passageways  
 . **straits**  
 . . Torres Strait  
 RT canals  
 Gibraltar  
 lakes  
 seas  
 water  
 waterways
- strakes**  
 GS structural members  
 . **strakes**  
 RT aerodynamic configurations  
 hulls (structures)  
 longerons  
 metal strips
- rectangular panels  
 reinforcement (structures)  
 water tunnel tests
- strands**  
 RT cables (ropes)  
 ceramic fibers  
 cordage  
 fibers  
 $\infty$  filaments  
 mesh  
 yarns
- strange attractors**  
 DEF Abstract geometrical objects in theoretical physics that represent motion which is bounded but not periodic. Their detailed behavior is sensitive to external perturbations, but their overall qualitative behavior is stable. They are of particular interest in the study of turbulence.  
 GS attractors (mathematics)  
 . **strange attractors**  
 RT chaos  
 fractals  
 imbeddings (mathematics)  
 iterative solution  
 nonlinear systems  
 numerical stability  
 perturbation theory  
 $\infty$  physics  
 recursive functions  
 state vectors  
 theoretical physics  
 turbulence
- strangeness**  
 RT hyperons  
 mesons  
 parity  
 quantum mechanics
- strapdown inertial guidance**  
 GS guidance (motion)  
 . inertial guidance  
 . . **strapdown inertial guidance**  
 RT inertial navigation
- straps**  
 RT anchors (fasteners)  
 $\infty$  bands  
 clamps  
 fasteners  
 holders
- strata**  
 UF *stratified layers*  
 GS **strata**  
 . substrates  
 RT anticlines  
 bedrock  
 beds (geology)  
 crossbedding (geology)  
 flat layers  
 folds (geology)  
 geosynclines  
 $\infty$  layers  
 stratification  
 synclines  
 underground acoustics
- strategic materials**  
 DEF Critical raw materials whose foreign source of supply is uncertain and subject to potential cutoff. Examples of such materials are chromium, cobalt, manganese, and platinum group metals.  
 RT chromium  
 cobalt  
 manganese  
 $\infty$  materials  
 metals  
 stockpiling  
 technology assessment
- strategy**  
 RT decision theory  
 deployment  
 electronic warfare  
 game theory  
 $\infty$  operations
- operations research  
 risk  
 warfare
- stratification**  
 GS **stratification**  
 . atmospheric stratification  
 . intercalation  
 RT anticlines  
 bedrock  
 crossbedding (geology)  
 flat layers  
 folds (geology)  
 geosynclines  
 $\infty$  layers  
 static stability  
 strata  
 stratified flow  
 stratigraphy  
 synclines  
 temperature gradients  
 thermoclines
- stratified flow**  
 GS fluid flow  
 . laminar flow  
 . . **stratified flow**  
 RT baroclinic waves  
 baroclinity  
 coaxial flow  
 flow geometry  
 shear flow  
 stratification
- stratified layers*  
 USE **strata**
- stratigraphy**  
 DEF That branch of geology which treats of the formation, composition, sequence, and correlation of the stratified rocks as part of the Earth's crust.  
 GS **stratigraphy**  
 . magnetostratigraphy  
 RT anticlines  
 bedrock  
 beds (geology)  
 crossbedding (geology)  
 $\infty$  formation  
 formations  
 geochronology  
 geology  
 geophysics  
 geosynclines  
 hydrogeology  
 mines (excavations)  
 paleontology  
 particle tracks  
 petrology  
 plateaus  
 regolith  
 rocks  
 sedimentary rocks  
 stratification  
 synclines  
 wells
- stratocumulus clouds**  
 GS clouds (meteorology)  
 . **stratocumulus clouds**  
 RT cumulus clouds  
 stratus clouds
- Stratofortress aircraft*  
 USE **B-52 aircraft**
- Stratojet aircraft*  
 USE **B-47 aircraft**
- stratopause**  
 SN (ALTITUDE APPROXIMATELY 50 KM)  
 GS Earth atmosphere  
 . middle atmosphere  
 . . stratosphere  
 . . . **stratopause**  
 RT mesopause

## stratoscope telescopes

mesosphere

*Stratoscope 1 telescope*  
USE **stratoscope telescopes**

*Stratoscope 2 telescope*  
USE **stratoscope telescopes**

**stratoscope telescopes**  
UF *Stratoscope 1 telescope*  
*Stratoscope 2 telescope*  
GS telescopes  
. spectroscopic telescopes  
. . **stratoscope telescopes**  
RT balloons  
reflecting telescopes  
refracting telescopes

**stratosphere**  
SN (ALTITUDE RANGE BETWEEN APPROXIMATELY 15 AND 50 KM)  
DEF Region of the atmosphere between the troposphere and mesosphere, having a lower boundary about 8 km. at the poles to 15 km. at the equator and an upper boundary of about 50 km.  
GS Earth atmosphere  
. middle atmosphere  
. . **stratosphere**  
. . . ozonosphere  
. . . stratopause  
RT chemosphere  
homosphere  
ice clouds  
isothermal layers  
stratospheric warming

**stratosphere radiation**  
DEF Any infrared radiation involved in the complex infrared exchange continually proceeding within the stratosphere.  
GS atmospheric radiation  
. **stratosphere radiation**  
RT corpuscular radiation  
electromagnetic radiation  
∞ radiation  
sky radiation  
tropospheric radiation

*Stratospheric Aerosol & Gas Experiment*  
USE **SAGE satellite**

*Stratospheric Observatory for IR Astronomy*  
USE **SOFIA (airborne observatory)**

**stratospheric warming**  
(added October 1988)  
DEF A temperature rise in the global stratosphere.  
GS heating  
. atmospheric heating  
. . **stratospheric warming**  
RT anomalous temperature zones  
atmospheric heat budget  
atmospheric temperature  
climate change  
global warming  
isothermal layers  
stratosphere

*Stratotanker aircraft*  
USE **C-135 aircraft**

**stratus clouds**  
GS clouds (meteorology)  
. **stratus clouds**  
RT fog  
nimbostratus clouds  
stratocumulus clouds

**streak cameras**  
DEF Cameras for measuring radiation pulses by deflection of an electron beam.  
GS optical equipment  
. cameras  
. . **streak cameras**  
photographic equipment  
. cameras  
. . **streak cameras**  
RT camera shutters  
cinematography

lenses

**streak photography**  
DEF The process of taking a time exposure photograph of a tracer particle in a fluid; the photograph reveals the motion of each tracer particle in the form of a streak which may be interpreted as a velocity vector.

GS imagery  
. photography  
. . **streak photography**  
RT cameras  
electro-optical photography  
high speed cameras  
imaging techniques

**stream functions (fluids)**  
RT incompressible flow  
potential theory  
Stokes-Beltrami equation  
streams  
two dimensional flow

*streamline flow*  
USE **laminar flow**

**streamlined bodies**  
GS symmetrical bodies  
. **streamlined bodies**  
. . fairings  
RT aerodynamic configurations  
airfoils  
axisymmetric bodies  
∞ bodies  
bodies of revolution  
missile bodies  
ogives  
slender bodies  
streamlining  
towed bodies

**streamlining**  
RT acoustic streaming  
air flow  
aircraft design  
aircraft structures  
airfoil profiles  
airfoils  
fairings  
fluid dynamics  
friction reduction  
helicopter design  
hydrofoils  
∞ profiles  
skin friction  
streamlined bodies

**streams**  
DEF Bodies of flowing water, great or small, contained within channels as well as uncontained fluids such as air.  
GS **streams**  
. gas streams  
RT air flow  
alluvium  
aquifers  
Delaware River Basin (US)  
fluid flow  
gas flow  
hydrology  
hydrology models  
International Hydrological Decade  
Lake Erie  
Lake Huron  
Lake Michigan  
Lake Ontario  
Lake Superior  
limnology  
meanders  
rapids  
reservoirs  
rivers  
stream functions (fluids)  
surface water  
Susquehanna River Basin (MD-NY-PA)  
wadis

**streets**  
RT highways

intersections  
pavements  
roads  
∞ tunnels  
urban planning  
urban research

∞ **strength**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cold strength  
compressive strength  
creep rupture strength  
creep strength  
dispersion strengthening  
electric field strength  
fiber strength  
field strength  
flexural strength  
fracture strength  
high strength  
impact strength  
load carrying capacity  
mechanical properties  
microyield strength  
muscular strength  
notch strength  
residual strength  
shear strength  
tensile strength  
weld strength  
yield strength

*strength of materials*  
USE **mechanical properties**

**streptococcus**  
GS microorganisms  
. bacteria  
. . **streptococcus**

**streptomyces**  
GS microorganisms  
. bacteria  
. . **streptomyces**

**streptomycin**  
GS drugs  
. antibiotics  
. . **streptomycin**

**stress (biology)**  
DEF The effect of a physiological, psychological, or mental load on a biological organism which causes fatigue and tends to degrade proficiency.

GS **stress (biology)**  
. acceleration stresses (physiology)  
. . centrifuging stress  
. . flight stress (biology)  
. . space flight stress  
. plant stress  
. stress (psychology)  
RT acclimatization  
anxiety  
deprivation  
exercise physiology  
fatigue (biology)  
pathological effects  
psychological effects

**stress (physiology)**  
GS **stress (physiology)**  
. acceleration stresses (physiology)  
. . centrifuging stress  
RT acceleration (physics)  
acclimatization  
aeroembolism  
angina pectoris  
anoxia  
biodynamics  
deprivation  
exercise physiology  
fatigue (biology)  
flight stress (biology)  
gravitational physiology  
homeostasis  
hyperkinesia  
hypoxia  
lower body negative pressure

- muscular fatigue  
Palmar sweat index  
physiology  
pressure breathing  
space flight stress  
stress (psychology)  
underwater physiology
- stress (psychology)**  
UF *mental stress*  
GS stress (biology)  
  . **stress (psychology)**  
RT fatigue (biology)  
flight stress (biology)  
mental performance  
Palmar sweat index  
psychological effects  
psychological factors  
psychology  
space flight stress  
space psychology  
stress (physiology)  
workloads (psychophysiology)
- stress analysis**  
UF *stress calculations*  
GS **stress analysis**  
  . Schwartz method  
  . x ray stress analysis  
RT Airy function  
∞ analyzing  
bending moments  
bending theory  
boundary element method  
Castigliano variational theorem  
combined stress  
construction  
creep analysis  
Donnell equations  
energy methods  
Euler buckling  
∞ flight stress  
fringe multiplication  
inelastic stress  
influence coefficient  
interference fit  
isoparametric finite elements  
mechanical engineering  
Michell theorem  
Moire fringes  
moments of inertia  
NASTRAN  
photoelastic analysis  
photoelasticity  
Reissner theory  
Saint Venant principle  
shallow shell equations  
S-N diagrams  
stresses  
structural analysis  
structural design  
structural engineering  
temperature inversions
- stress calculations*  
USE **stress analysis**
- stress concentration**  
DEF In structures, a localized area of high stress.  
GS distribution (property)  
  . stress distribution  
  . . **stress concentration**  
RT combined stress  
concentrating  
crack initiation  
cracking (fracturing)  
Elber equation  
fatigue (materials)  
fatigue tests  
force distribution  
fringe multiplication  
hole distribution (mechanics)  
hole geometry (mechanics)  
impact strength  
impact tests  
loads (forces)  
mechanical properties  
micromechanics  
Moire fringes
- moment distribution  
notch strength  
notch tests  
perforated plates  
perforated shells  
plane stress  
Saint Venant principle  
strain distribution  
stresses  
stress-strain relationships  
structural strain
- stress corrosion**  
GS corrosion  
  . **stress corrosion**  
  . . stress corrosion cracking  
RT cracking (fracturing)  
fretting corrosion  
intergranular corrosion  
metal fatigue  
salt spray tests  
transgranular corrosion
- stress corrosion cracking**  
GS corrosion  
  . stress corrosion  
  . . **stress corrosion cracking**  
  fracturing  
  . cracking (fracturing)  
  . . **stress corrosion cracking**  
RT corrosion tests  
crack closure  
crack initiation  
crack propagation  
metal fatigue
- stress cycles**  
DEF A variation of stress with time, repeated periodically and identically.  
GS cycles  
  . **stress cycles**  
  mechanical properties  
  . **stress cycles**  
RT cyclic loads  
Elber equation  
fatigue (materials)  
fatigue life  
fatigue tests  
S-N diagrams  
stresses  
variable amplitude loading
- stress distribution**  
UF *stress fields*  
GS distribution (property)  
  . **stress distribution**  
  . . stress concentration  
RT crack propagation  
force distribution  
fracture mechanics  
interlaminar stress  
strain distribution  
stress intensity factors  
stress-strain relationships  
transverse loads
- stress fields*  
USE **stress distribution**
- stress functions**  
UF *von Mises theory*  
GS functions (mathematics)  
  . **stress functions**  
RT fracturing
- stress intensity factors**  
DEF Load-induced variables in tension, compression, and/or shear which are conducive to crack initiation and propagation and fatigue fracture in materials.  
RT bending theory  
combined stress  
crack initiation  
crack propagation  
cracking (fracturing)  
edge cracks  
force distribution  
fracture mechanics  
hole geometry (mechanics)  
loads (forces)
- notch strength  
plane strain  
stress distribution  
tensile stress
- stress measurement**  
GS mechanical measurement  
  . **stress measurement**  
  . . x ray stress measurement  
RT deformeters  
extensometers  
photoelastic analysis  
shearography  
S-N diagrams  
strain gages  
tensometers  
vibration measurement
- stress propagation**  
GS transmission  
  . **stress propagation**  
RT elastic waves  
plastic deformation  
∞ propagation
- stress ratio**  
DEF The ratio of the minimum stress to the maximum stress occurring in one stress cycle.  
GS mechanical properties  
  . **stress ratio**  
  ratios  
  . **stress ratio**  
RT fatigue (materials)  
fatigue tests  
modular ratios  
pressure ratio  
S-N diagrams
- stress relaxation**  
DEF The decrease in stress after a given time at constant strain.  
GS mechanical properties  
  . **stress relaxation**  
  relaxation (mechanics)  
  . **stress relaxation**  
RT anelasticity  
Bordoni peaks  
creep analysis  
creep diagrams  
creep properties  
ductility  
fatigue (materials)  
plastic deformation  
plastic flow  
plastic memory  
plastic properties  
∞ recovery  
residual stress  
shear properties  
strain energy release rate  
stresses  
temperature inversions
- stress relieving**  
GS heat treatment  
  . **stress relieving**  
  relieving  
  . **stress relieving**  
RT alloys  
annealing  
fatigue (materials)  
∞ recovery  
residual stress  
stabilization  
strain hardening  
tempering
- stress rupture strength*  
USE **creep rupture strength**
- stress tensors**  
DEF Complete sets of stress components in a solid or fluid medium.  
GS algebra  
  . tensors  
  . . **stress tensors**  
RT continuum mechanics  
elastic properties  
fracture mechanics  
plastic properties

## stress waves

structural design

### stress waves

GS elastic waves  
. **stress waves**  
RT acoustic emission  
shock layers  
shock waves  
stresses  
temperature inversions  
wave propagation  
∞ waves

### stressed-skin structures

RT monocoque structures  
skin (structural member)  
spherical shells  
∞ structures  
thin walled shells

### stresses

DEF The forces per unit area of a body that tends to produce a deformation.

GS **stresses**  
. axial stress  
. combined stress  
. critical loading  
. interlaminar stress  
. photostresses  
. plane stress  
. residual stress  
. Reynolds stress  
. shear stress  
. . torsional stress  
. tensile stress  
. thermal stresses  
. triaxial stresses  
. vibrational stress

RT buckling  
cracks  
creep properties  
destruction  
fatigue (materials)  
∞ flight stress  
impact  
loads (forces)  
mechanical properties  
microyield strength  
prestressing  
rolling contact loads  
shear properties  
stress analysis  
stress concentration  
stress cycles  
stress relaxation  
stress waves  
structural strain  
temperature inversions  
transverse loads  
triboluminescence  
x ray stress analysis  
yield strength

### stress-strain diagrams

GS diagrams  
. **stress-strain diagrams**  
RT axial strain  
Hookes law  
inelastic stress  
modulus of elasticity  
Poisson ratio  
Portevin-le Chatelier effect  
proportional limit  
shape memory alloys  
shear properties  
strain measurement  
structural strain  
yield strength

### stress-strain relationships

DEF Relationship between the stress or load on a structure, structural member, or a specimen, and the strain or deformation that follows.

RT elastic deformation  
interlaminar stress  
plane strain  
plastic deformation  
Portevin-le Chatelier effect  
∞ relationships

residual stress  
strain distribution  
strain measurement  
stress concentration  
stress distribution  
structural strain  
yield strength

### stress-strain-time relations

RT creep diagrams  
Newtonian fluids  
thermoviscoelasticity

### stretch forming

RT bulging  
cold working  
∞ drawing  
metal drawing  
metal working  
stretching

### stretchers

GS medical equipment  
. **stretchers**  
RT first aid

### stretching

UF *dilatation*  
RT cold working  
deep drawing  
dilatational waves  
distortion  
∞ drawing  
ductility  
elastic deformation  
elongation  
metal working  
plastic deformation  
stretch forming  
tempering  
∞ tension  
winding

### striated muscle

(added December 2004)  
USE **skeletal muscle**

### striation

DEF A fracture surface marking consisting of a separation of the advancing crack front into separate fracture planes.

RT grooving  
musculoskeletal system  
riblets  
shatter cones  
skeletal muscle

### string theory

SN (DOES NOT INCLUDE CLASSICAL STRING THEORY)  
UF *superstring theory*  
RT bosons  
cosmology  
field theory (physics)  
gauge theory  
grand unified theory  
gravitation theory  
large-scale structure of the universe  
particle theory  
quantum chromodynamics  
quantum theory  
relativity  
supersymmetry  
theoretical physics  
unified field theory

### stringers

DEF Slender, lightweight, lengthwise fill-in structural members in a rocket body, or the like, serving to reinforce and give shape to the skin.

GS structural members  
. **stringers**  
RT longerons  
reinforcement (structures)  
structural stability

### strings

RT assemblies

cordage

### ∞ strip

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT airports  
circuits  
display devices  
metal strips  
ribbons  
runways

### strip mining

GS mining  
. **strip mining**  
RT clays  
coal  
Earth resources  
excavation  
exploitation  
lunar mining  
mineral deposits  
mines (excavations)  
soils

### strip transmission lines

GS transmission lines  
. **strip transmission lines**  
. . . microstrip transmission lines  
RT antenna feeds  
metal strips  
transmission circuits

### ∞ stripping

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT anodic stripping  
ion stripping  
paint removal  
peeling  
stripping (distillation)

### stripping (distillation)

GS distillation  
. **stripping (distillation)**  
RT ∞ separation  
∞ stripping  
vaporizing

### stroboscopes

GS optical equipment  
. **stroboscopes**  
RT ballistic cameras  
high speed cameras  
optical measurement  
synchronism  
time measurement  
velocity measurement

### stroke volume

(added March 1991)  
GS output  
. cardiac output  
. . . **stroke volume**  
RT blood volume  
cardiovascular system  
heart function  
heart rate  
physiological tests

### ∞ strokes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT cerebral vascular accidents  
thermodynamic cycles

### stroking tests

GS vibration tests  
. damping tests  
. . . **stroking tests**  
RT dynamic response  
frequency response  
modal response  
shock spectra  
structural vibration  
∞ tests  
transient response

wave excitation

**strong interactions (field theory)**

DEF One of the fundamental interactions of elementary particles, primarily responsible for nuclear forces and other interactions among hadrons.

GS particle interactions  
 . elementary particle interactions  
 . high energy interactions  
 . . . **strong interactions (field theory)**

RT field theory (physics)  
 grand unified theory  
 ∞ interactions  
 nuclear interactions  
 nuclear reactions  
 quantum chromodynamics  
 standard model (particle physics)  
 ∞ theories  
 weak interactions (field theory)

**strongly coupled plasmas**

DEF Highly compressed and collisional plasmas with electron densities of order 10 to the 24th power per cubic centimeter or more. The mean kinetic and potential energies of particles in the plasma are typically of the same order of magnitude.

GS particles  
 . charged particles  
 . energetic particles  
 . . . plasmas (physics)  
 . . . . collisional plasmas  
 . . . . **strongly coupled plasmas**  
 . . . . dense plasmas  
 . . . . **strongly coupled plasmas**  
 . corpuscular radiation  
 . energetic particles  
 . . . plasmas (physics)  
 . . . . collisional plasmas  
 . . . . **strongly coupled plasmas**  
 . . . . dense plasmas  
 . . . . **strongly coupled plasmas**

RT controlled fusion  
 cosmic plasma  
 coupled modes  
 dusty plasmas  
 high temperature plasmas  
 inertial confinement fusion  
 magnetohydrodynamic stability  
 plasma compression  
 plasma conductivity  
 plasma density  
 plasma equilibrium  
 plasma focus

**strontium**

GS chemical elements  
 . **strontium**  
 . . strontium isotopes  
 . . . strontium 85  
 . . . strontium 87  
 . . . strontium 89  
 . . . strontium 90  
 metals  
 . **strontium**  
 . . strontium isotopes  
 . . . strontium 85  
 . . . strontium 87  
 . . . strontium 89  
 . . . strontium 90

**strontium 85**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . radioactive isotopes  
 . . . . **strontium 85**  
 . . . . strontium isotopes  
 . . . . **strontium 85**  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 85**  
 metals  
 . strontium  
 . . strontium isotopes

. . . **strontium 85**

**strontium 87**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . strontium isotopes  
 . . . . **strontium 87**  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 87**  
 metals  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 87**

**strontium 88**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . radioactive isotopes  
 . . . . **strontium 88**

**strontium 89**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . radioactive isotopes  
 . . . . **strontium 89**  
 . . . strontium isotopes  
 . . . . **strontium 89**  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 89**  
 metals  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 89**

**strontium 90**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . radioactive isotopes  
 . . . . **strontium 90**  
 . . . strontium isotopes  
 . . . . **strontium 90**  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 90**  
 metals  
 . strontium  
 . . strontium isotopes  
 . . . **strontium 90**

**strontium bromides**

GS halogen compounds  
 . bromine compounds  
 . bromides  
 . . . **strontium bromides**  
 . halides  
 . bromides  
 . . . **strontium bromides**  
 . . . metal halides  
 . . . **strontium bromides**  
 strontium compounds  
 . **strontium bromides**

**strontium compounds**

GS **strontium compounds**  
 . strontium bromides  
 . strontium fluorides  
 . strontium oxides  
 . strontium sulfides  
 . strontium titanates  
 . strontium zirconates  
 RT ∞ alkaline earth compounds  
 ∞ chemical compounds  
 ∞ metal compounds

**strontium fluorides**

GS halogen compounds  
 . fluorine compounds  
 . fluorides  
 . . . metal fluorides  
 . . . . **strontium fluorides**  
 . halides  
 . fluorides  
 . . . metal fluorides  
 . . . . **strontium fluorides**

. . metal halides  
 . . . metal fluorides  
 . . . . **strontium fluorides**  
 strontium compounds  
 . **strontium fluorides**

**strontium isotopes**

GS chemical elements  
 . nuclides  
 . isotopes  
 . . . **strontium isotopes**  
 . . . . strontium 85  
 . . . . strontium 87  
 . . . . strontium 89  
 . . . . strontium 90  
 . strontium  
 . . **strontium isotopes**  
 . . . strontium 85  
 . . . strontium 87  
 . . . strontium 89  
 . . . strontium 90  
 metals  
 . strontium  
 . . **strontium isotopes**  
 . . . strontium 85  
 . . . strontium 87  
 . . . strontium 89  
 . . . strontium 90

**strontium oxides**

(added June 1992)  
 GS chalcogenides  
 . oxides  
 . metal oxides  
 . . **strontium oxides**  
 strontium compounds  
 . **strontium oxides**  
 RT ∞ alkaline earth compounds  
 BSCCO superconductors  
 ∞ chemical compounds  
 high temperature superconductors  
 ∞ metal compounds  
 mixed oxides  
 superconductors (materials)

**strontium sulfides**

GS chalcogenides  
 . sulfides  
 . inorganic sulfides  
 . . . **strontium sulfides**  
 strontium compounds  
 . **strontium sulfides**  
 sulfur compounds  
 . sulfides  
 . inorganic sulfides  
 . . . **strontium sulfides**

**strontium titanates**

GS strontium compounds  
 . **strontium titanates**  
 titanium compounds  
 . titanates  
 . . **strontium titanates**

**strontium zirconates**

GS strontium compounds  
 . **strontium zirconates**  
 zirconium compounds  
 . zirconates  
 . . **strontium zirconates**

**Strouhal number**

DEF A nondimensional number occurring in the study of periodic or quasiperiodic variations in the wake of objects immersed in a fluid stream.

GS dimensionless numbers  
 . **Strouhal number**  
 ratios  
 . **Strouhal number**

RT backwash  
 buffeting  
 flow characteristics  
 flow distribution  
 flow stability  
 Froude number  
 oscillating flow  
 slipstreams  
 turbulence  
 unsteady flow

## structural analysis

vortices  
wakes

### structural analysis

UF *membrane analogy*  
*membrane theory*  
GS **structural analysis**  
. dynamic structural analysis  
. . flutter analysis  
. energy methods  
. . Bernstein energy principle  
. . strain energy methods  
. equilibrium methods  
. matrix methods  
RT ∞ analyzing  
Castigliano variational theorem  
computational mechanics  
construction  
continuum modeling  
creep analysis  
design optimization  
Euler-Bernoulli beams  
hole geometry (mechanics)  
influence coefficient  
J integral  
loading moments  
megamechanics  
Michell theorem  
Mindlin plates  
modular ratios  
moment distribution  
NASTRAN  
orbital space tests  
patch tests  
plate theory  
shape functions  
shape optimization  
solid mechanics  
stiffness matrix  
stress analysis  
Trefftz method

### structural basins

UF *basins*  
*closed basins*  
*depressions (topography)*  
*sinks (geology)*  
GS landforms  
. **structural basins**  
. . cirques (landforms)  
. . Great Basin (US)  
. . Kalahari Basin (Africa)  
. . karst  
. . . sinkholes  
. . kettles (geology)  
. . Lake Champlain Basin (NY-VT)  
. . river basins  
. . . Atchafalaya River Basin (LA)  
. . . Chena River Basin (AK)  
. . . Columbia River Basin (ID-OR-WA)  
. . . Delaware River Basin (US)  
. . . Feather River Basin (CA)  
. . . Missouri River Basin (US)  
. . . Susquehanna River Basin (MD-NY-PA)  
. . . Wabash River Basin (IL-IN-OH)  
. . . wadis  
. . watersheds  
. . Williston Basin (North America)  
RT geology  
seamounts  
valleys

### structural beams

USE **beams (supports)**

### structural design

GS **structural design**  
. pressure vessel design  
RT aeroelastic research wings  
aircraft design  
airframe materials  
architecture  
breakwaters  
computer aided design  
construction  
∞ design  
design optimization  
helicopter design

lofting  
materials selection  
missile design  
plant design  
product development  
satellite design  
shape optimization  
ship hulls  
shock spectra  
space station structures  
spacecraft design  
spacecraft structures  
stress analysis  
stress tensors  
substructures  
tensegrity structures  
underwater structures  
weight reduction

### structural design criteria

GS criteria  
. **structural design criteria**  
RT aerodynamic loads  
axial compression loads  
axial loads  
bending moments  
compression loads  
cyclic loads  
∞ design  
design optimization  
dynamic loads  
geotechnical engineering  
gust loads  
impact loads  
landing loads  
loads (forces)  
mass distribution  
moment distribution  
pressure distribution  
random loads  
rolling contact loads  
shape optimization  
shock loads  
static loads  
thrust loads  
transient loads  
vibratory loads

### structural dynamics

USE **dynamic structural analysis**

### structural engineering

RT aeronautical engineering  
aerospace engineering  
construction  
∞ engineering  
geotechnical engineering  
megamechanics  
modular ratios  
smart structures  
stress analysis  
structural health monitoring

### structural failure

GS failure  
. **structural failure**  
RT bending  
buckling  
collapse  
cracking (fracturing)  
creep properties  
deformation  
fatigue (materials)  
fracturing  
load carrying capacity  
mechanical properties  
structural health monitoring  
system failures

### structural fatigue

USE **fatigue (materials)**

### structural foundations

USE **foundations**

### structural health monitoring

(added February 2009)  
DEF Strategy for the on-going assessment of structural integrity applied to aerospace, civil, and mechanical engineering structures; typically

implemented by periodically analyzing damage-sensitive features in dynamic response measurements.

RT damage assessment  
fault detection  
nondestructive tests  
smart structures  
structural engineering  
structural failure  
structural reliability  
systems health monitoring

### structural influence coefficients

UF *SIC (coefficient)*  
GS coefficients  
. influence coefficient  
. . **structural influence coefficients**

### structural materials

USE **construction materials**

### structural members

GS **structural members**  
. beams (supports)  
. . box beams  
. . cantilever beams  
. . curved beams  
. . Euler-Bernoulli beams  
. . I beams  
. . rectangular beams  
. . Timoshenko beams  
. columns (supports)  
. . tapered columns  
. girders  
. longerons  
. membrane structures  
. . skin (structural member)  
. plates (structural members)  
. . anisotropic plates  
. . annular plates  
. . cantilever plates  
. . circular plates  
. . corrugated plates  
. . elastic plates  
. . end plates  
. . flat plates  
. . girder webs  
. . metal plates  
. . . boiler plate  
. . Mindlin plates  
. . orthotropic plates  
. . perforated plates  
. . plastic plates  
. . porous plates  
. . rectangular plates  
. . reinforced plates  
. . thick plates  
. . thin plates  
. saddles (supports)  
. strakes  
. stringers  
. struts  
. trusses  
. wing panels  
RT aircraft construction materials  
airframe materials  
bars  
∞ channels  
clamped structures  
∞ components  
concretes  
construction  
∞ construction materials  
fasteners  
foundations  
guy wires  
joints (junctions)  
masonry  
pylon mounting  
pylons  
rectangular panels  
reinforcement (structures)  
rods  
slabs  
smart structures  
stiffness matrix  
∞ structures  
substructures

- thick walls
- structural properties (geology)**  
 UF *lineament*  
 GS geology  
 . **structural properties (geology)**  
 RT Earth core  
 Earth crust  
 Earth mantle  
 Earth planetary structure  
 Earth surface  
 fissures (geology)  
 geophysics  
 Great Basin (US)  
 hydrology  
 inliers (landforms)  
 landforms  
 neotectonics  
 planetary composition  
 plates (tectonics)  
 ∞ properties  
 rock mechanics  
 shatter cones  
 sinkholes  
 subduction (geology)
- structural reliability**  
 GS reliability  
 . **structural reliability**  
 RT aircraft reliability  
 component reliability  
 cumulative damage  
 quality control  
 structural health monitoring
- structural rigidity*  
 USE **structural stability**
- structural stability**  
 UF *structural rigidity*  
 GS mechanical properties  
 . dimensional stability  
 . . **structural stability**  
 . . . shell stability  
 stability  
 . static stability  
 . . dimensional stability  
 . . . **structural stability**  
 . . . . shell stability  
 RT aircraft stability  
 aspect ratio  
 combustion vibration  
 hybrid structures  
 load carrying capacity  
 longerons  
 plastic properties  
 reinforcement (structures)  
 resonance testing  
 ∞ rigidity  
 rotor stator interactions  
 stiffness  
 stringers  
 wave resistance
- structural strain**  
 RT axial strain  
 bending  
 buckling  
 cracking (fracturing)  
 deflection  
 deformation  
 elastic deformation  
 failure  
 load carrying capacity  
 moments of inertia  
 plastic deformation  
 prestressing  
 reinforcement (structures)  
 rupturing  
 shear strain  
 shearing  
 strain measurement  
 stress concentration  
 stresses  
 stress-strain diagrams  
 stress-strain relationships  
 system failures  
 temperature inversions  
 twisting  
 volumetric strain
- warpage
- structural vibration**  
 GS vibration  
 . **structural vibration**  
 . . bending vibration  
 . . breathing vibration  
 . . flutter  
 . . . panel flutter  
 . . . subsonic flutter  
 . . . supersonic flutter  
 . . . transonic flutter  
 . . linear vibration  
 . . missile vibration  
 . . self induced vibration  
 . . . panel flutter  
 . . . subsonic flutter  
 . . . supersonic flutter  
 . . . transonic flutter  
 . . torsional vibration  
 RT airfoil oscillations  
 clamped structures  
 earthquake resistant structures  
 flexible spacecraft  
 flutter analysis  
 gyrodampers  
 Mindlin plates  
 random vibration  
 resonant vibration  
 rotor dynamics  
 shaking  
 shock spectra  
 stroking tests  
 vibration tests
- structural weight**  
 GS weight (mass)  
 . **structural weight**  
 RT mass ratios  
 materials selection  
 NEW MOONS project  
 weight analysis  
 weight reduction
- structured grids (mathematics)**  
*(added May 1995)*  
 DEF In computational fluid dynamics, grid systems where the flowfield is discretized into quadrilateral elements for two-dimensional fields, and hexahedral elements for three-dimensional fields. In this type of grid system the grid points can be associated with grid lines in an ordered manner.  
 GS coordinates  
 . computational grids  
 . . **structured grids (mathematics)**  
 . . . multiblock grids  
 RT computational fluid dynamics  
 grid generation (mathematics)  
 ∞ nets  
 smoothing  
 unstructured grids (mathematics)
- structured programming**  
*(added December 1989)*  
 GS computer programming  
 . **structured programming**  
 RT computer aided design  
 computer programs  
 data structures  
 ∞ programming  
 programming languages  
 software engineering
- ∞ **structures**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT aircraft structures  
 architecture  
 atomic structure  
 breakwaters  
 bridges (structures)  
 clamped structures  
 composite structures  
 concrete structures  
 configuration interaction  
 crystal structure  
 Earth planetary structure  
 earthquake resistant structures
- expandable structures  
 fine structure  
 folding structures  
 foundations  
 frames  
 galactic structure  
 honeycomb structures  
 hulls (structures)  
 hybrid structures  
 hyperfine structure  
 inflatable structures  
 intramolecular structures  
 isotensoid structures  
 large space structures  
 membrane structures  
 microstructure  
 missile structures  
 molecular structure  
 monocoque structures  
 planar structures  
 redundant components  
 rigid structures  
 ring structures  
 sandwich structures  
 smart structures  
 space erectable structures  
 space station structures  
 spacecraft structures  
 steel structures  
 stellar structure  
 stressed-skin structures  
 structural members  
 substructures  
 tanks (containers)  
 tensegrity structures  
 towers  
 trusses  
 unimolecular structures  
 variable geometry structures  
 welded structures  
 wooden structures
- struts**  
 GS structural members  
 . **struts**  
 RT chassis  
 columns (supports)  
 frames  
 pylons  
 supports  
 trusses
- strychnine**  
 GS bases (chemical)  
 . alkaloids  
 . . **strychnine**  
 nitrogen compounds  
 . alkaloids  
 . . **strychnine**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . alkaloids  
 . . . . **strychnine**  
 poisons  
 . **strychnine**  
 stimulants  
 RT
- STS  
 USE **space transportation system**
- STS-1  
 USE **Space Transportation System 1 flight**
- STS-2  
 USE **Space Transportation System 2 flight**
- STS-3  
 USE **Space Transportation System 3 flight**
- STS-4  
 USE **Space Transportation System 4 flight**
- students**  
 UF *trainees*  
 RT education



## studs (structural members)

instructors  
learning  
training evaluation  
universities

*studies*

USE **investigation**

### studs (structural members)

RT anchors (fasteners)  
bolts  
columns (supports)  
fasteners  
holders  
lugs  
pins  
screws  
walls

*stunt flying*

USE **aerobatics**

*Sturm-Liouville operator*

USE **Sturm-Liouville theory**

### Sturm-Liouville theory

UF *Sturm-Liouville operator*  
GS analysis (mathematics)  
. real variables  
. . **Sturm-Liouville theory**  
RT differential equations  
Lamb waves  
Lame wave equations  
∞ theories

*styluses*

USE **pens**

### styphnates

GS explosives  
. **styphnates**  
RT ∞ chemical compounds  
∞ initiators  
initiators (explosives)

### styrenes

GS **styrenes**  
. polystyrene  
. . styrofoam (trademark)  
RT Buna (trademark)

### styrofoam (trademark)

GS plastics  
. polystyrene  
. . **styrofoam (trademark)**  
styrenes  
. polystyrene  
. . **styrofoam (trademark)**  
vinyl polymers  
. polystyrene  
. . **styrofoam (trademark)**  
RT foams  
∞ polymers

### subarctic regions

GS Northern Hemisphere  
. Arctic regions  
. . **subarctic regions**  
regions  
. polar regions  
. . Arctic regions  
. . . **subarctic regions**  
. remote regions  
. . Arctic regions  
. . . **subarctic regions**

### subassemblies

DEF Assemblies that are component parts of larger assemblies. Used for subcircuits.  
GS assemblies  
. **subassemblies**  
RT accessories  
∞ components

### subaudible frequencies

GS frequencies  
. **subaudible frequencies**  
range (extremes)  
. frequency ranges  
. . **subaudible frequencies**  
RT acoustic frequencies

frequency distribution  
harmonics  
zero sound

*subcarrier waves*

USE **carrier waves**

*subcircuits*

USE **circuits**

### subcontracts

DEF Any contracts, other than prime contracts, entered into by a prime contractor or subcontractor calling for supplies or services required for the performance of any one or more prime contracts.

GS contracts  
. **subcontracts**

RT agreements  
contract management  
contract negotiation  
contractors  
estimates  
grants  
options  
procurement

### subcritical flow

DEF Open channel flow having a low velocity and a Froude number less than unity (also described as tranquil or streaming flow).

GS fluid flow  
. **subcritical flow**

RT critical flow  
flow characteristics  
gas flow  
liquid flow  
multiphase flow  
orifice flow  
pipe flow  
pressure gradients  
single-phase flow  
steady flow  
steam flow  
supercritical flow  
turbulent flow  
uniform flow  
unsteady flow

### subcritical mass

GS mass  
. **subcritical mass**  
RT critical mass  
nuclear fission  
nuclear reactions

### subdivisions

RT ∞ division  
∞ groups  
∞ sections  
set theory  
subgroups  
subsidiaries

### subduction (geology)

DEF Descent of one tectonic unit under another. Most commonly used for descent of a slab of lithosphere, but appropriate at any scale.

GS geology  
. **subduction (geology)**

RT Earth mantle  
earthquakes  
lithosphere  
neotectonics  
plates (tectonics)  
seismology  
structural properties (geology)  
tectonics

### subdwarf stars

GS celestial bodies  
. stars  
. . **subdwarf stars**  
RT dwarf stars  
main sequence stars  
red dwarf stars  
white dwarf stars

### subgiant stars

DEF Celestial bodies whose position on the

Hertzsprung-Russell (H-R) diagram is intermediate between that of the main-sequence stars and normal giants of the same spectral type.

GS celestial bodies  
. stars  
. . **subgiant stars**

RT carbon stars  
dwarf stars  
giant stars  
late stars  
M stars  
main sequence stars  
stellar evolution  
supergiant stars

*subgravity*

USE **microgravity**

### subgroups

UF *sublattices*  
GS algebra  
. group theory  
. . homomorphisms  
. . . **subgroups**  
RT matrices (mathematics)  
number theory  
probability theory  
set theory  
subdivisions  
subsidiaries

### subharmonic generators

RT damping  
∞ generators  
harmonic generators  
harmonic oscillators  
harmonics  
oscillators  
signal generators  
stimulated emission devices

*SUBIC project*

USE **Submarine Integrated Control project**

### subjects

GS classifications  
. **subjects**  
RT handbooks  
information retrieval  
textbooks

*sublattices*

USE **lattices (mathematics) subgroups**

*sublayers*

USE **substrates**

### sublethal dosage

GS dosage  
. **sublethal dosage**  
RT drugs

### sublimation

DEF The transition of a substance directly from the solid state to the vapor state, or vice versa, without passing through the intermediate liquid state.

GS phase transformations  
. vaporizing  
. . **sublimation**  
RT ablation  
beneficiation  
condensing  
crystallization  
desorption  
diffusion  
evaporation  
gas-metal interactions  
gas-solid interfaces  
phase change materials  
purification  
pyrometallurgy  
refining  
∞ separation  
vapor pressure

### subliminal stimuli

RT psychology

sensory stimulation  
 ∞ stimuli

**submarine cables**  
 GS transmission lines  
 . **submarine cables**  
 RT ∞ cables  
 coaxial cables  
 communication cables  
 power lines

**submarine hydrothermal vents**  
*(added March 2005)*  
 UF *black smokers (oceanography)*  
*deep-sea hydrothermal vents*  
*seafloor hydrothermal vents*  
*white smokers (oceanography)*  
 RT crystallization  
 deep water  
 geochemistry  
 hydrothermal systems  
 mid-ocean ridges  
 mineralogy  
 ocean bottom  
 oceanography  
 sea floor spreading  
 volcanic eruptions

**Submarine Integrated Control project**  
 UF *SUBIC project*  
 GS programs  
 . projects  
 . . **Submarine Integrated Control project**  
 RT ∞ control

**submarine propulsion**  
 GS propulsion  
 . marine propulsion  
 . . underwater propulsion  
 . . . **submarine propulsion**

**submarines**  
 DEF Any self-powered underwater craft or towed underwater barges and arrays.  
 GS water vehicles  
 . ships  
 . . **submarines**  
 . . . ballistic missile submarines  
 . . . guided missile submarines  
 . . . trident submarine  
 . underwater vehicles  
 . . **submarines**  
 . . . ballistic missile submarines  
 . . . guided missile submarines  
 . . . trident submarine  
 RT antiship missiles  
 antiship warfare  
 antisubmarine warfare  
 ∞ military vehicles  
 navy  
 nuclear powered ships  
 Seafarer project  
 ship hulls  
 submerged bodies

**submerged bodies**  
 GS **submerged bodies**  
 . diving (underwater)  
 . underwater research laboratories  
 RT submarines  
 torpedoes  
 towed bodies  
 underwater engineering  
 underwater photography  
 underwater structures  
 underwater vehicles  
 water immersion

**submerging**  
 UF *immersion*  
 RT baths  
 dipping  
 quenching (cooling)  
 sinking  
 ∞ soaking  
 water immersion  
 weightlessness simulation

wetting

**submersible aircraft**  
 RT ∞ aircraft  
 antisubmarine warfare aircraft  
 light aircraft  
 ∞ military aircraft  
 reconnaissance aircraft  
 research aircraft  
 water takeoff and landing aircraft

**Submillimeter Wave Astronomy Satellite**  
*(added November 2000)*  
 DEF A NASA Small Explorer Project (SMEX) satellite designed to study the chemical composition, energy balance, and structure of interstellar gas clouds and the processes that lead to the formation of stars and planets. Its primary objective is to survey water, molecular oxygen, carbon, and isotopic carbon monoxide emission in a variety of galactic star forming regions.  
 UF *Explorer 74 satellite*  
*SWAS (satellite)*  
 GS artificial satellites  
 . scientific satellites  
 . . astronomical satellites  
 . . . **Submillimeter Wave Astronomy Satellite**  
 . . . Explorer satellites  
 . . . **Submillimeter Wave Astronomy Satellite**  
 . . small scientific satellites  
 . . . **Submillimeter Wave Astronomy Satellite**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . **Submillimeter Wave Astronomy Satellite**  
 RT interstellar chemistry  
 interstellar matter  
 molecular clouds  
 spaceborne astronomy  
 star formation  
 submillimeter waves

**submillimeter waves**  
 SN (BELOW 1 MILLIMETER)  
 GS electromagnetic radiation  
 . radio waves  
 . . short wave radiation  
 . . . **submillimeter waves**  
 RT beams (radiation)  
 electromagnetic noise  
 far infrared radiation  
 frequencies  
 Large Deployable Reflector  
 microwaves  
 millimeter waves  
 Submillimeter Wave Astronomy Satellite  
 wavelengths

**subminiaturization**  
 GS miniaturization  
 . **subminiaturization**  
 RT electronic modules  
 microminiaturization  
 miniature electronic equipment  
 printed circuits

**suborbital flight**  
 RT ∞ flight  
 manned space flight  
 orbits  
 parabolic flight  
 rocket flight  
 space flight  
 weightlessness

**subreflectors**  
 RT Cassegrain antennas  
 conductors  
 reflector antennas  
 reflectors  
 scanners

**Subroc missile**  
 GS missiles

. ballistic missiles  
 . . **Subroc missile**  
 . surface to surface missiles  
 . . fleet ballistic missiles  
 . . . **Subroc missile**  
 . underwater to surface missiles  
 . . **Subroc missile**  
 RT underwater trajectories

**subroutine libraries (computers)**  
 GS computer programs  
 . computer systems programs  
 . . **subroutine libraries (computers)**  
 RT subroutines

**subroutines**  
 DEF A set of instructions necessary to direct a computer to carry out a well defined mathematical or logical operation; a subunit of a routine, usually coded in such a manner that it can be treated as a black box by the routine using it.  
 GS computer programs  
 . **subroutines**  
 data conversion routines  
 . **subroutines**  
 RT compilers  
 parsing algorithms  
 subroutine libraries (computers)  
 user manuals (computer programs)

*subsets (mathematics)*  
 USE **set theory**

**subsidence**  
 RT isostasy  
 mines (excavations)  
 settling

**subsidiaries**  
 RT ∞ division  
 ∞ sections  
 subdivisions  
 subgroups

∞ **subsonic aircraft**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT ∞ aircraft  
 flying platforms  
 general aviation aircraft  
 GETOL aircraft  
 gliders  
 ground effect machines  
 helicopters  
 jet aircraft  
 light aircraft  
 paragliders  
 passenger aircraft  
 rotary wing aircraft  
 short takeoff aircraft  
 supersonic aircraft  
 tandem wing aircraft  
 training aircraft  
 transport aircraft  
 turboprop aircraft  
 utility aircraft  
 vertical takeoff aircraft  
 water takeoff and landing aircraft

**subsonic flow**  
 DEF Flow of a fluid, as air over an airfoil, at speeds less than acoustic velocity.  
 GS fluid flow  
 . **subsonic flow**  
 RT aerodynamics  
 compressible flow  
 flow velocity  
 gas flow  
 incompressible flow  
 Karman vortex street  
 Ringleb flow  
 transonic flow

**subsonic flutter**  
 GS vibration  
 . structural vibration  
 . . flutter  
 . . . **subsonic flutter**  
 . . self induced vibration

## subsonic speed

. . . **subsonic flutter**  
RT transonic flutter

### subsonic speed

SN (LESS THAN MACH 1)  
GS rates (per time)  
. **subsonic speed**  
velocity  
. **subsonic speed**  
RT acoustic velocity  
low speed  
transonic speed

### subsonic wind tunnels

GS test facilities  
. wind tunnels  
. . . low speed wind tunnels  
. . . **subsonic wind tunnels**  
RT blowdown wind tunnels  
hypersonic wind tunnels  
rectangular wind tunnels  
supersonic wind tunnels  
transonic wind tunnels

### substances

USE **materials**

### substitutes

UF *substitution*  
RT alternatives  
replacing  
variations

### substitution

USE **substitutes**

### substrates

UF *sublayers*  
GS strata  
. **substrates**  
RT coatings  
laminates  
∞ layers  
metallizing  
photomasks  
plating  
ply orientation  
primers (coatings)

### substructures

RT floors  
foundations  
structural design  
structural members  
∞ structures  
supports  
undercarriages  
walls

### subtraction

GS number theory  
. **subtraction**  
RT arithmetic  
computation  
Gaussian elimination

### subtropical regions

USE **temperate regions**  
**tropical regions**

### suburban areas

RT cities  
land use  
megalopolises  
regional planning  
residential areas  
rural areas

### subzero temperature

GS temperature  
. **subzero temperature**  
RT absolute zero  
atmospheric temperature  
cold acclimatization  
cold tolerance  
cold weather

### Success project

GS programs  
. projects  
. . . **Success project**

weapon systems  
. **Success project**

### succinimides

GS nitrogen compounds  
. amides  
. . . **succinimides**  
. imides  
. . . **succinimides**

### succinonitrile

(added April 2004)

DEF A four-carbon straight chain dinitrile compound. A transparent, organic material with structure and growth characteristics similar to metals and alloys.

UF *butanedinitrile*  
*ethylene cyanide*  
GS cyanides  
. **succinonitrile**  
nitrogen compounds  
. nitriles  
. . . **succinonitrile**  
organic compounds  
. ethylene compounds  
. . . **succinonitrile**  
. nitriles  
. . . **succinonitrile**

### sucrose

GS organic compounds  
. carbohydrates  
. . . sugars  
. . . **sucrose**

### suction

RT evacuating (vacuum)  
pressure effects  
pressure gradients  
vacuum  
vacuum apparatus  
vacuum pumps

### Sud Aviation aircraft

GS **Sud Aviation aircraft**  
. Alouette helicopters  
. . . SA-330 helicopter  
. . . SE-3160 helicopter  
. Concorde aircraft  
. SA-321 helicopter  
. SE-210 aircraft  
RT ∞ aircraft

### Sud Aviation SA-321 helicopter

USE **SA-321 helicopter**

### Sud Aviation SA-330 helicopter

USE **SA-330 helicopter**

### Sud Aviation SE-210 aircraft

USE **SE-210 aircraft**

### Sud Aviation SE-3160 helicopter

USE **SE-3160 helicopter**

### Sudan

GS nations  
. **Sudan**  
RT Africa

### sudden enhancement of atmospheric

GS electromagnetic interference  
. radio frequency interference  
. . . electromagnetic noise  
. . . . atmospheric  
. . . . **sudden enhancement of atmospheric**

### sudden ionospheric disturbances

DEF Complex combinations of sudden changes in the conditions of the ionosphere and the effects of these changes. Used for geomagnetic crotchets and SID (ionospheric disturbances).

UF *geomagnetic crotchets*  
*SID (ionospheric disturbances)*  
GS ionospheric disturbances

. ionospheric storms  
. . . **sudden ionospheric disturbances**  
storms

. ionospheric storms  
. . . **sudden ionospheric disturbances**

RT ∞ disturbances  
magnetic disturbances  
magnetic storms  
solar activity effects  
traveling ionospheric disturbances

### sudden storm commencements

RT magnetic disturbances  
magnetic storms  
solar activity effects  
solar corpuscular radiation  
solar flares  
storms

### sugar beets

GS farm crops  
. **sugar beets**  
plants (botany)  
. **sugar beets**  
RT agriculture  
botany  
crop growth  
crop vigor  
Earth resources  
farmlands  
irrigation  
seeds  
sugars

### sugar cane

GS farm crops  
. **sugar cane**  
plants (botany)  
. **sugar cane**  
RT agriculture  
botany  
crop growth  
crop vigor  
Earth resources  
farmlands  
∞ food  
irrigation  
seeds

### sugars

GS organic compounds  
. carbohydrates  
. . . **sugars**  
. . . . dextrans  
. . . . inositols  
. . . . lactose  
. . . . mannitol  
. . . . monosaccharides  
. . . . sucrose  
. . . . . hexoses  
. . . . . galactose  
. . . . . glucose  
. . . . . pentose  
. . . . . ribose  
. . . . . xylose  
RT ∞ food  
sugar beets

### suggestion

GS recommendations  
. **suggestion**  
RT hypnosis

### Suhl effect

RT carrier injection  
∞ effects  
electrons  
excitons  
holes (electron deficiencies)  
magnetic fields  
n-type semiconductors  
recombination reactions

### suitability

RT acceptability  
compatibility

### suits

GS clothing  
. **suits**  
. . . pressure suits  
. . . . space suits

... extravehicular mobility units  
 RT garments

**Sukhoi aircraft**  
 (added September 1995)  
 RT ∞ aircraft

**sulfates**

GS sulfur compounds  
 . **sulfates**  
 . . alum  
 . . ammonium sulfates  
 . . barite  
 . . hydroxylamine sulfate  
 . . lithium sulfates  
 . . magnesium sulfates  
 . . hexahedrite  
 . . sodium sulfates  
 RT gypsum  
 sulfuric acid

**sulfation**

DEF The introduction into an organic molecule of the sulfuric ester group (or its salts) -O-SO<sub>3</sub>H, where the sulfur is linked through an oxygen atom to the parent molecule.  
 GS chemical reactions  
 . **sulfation**  
 RT hydrometallurgy  
 sulfidation

**sulfidation**

DEF The reaction of a metal or alloy with a sulfur-containing species to produce a sulfur compound that forms on or beneath the surface of the metal or alloy.  
 GS chemical reactions  
 . **sulfidation**  
 RT corrosion resistance  
 gas-metal interactions  
 heat resistant alloys  
 nickel alloys  
 sulfation  
 sulfides

**sulfides**

GS chalcogenides  
 . **sulfides**  
 . . disulfides  
 . . . carbon disulfide  
 . . inorganic sulfides  
 . . . barium sulfides  
 . . . bismuth sulfides  
 . . . cadmium sulfides  
 . . . calcium sulfides  
 . . . copper sulfides  
 . . . hydrogen sulfide  
 . . . indium sulfides  
 . . . lead sulfides  
 . . . molybdenum sulfides  
 . . . . molybdenum disulfides  
 . . . polysulfides  
 . . . strontium sulfides  
 . . . zinc sulfides  
 . . . . wurtzite  
 . . . . zinctblende  
 . . pyrites  
 . . pyrrhotite  
 . . troilite  
 sulfur compounds  
 . **sulfides**  
 . . disulfides  
 . . . carbon disulfide  
 . . inorganic sulfides  
 . . . barium sulfides  
 . . . bismuth sulfides  
 . . . cadmium sulfides  
 . . . calcium sulfides  
 . . . copper sulfides  
 . . . hydrogen sulfide  
 . . . indium sulfides  
 . . . lead sulfides  
 . . . molybdenum sulfides  
 . . . . molybdenum disulfides  
 . . . polysulfides  
 . . . strontium sulfides  
 . . . zinc sulfides  
 . . . . wurtzite  
 . . . . zinctblende  
 . . pyrites

... pyrrhotite  
 ... troilite  
 RT sulfidation  
 thioplastics

**sulfites**

GS sulfur compounds  
 . **sulfites**  
 . . hydrosulfites  
 . . sodium sulfites

**sulfonates**

GS esters  
 . **sulfonates**  
 sulfur compounds  
 . **sulfonates**  
 RT ∞ salts

**sulfones**

GS sulfur compounds  
 . **sulfones**  
 RT sulfonic acid

**sulfonic acid**

GS acids  
 . **sulfonic acid**  
 RT sulfones  
 sulfur compounds

**sulfur**

GS chemical elements  
 . **sulfur**  
 . . sulfur isotopes

**sulfur chlorides**

GS halogen compounds  
 . chlorine compounds  
 . . chlorides  
 . . . **sulfur chlorides**  
 . . halides  
 . . . chlorides  
 . . . **sulfur chlorides**  
 sulfur compounds  
 . **sulfur chlorides**

**sulfur compounds**

GS **sulfur compounds**  
 . organic sulfur compounds  
 . sulfates  
 . . alum  
 . . ammonium sulfates  
 . . barite  
 . . hydroxylamine sulfate  
 . . lithium sulfates  
 . . magnesium sulfates  
 . . . hexahedrite  
 . . sodium sulfates  
 . sulfides  
 . . disulfides  
 . . . carbon disulfide  
 . . inorganic sulfides  
 . . . barium sulfides  
 . . . bismuth sulfides  
 . . . cadmium sulfides  
 . . . calcium sulfides  
 . . . copper sulfides  
 . . . hydrogen sulfide  
 . . . indium sulfides  
 . . . lead sulfides  
 . . . molybdenum sulfides  
 . . . . molybdenum disulfides  
 . . . polysulfides  
 . . . strontium sulfides  
 . . . zinc sulfides  
 . . . . wurtzite  
 . . . . zinctblende  
 . . pyrites  
 . . pyrrhotite  
 . . troilite  
 . sulfites  
 . . hydrosulfites  
 . . sodium sulfites  
 . sulfonates  
 . sulfones  
 . sulfur chlorides  
 . sulfur fluorides  
 . sulfur hexafluoride  
 . sulfur oxides  
 . sulfur dioxides  
 . sulfuric acid

. thiazine (trademark)  
 . thiols  
 . . cysteine  
 . . dimercaprol  
 RT bloodite  
 ∞ chemical compounds  
 ∞ Group 6A compounds  
 sulfonic acid

**sulfur dioxides**

GS chalcogenides  
 . oxides  
 . . dioxides  
 . . . **sulfur dioxides**  
 . . sulfur oxides  
 . . . **sulfur dioxides**  
 sulfur compounds  
 . sulfur oxides  
 . . **sulfur dioxides**

**sulfur fluorides**

GS halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . **sulfur fluorides**  
 . . . sulfur hexafluoride  
 . . halides  
 . . . fluorides  
 . . . **sulfur fluorides**  
 . . . sulfur hexafluoride  
 sulfur compounds  
 . **sulfur fluorides**  
 . . sulfur hexafluoride

**sulfur hexafluoride**

(added September 1993)  
 GS gases  
 . **sulfur hexafluoride**  
 halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . sulfur fluorides  
 . . . . **sulfur hexafluoride**  
 . . halides  
 . . . fluorides  
 . . . sulfur fluorides  
 . . . . **sulfur hexafluoride**  
 sulfur compounds  
 . sulfur fluorides  
 . . **sulfur hexafluoride**  
 RT ∞ chemical compounds  
 dielectrics  
 infrared spectroscopy  
 laser materials  
 working fluids

**sulfur isotopes**

GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **sulfur isotopes**  
 . sulfur  
 . . **sulfur isotopes**

**sulfur oxides**

GS chalcogenides  
 . oxides  
 . . **sulfur oxides**  
 . . . sulfur dioxides  
 sulfur compounds  
 . **sulfur oxides**  
 . . sulfur dioxides  
 RT acid rain  
 dioxides

**sulfuric acid**

GS acids  
 . **sulfuric acid**  
 sulfur compounds  
 . **sulfuric acid**  
 RT sulfates

**sum rules**

GS rules  
 . **sum rules**  
 RT sums

**summaries**

GS **summaries**  
 . abstracts

## summer

. prelaunch summaries  
RT annotations  
bibliographies  
documentation  
indexes (documentation)  
information dissemination  
postlaunch reports  
reports

**summer**  
GS seasons  
. **summer**  
RT autumn  
hot weather  
solstices  
spring (season)  
winter

**sumps**  
RT drainage  
pits (excavations)  
waste disposal

**sums**  
RT algebra  
amount  
arithmetic  
computation  
series (mathematics)  
sum rules

**sun**  
DEF The star at the center of the solar system, around which the planets, asteroids, and comets revolve. It is a G-type star. Used for solar disk.  
UF *solar disk*  
GS celestial bodies  
. stars  
. . . G stars  
. . . **sun**  
. . . main sequence stars  
. . . **sun**  
RT AOSO  
ASTECSolar turboelectric generator  
celestial mechanics  
GRIST (telescope)  
light sources  
OSO  
photosphere  
planets  
satellite solar energy conversion  
satellite solar power stations  
solar activity  
solar activity effects  
solar arrays  
solar atmosphere  
solar atriums  
solar auxiliary power units  
solar blankets  
solar cells  
solar collectors  
solar compasses  
solar constant  
solar cooling  
solar corona  
solar corpuscular radiation  
solar cosmic rays  
solar cycles  
solar eclipses  
solar electric propulsion  
solar electrons  
solar energy  
solar energy absorbers  
solar energy conversion  
solar flares  
solar flux  
solar flux density  
solar furnaces  
solar generators  
solar granulation  
solar gravitation  
solar heating  
solar houses  
solar instruments  
solar interior  
solar limb  
solar longitude  
solar magnetic field  
Solar Maximum Mission

Solar Maximum Mission-A  
Solar Mesosphere Explorer  
solar nebula  
solar neighborhood  
solar neutrinos  
solar oblateness  
solar observatories  
solar orbits  
solar oscillations  
solar parallax  
solar physics  
solar ponds (heat storage)  
solar position  
solar power satellites  
solar powered aircraft  
solar probes  
solar prominences  
solar propulsion  
solar protons  
solar radar echoes  
solar radiation  
Solar Radiation 1 satellite  
Solar Radiation 3 satellite  
solar radiation shielding  
solar radio bursts  
solar reflectors  
solar rotation  
solar sails  
solar sea power plants  
solar sensors  
solar simulation  
solar simulators  
solar spectra  
solar spectrometers  
solar storms  
solar system  
solar system evolution  
solar temperature  
solar terrestrial interactions  
solar thermal propulsion  
solar total energy systems  
solar velocity  
solar wind  
solar wind velocity  
solar x-rays  
sunlight  
Ulysses mission

### *sun sensors*

USE **solar sensors**

### **Sunblazer space probe**

GS unmanned spacecraft  
. space probes  
. . . solar probes  
. . . **Sunblazer space probe**  
RT multistage rocket vehicles  
solid propellant rocket engines

### **sunflowers**

DEF Any of a number of tall related plants having yellow, daisylike flowers with yellow, brown, purple, or almost black disks containing seeds from which an oil is extracted.

GS farm crops  
. **sunflowers**  
plants (botany)  
. **sunflowers**  
RT agriculture  
crop identification  
 $\infty$  crops  
Earth resources

### **sunglasses**

RT eye protection  
eyepieces  
goggles  
optical filters  
visors

### **sunlight**

GS electromagnetic radiation  
. light (visible radiation)  
. . . **sunlight**  
extraterrestrial radiation  
. solar radiation  
. . . **sunlight**  
RT black body radiation  
circumsolar radiation  
climatology

cloud cover  
infrared radiation  
insolation  
sky  
sky brightness  
sky radiation  
solar energy  
solar heating  
sun  
thermal radiation  
ultraviolet radiation  
Umkehr effect  
zodiacal light

### **sunrise**

DEF The crossing of the visible horizon by the upper limb of the ascending sun.

RT morning  
 $\infty$  science  
sunset  
terminator lines

### **sunset**

DEF The crossing of the visible horizon by the upper limb of the descending sun.

RT evening  
 $\infty$  science  
sunrise  
terminator lines

### **sunspot cycle**

DEF A cycle with an average length of 11. 1 years but varying between 7 and 17 years in the number and area of sunspots, as given by the relative sunspot number. This number rises from a minimum of 0 to 10 to a maximum of 50 to 140 about 4 years later, and then declines more slowly.

GS cycles  
. solar cycles  
. . . **sunspot cycle**  
RT solar activity  
starspots  
stellar activity

### **sunspots**

DEF Relatively dark areas on the surface of the sun consisting of dark central umbras surrounded by penumbras which are intermediate in brightness between the umbras and the surrounding photosphere.

GS stellar activity  
. solar activity  
. . . **sunspots**  
. starspots  
. . . **sunspots**  
RT faculae  
magnetic disturbances  
photosphere  
solar cycles  
solar flares  
solar terrestrial interactions  
twenty-seven day variation

### **Sunyaev-Zeldovich effect**

(added July 2000)

DEF Compton scattering of microwave radiation in the vicinity of galaxy clusters resulting in fluctuations in the cosmic microwave background radiation (CMBR).

UF *S-Z effect*  
RT anisotropy  
Compton effect  
cosmic gases  
cosmic microwave background radiation  
 $\infty$  effects  
galactic clusters  
intergalactic media  
microwave scattering  
radio astronomy

relic radiation

*Super Sabre aircraft*  
 USE **F-100 aircraft**

*superalloys*  
 USE **heat resistant alloys**

*supercapacitors*  
 (added September 2003)  
 USE **electrochemical capacitors**

**supercavitating flow**  
 UF *supercavitation*  
 GS fluid flow  
 . turbulent flow  
 . . cavitation flow  
 . . . **supercavitating flow**  
 RT hydrofoil oscillations

*supercavitation*  
 USE **supercavitating flow**

**superchargers**  
 UF *supercharging*  
*turbochargers*  
 GS compressors  
 . **superchargers**  
 RT air intakes  
 blowers  
 centrifugal compressors  
 compressing  
 internal combustion engines  
 turbocompressors  
 turbomachinery

*supercharging*  
 USE **superchargers**

*SuperCobra*  
 (added April 1997)  
 USE **AH-1W helicopter**

**supercomputers**  
 DEF Computers with very large capacity and very high speed.  
 GS data processing equipment  
 . computers  
 . . **supercomputers**  
 . . . Connection Machine  
 . . . Cray computers  
 RT architecture (computers)  
 grid computing (computer networks)  
 hypercube multiprocessors  
 multiprocessing (computers)  
 parallel processing (computers)

**superconducting cavity resonators**  
 (added December 1992)  
 GS resonators  
 . cavity resonators  
 . . **superconducting cavity resonators**  
 superconducting devices  
 . **superconducting cavity resonators**  
 RT microwave oscillators  
 oscillators  
 superconducting films  
 superconducting magnets

**superconducting devices**  
 (added December 1992)  
 GS **superconducting devices**  
 . SIS (superconductors)  
 . squid (detectors)  
 . superconducting cavity resonators  
 . superconducting magnets  
 RT Josephson effect  
 superconducting films  
 superconducting power transmission  
 superconducting super collider  
 tunnel junctions

**superconducting films**  
 (added April 1989)  
 RT BSCCO superconductors  
 ∞ films  
 laser deposition  
 pulsed laser deposition  
 semiconducting films

superconducting cavity resonators  
 superconducting devices  
 superconductors (materials)  
 thick films  
 thin films  
 YBCO superconductors

**superconducting magnets**  
 GS magnets  
 . electromagnets  
 . . **superconducting magnets**  
 superconducting devices  
 . **superconducting magnets**  
 RT cryogenic magnets  
 flux pumps  
 high field magnets  
 high temperature superconductors  
 magnet coils  
 magnetic energy storage  
 superconducting cavity resonators  
 superconducting super collider

**superconducting power transmission**  
 RT ∞ conductivity  
 cryogenics  
 electric power transmission  
 high temperature superconductors  
 low temperature physics  
 power lines  
 superconducting devices  
 transition temperature  
 transmission lines

*superconducting quantum interferometers*  
 USE **squid (detectors)**

**superconducting super collider**  
 GS particle accelerators  
 . **superconducting super collider**  
 RT storage rings (particle accelerators)  
 superconducting devices  
 superconducting magnets

**superconductivity**  
 DEF A property of many elements, alloys, and compounds by virtue of which their electrical resistivity vanishes and they become strongly diamagnetic under appropriate conditions. Used for Meissner effect.  
 UF *Meissner effect*  
 GS electrical properties  
 . electrical resistivity  
 . . **superconductivity**  
 . . . Kondo effect  
 transport properties  
 . electrical resistivity  
 . . **superconductivity**  
 . . . Kondo effect  
 RT Abrikosov theory  
 BCS theory  
 Bloch band  
 ∞ conductivity  
 critical current  
 cryogenics  
 cryotrons  
 electron phonon interactions  
 electron tunneling  
 flux pinning  
 flux pumps  
 gallium alloys  
 high temperature superconductors  
 Josephson junctions  
 Landau factor  
 Landau-Ginzburg equations  
 low temperature physics  
 ∞ solid state physics  
 spin glass  
 transition temperature  
 trapped magnetic fields  
 vector currents  
 vortices  
 YBCO superconductors

*superconductor insulator superconductors*  
 USE **SIS (superconductors)**

**superconductors (materials)**  
 DEF Materials that exhibit superconductivity under appropriate conditions.  
 GS conductors

. **superconductors (materials)**  
 . . high temperature superconductors  
 . . . BSCCO superconductors  
 . . . YBCO superconductors  
 . . heavy fermion superconductors  
 . . organic superconductors

RT Abrikosov theory  
 carrier mobility  
 critical current  
 cryogenic computer storage  
 cryotrons  
 electron gas  
 energy storage  
 flux quantization  
 fullerides  
 heavy fermion systems  
 Josephson effect  
 pinning  
 proximity effect (electricity)  
 solid state devices  
 squid (detectors)  
 strontium oxides  
 superconducting films  
 thermodynamic coupling

**supercooling**  
 UF *undercooling*  
 GS cooling  
 . **supercooling**  
 RT aging (metallurgy)  
 Aitken nuclei  
 condensing  
 convection clouds  
 crystallization  
 heat treatment  
 mechanical properties  
 nucleation  
 quenching (cooling)  
 supersaturation

**supercritical airfoils**  
 GS airfoils  
 . **supercritical airfoils**  
 . . supercritical wings  
 RT airfoil profiles

**supercritical flow**  
 GS fluid flow  
 . **supercritical flow**  
 RT critical flow  
 flow characteristics  
 gas flow  
 liquid flow  
 multiphase flow  
 orifice flow  
 pipe flow  
 pressure gradients  
 single-phase flow  
 steady flow  
 steam flow  
 subcritical flow  
 turbulent flow  
 unsteady flow

**supercritical fluids**  
 RT fluid mechanics  
 ∞ fluids  
 solubility  
 supercritical pressures

**supercritical pressures**  
 GS pressure  
 . **supercritical pressures**  
 thermodynamic properties  
 . thermophysical properties  
 . . **supercritical pressures**  
 RT critical pressure  
 high pressure  
 liquid phases  
 supercritical fluids  
 vapor phases  
 vapor pressure

**supercritical wings**  
 GS airfoils  
 . supercritical airfoils  
 . . **supercritical wings**  
 . wings  
 . . **supercritical wings**  
 RT CL-600 challenger aircraft

## superfluidity

spanloader aircraft  
wing profiles  
∞ winged vehicles

### superfluid flow

USE **superfluidity**

### superfluidity

UF *superfluid flow*  
RT Bose-Einstein condensates  
compressible fluids  
∞ fluids  
incompressible fluids  
Kelvin-Helmholtz instability  
liquid helium  
liquid helium 2  
many body problem  
quantum statistics  
two fluid models  
viscosity  
vortices

### superfortress aircraft

USE **B-50 aircraft**

### supergiant stars

GS celestial bodies  
. stars  
. . **supergiant stars**  
. . . R Coronae Borealis stars  
RT giant stars  
K stars  
M stars  
massive stars  
Mira variables  
subgiant stars

### supergravity

GS gravitation theory  
. **supergravity**  
RT broken symmetry  
cosmology  
field theory (physics)  
gauge invariance  
gauge theory  
gravitinos  
gravitons  
group theory  
lie groups  
particle theory  
quantum theory  
relativity  
supersymmetry  
theoretical physics  
unified field theory  
Yang-Mills theory

### superharmonics

GS harmonics  
. **superharmonics**  
RT cycles  
frequencies  
Mach number  
supersonic wind tunnels  
supersonics

### superheating

GS heating  
. **superheating**  
RT steam

### superheterodyne receivers

GS communication equipment  
. radio receivers  
. . **superheterodyne receivers**  
radio equipment  
. radio receivers  
. . **superheterodyne receivers**  
receivers  
. radio receivers  
. . **superheterodyne receivers**  
RT beat frequencies  
heterodyning

### superhigh frequencies

SN (3 TO 30 GHz)  
UF *KU band*  
*S band*  
*X band*  
GS frequencies

. radio frequencies  
. . microwave frequencies  
. . . **superhigh frequencies**

### RT

C band  
centimeter waves  
unified S band  
VSAT (network)

### superhumps (astronomy)

(added October 1998)

RT accretion disks  
astronomical photometry  
binary stars  
cataclysmic variables  
dwarf novae  
eclipsing binary stars  
stellar spectrophotometry

### superhybrid materials

DEF Composites of polymers, boron-aluminum, and titanium.

GS composite materials

. **superhybrid materials**

. . graphite-epoxy composites

### RT

boron-epoxy composites  
carbon fiber reinforced plastics  
fiber composites  
hybrid composites  
∞ materials  
reinforcing fibers

### superimposition (mathematics)

USE **superposition (mathematics)**

### superlattices

DEF Crystals grown by depositing semiconductors in layers whose thickness is measured in atoms.

GS crystal lattices

. **superlattices**

semiconductors (materials)

. **superlattices**

### RT

antiphase boundaries  
crystal dislocations  
crystal structure  
gallium arsenides  
lattice parameters  
quantum Hall effect

### supermagnets

USE **high field magnets**

### supermassive stars

DEF Stars with masses exceeding about 50 times that of the sun.

GS celestial bodies

. stars

. . **supermassive stars**

### RT

degenerate matter  
massive stars  
Population III stars  
stellar models  
stellar structure

### supernova 1987A

GS celestial bodies

. stars

. . variable stars

. . . supernovae

. . . . **supernova 1987A**

### RT

Magellanic clouds

### supernova remnants

RT black holes (astronomy)  
magnetars  
neutron stars  
North Polar Spur (astronomy)  
pulsars  
red dwarf stars  
soft gamma repeaters  
supernovae  
white dwarf stars  
white holes (astronomy)

### supernovae

GS celestial bodies  
. stars  
. . variable stars  
. . . **supernovae**  
. . . . supernova 1987A

RT Crab nebula  
gravitational collapse  
nebulae  
novae  
Opik theory  
Orion nebula  
stellar mass  
stellar mass ejection  
stellar physics  
supernova remnants

### superoxides

USE **inorganic peroxides**

### superplastic forming

(added July 1994)

UF *SPF (materials)*

### RT

bonding  
elastoplasticity  
metal working  
plastic deformation  
superplasticity

### superplasticity

GS mechanical properties

. plastic properties

. . **superplasticity**

### RT

creep properties  
crystal dislocations  
elongation  
eutectic alloys  
heat resistant alloys  
plastic deformation  
plastic flow  
superplastic forming

### superposition (mathematics)

UF *superimposition (mathematics)*

RT equivalent circuits

linear circuits

∞ mathematics

∞ nets

network analysis  
network synthesis

### superpressure balloons

DEF Meteorological balloons consisting of nonextensible envelopes designed to withstand higher internal pressure differentials than external ones. Such balloons will maintain constant elevations until sufficient gas diffuses from them to cause a change in buoyancy. Used for constant volume balloons and tetroons.

UF *constant volume balloons*

*tetroons*

### GS

expandable structures

. inflatable structures

. . balloons

. . . high altitude balloons

. . . . **superpressure balloons**

### RT

balloon sounding  
meteorological balloons

### superrotation

DEF The generally more rapid relative motions found in the very tenuous regions of the atmosphere at heights around 300 km. The density of the atmosphere decreases rapidly with height and more than 95 percent of the mass of the atmosphere is contained within the troposphere and lower stratosphere. These regions of the atmosphere rotate faster on average than the underlying solid Earth.

GS gyration

. rotation

. . **superrotation**

### RT

atmospheric circulation  
Earth atmosphere  
Earth rotation  
rotating fluids

### supersaturation

RT condensing  
crystallization  
heat treatment  
Mayer problem  
precipitation (chemistry)  
precipitation hardening  
quenching (cooling)  
solid solutions

- supercooling
- supersonic aircraft**
  - SN (AIRCRAFT DESIGNED TO FLY AT SPEEDS ABOVE MACH 1 AND BELOW MACH 5)
  - UF *transonic aircraft*
  - GS **supersonic aircraft**
    - . A-5 aircraft
    - . B-58 aircraft
    - . B-70 aircraft
    - . Boeing 733 aircraft
    - . D-558 aircraft
    - . F-4 aircraft
    - . F-5 aircraft
    - . F-8 aircraft
    - . F-14 aircraft
    - . F-15 aircraft
    - . F-16 aircraft
    - . F-17 aircraft
    - . F-22 aircraft
    - . F-100 aircraft
    - . F-101 aircraft
    - . F-102 aircraft
    - . F-104 aircraft
    - . F-106 aircraft
    - . F-111 aircraft
    - . Firebee 2 target drone aircraft
    - . G-95/4 aircraft
    - . Jaguar aircraft
    - . MiG aircraft
    - . Mirage aircraft
    - . . Mirage 3 aircraft
    - . Nord 1500 aircraft
    - . P-1154 aircraft
    - . Saab 37 aircraft
    - . SR-71 aircraft
    - . supersonic transports
    - . . CL-823 aircraft
    - . . Concorde aircraft
    - . . L-2000 aircraft
    - . . supersonic commercial air transport
    - . . . Boeing 2707 aircraft
    - . . . TU-144 aircraft
    - . T-38 aircraft
    - . TSR-2 aircraft
    - . VJ-101 aircraft
    - . X-1 aircraft
    - . X-2 aircraft
    - . X-3 aircraft
    - . X-15 aircraft
    - . X-32 aircraft
  - RT  $\infty$  aircraft
    - attack aircraft
    - fighter aircraft
    - hypersonic aircraft
    - jet aircraft
    - passenger aircraft
    - reconnaissance aircraft
    - research aircraft
    - $\infty$  subsonic aircraft
    - supersonic cruise aircraft research
    - supersonics
    - sweptback wings
    - transport aircraft
    - trapezoidal tail surfaces
    - variable cycle engines
    - variable stream control engines
- supersonic airfoils**
  - GS airfoils
    - . **supersonic airfoils**
  - RT sweepback
    - sweptback tail surfaces
    - sweptback wings
- supersonic boundary layers**
  - GS boundary layers
    - . **supersonic boundary layers**
  - RT fluid flow
    - laminar boundary layer
    - supersonics
    - turbulent boundary layer
    - two dimensional boundary layer
- supersonic combustion**
  - GS combustion
    - . **supersonic combustion**
  - RT engines
- fuel combustion
- supersonic combustion ramjet engines**
  - UF *scramjet engines*
  - scramjets*
  - GS engines
    - . air breathing engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . ramjet engines
    - . . . . . **supersonic combustion ramjet engines**
    - . internal combustion engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . ramjet engines
    - . . . . . **supersonic combustion ramjet engines**
    - . turbine engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . ramjet engines
    - . . . . . **supersonic combustion ramjet engines**
  - RT combustion
    - missiles
    - ramjet missiles
    - rocket-based combined-cycle engines
  - $\infty$  SCRAM
    - X-43 vehicle
- supersonic commercial air transport**
  - UF *SCAT*
  - GS commercial aircraft
    - . **supersonic commercial air transport**
    - . . Boeing 2707 aircraft
    - . . TU-144 aircraft
    - supersonic aircraft
    - . supersonic transports
    - . . **supersonic commercial air transport**
    - . . . Boeing 2707 aircraft
    - . . . TU-144 aircraft
- supersonic compressors**
  - DEF Compressors in which supersonic velocity is imparted to the fluid relative to the rotor blades, the stator blades, or to both the rotor and the stator blades, producing oblique shock waves over the blades to obtain a high pressure rise.
  - GS compressors
    - . **supersonic compressors**
  - RT oblique shock waves
    - transonic compressors
    - turbocompressors
- supersonic cruise aircraft research**
  - UF *SCAR program*
  - GS programs
    - . NASA programs
    - . . **supersonic cruise aircraft research**
  - RT  $\infty$  aircraft
    - supersonic aircraft
    - supersonic transports
- supersonic diffusers**
  - DEF Diffusers designed to reduce the velocity and increase the pressure of fluid moving at supersonic velocities.
  - RT air intakes
    - $\infty$  diffusers
    - exhaust diffusers
    - flow stability
    - vaneless diffusers
- supersonic drag**
  - GS aerodynamic characteristics
    - . aerodynamic drag
    - . . **supersonic drag**
    - . aerodynamic forces
    - . aerodynamic drag
    - . . **supersonic drag**
    - . dynamic characteristics
    - . drag
    - . . friction drag
    - . . . aerodynamic drag
    - . . . . **supersonic drag**
- . . pressure drag
  - . . . **supersonic drag**
  - friction
    - . flow resistance
    - . . friction drag
    - . . . aerodynamic drag
    - . . . . **supersonic drag**
    - . skin friction
    - . . friction drag
    - . . aerodynamic drag
    - . . . **supersonic drag**
  - RT interference drag
  - wave drag
- supersonic flight**
  - RT caustic lines
  - $\infty$  flight
    - hypersonic flight
    - jet lag
    - Mach cones
    - missiles
    - rocket flight
    - sonic booms
    - supersonics
    - transonic flight
- supersonic flow**
  - DEF In aerodynamics, flow of a fluid over a body at speeds greater than the acoustic velocity and in which the shock waves start at the surface of the body.
  - GS fluid flow
    - . **supersonic flow**
    - . . supersonic jet flow
  - RT aerodynamics
    - compressibility effects
    - compressible flow
    - flow velocity
    - gas flow
    - Godunov method
    - hypersonic flow
    - hypervelocity flow
    - Mach cones
    - Prandtl-Meyer expansion
    - secondary injection
    - shock waves
    - transonic flow
    - wedge flow
    - wind tunnels
  - supersonic flow inlets*
  - USE **supersonic inlets**
- supersonic flutter**
  - GS vibration
    - . structural vibration
    - . . flutter
    - . . . **supersonic flutter**
    - . . self induced vibration
    - . . . **supersonic flutter**
  - RT missile vibration
    - transonic flutter
- supersonic heat transfer**
  - GS transmission
    - . heat transmission
    - . . heat transfer
    - . . . aerodynamic heat transfer
    - . . . . **supersonic heat transfer**
  - RT hypersonic heat transfer
    - supersonics
- supersonic inlets**
  - UF *supersonic flow inlets*
  - transonic inlets*
  - GS intake systems
    - . air intakes
    - . . **supersonic inlets**
  - RT bypass ratio
    - hypersonic inlets
    - inlet airframe configurations
    - inlet flow
    - internal compression inlets
    - nose inlets
    - side inlets
- supersonic jet flow**
  - GS fluid flow
    - . jet flow
    - . . **supersonic jet flow**



## supersonic low altitude missile

. supersonic flow  
. . **supersonic jet flow**  
RT gas flow  
nozzle flow  
screech tones

**supersonic low altitude missile**  
UF *SLAM*  
GS missiles  
. ramjet missiles  
. . **supersonic low altitude missile**  
. surface to surface missiles  
. . **supersonic low altitude missile**  
RT nuclear ramjet engines  
Pluto reactors  
ramjet engines

**supersonic nozzles**  
DEF Converging diverging nozzles designed to accelerate a fluid to supersonic speed.  
RT coaxial nozzles  
conical nozzles  
convergent-divergent nozzles  
hypersonic nozzles  
∞ nozzles  
rocket nozzles  
screech tones  
sonic nozzles  
transonic nozzles  
variable stream control engines  
wind tunnel nozzles

**supersonic speed**  
SN (BETWEEN MACH 1 AND 4. 9)  
GS rates (per time)  
. **supersonic speed**  
velocity  
. **supersonic speed**  
RT acoustic velocity  
high speed  
hypersonic speed  
hypersonics  
supersonics  
transonic speed

**supersonic test apparatus**  
RT hypersonic test apparatus  
supersonics  
∞ test equipment  
wind tunnel apparatus

**supersonic transports**  
GS supersonic aircraft  
. **supersonic transports**  
. . CL-823 aircraft  
. . Concorde aircraft  
. . L-2000 aircraft  
. . supersonic commercial air transport  
. . . Boeing 2707 aircraft  
. . . TU-144 aircraft  
RT cargo aircraft  
commercial aircraft  
passenger aircraft  
supersonic cruise aircraft research

**supersonic turbines**  
UF *transonic turbines*  
GS turbomachinery  
. turbines  
. . **supersonic turbines**  
RT gas turbine engines  
gas turbines  
rotor stator interactions

**supersonic wakes**  
GS wakes  
. **supersonic wakes**  
RT aircraft wakes  
hypersonic wakes

**supersonic wind tunnels**  
GS test facilities  
. wind tunnels  
. . **supersonic wind tunnels**  
RT blowdown wind tunnels  
hypersonic wind tunnels  
hypervelocity wind tunnels  
low density wind tunnels  
shock tunnels

slotted wind tunnels  
subsonic wind tunnels  
superharmonics  
transonic wind tunnels

**supersonics**  
DEF Specifically, the study of aerodynamics of supersonic speeds.  
GS mechanics (physics)  
. fluid mechanics  
. . fluid dynamics  
. . . gas dynamics  
. . . . aerodynamics  
. . . . . **supersonics**  
RT aerothermodynamics  
hypersonics  
Mach cones  
superharmonics  
supersonic aircraft  
supersonic boundary layers  
supersonic flight  
supersonic heat transfer  
supersonic speed  
supersonic test apparatus

*superstring theory*  
USE **string theory**

**supersymmetry**  
GS symmetry  
. **supersymmetry**  
RT bosons  
broken symmetry  
cosmology  
fermions  
field theory (physics)  
gauge theory  
grand unified theory  
gravitation theory  
group theory  
lie groups  
particle theory  
quantum theory  
string theory  
supergravity  
theoretical physics  
unified field theory

**supine position**  
RT acceleration protection  
head up tilt  
prone position  
rest  
sitting position  
tilt-table test

**supplements**  
GS documents  
. **supplements**  
RT contracts  
extensions  
indexes (documentation)  
motion pictures  
records  
reports

**supplying**  
RT commerce  
consumption  
demand (economics)  
filling  
injection  
input  
marketing  
output

**support interference**  
RT antenna radiation patterns  
∞ interference  
supports  
vibration effects

**support systems**  
GS **support systems**  
. ground operational support system  
. ground support systems  
. life support systems  
. . biopaks  
. . closed ecological systems  
. . emergency life sustaining systems

. . . AEPS  
. . . portable life support systems  
. . . AEPS  
. . . IMLSS  
. decision support systems  
. pilot support systems  
RT self sealing  
services  
∞ systems

**supports**  
UF *mounts*  
*stands*  
GS **supports**  
. pylons  
. saddles (supports)  
. tripods  
RT bearings  
carriages  
chassis  
foundations  
frames  
gimbals  
∞ headers  
lugs  
pivots  
∞ platforms  
pylon mounting  
racks (frames)  
reinforcement (structures)  
shafts (machine elements)  
struts  
substructures  
support interference  
∞ sustaining  
trusses

*suppression*  
USE **retarding**

**suppressors**  
GS **suppressors**  
. echo suppressors  
RT absorbers (materials)  
additives  
attenuators  
baffles  
circuit protection  
damping  
infrared suppression  
inhibitors  
insulation  
isolators  
mufflers  
neutralizers  
noise reduction  
retardants  
shielding  
silencers  
squelch circuits

**surface acoustic wave devices**  
UF *S-A-W devices*  
RT acoustic delay lines  
bulk acoustic wave devices  
∞ devices  
electroacoustic transducers  
electroacoustics  
interdigital transducers  
microsonics  
signal processing  
sound waves  
ultrasonic wave transducers

**surface cooling**  
GS cooling  
. **surface cooling**  
RT convective heat transfer  
evaporative cooling  
film cooling  
radiant cooling  
radiative heat transfer  
∞ surfaces  
sweat cooling  
temperature

**surface cracks**  
UF *crazing*  
GS fractures (materials)  
. cracks

- . . **surface cracks**
- surface properties
- . **surface cracks**
- RT crack closure
- crack geometry
- crack initiation
- crack propagation
- edge cracks
- microcracks
- solid surfaces
- ∞ surfaces
- surface defects**
- GS defects
- . **surface defects**
- surface properties
- . **surface defects**
- RT caustics (optics)
- crack initiation
- crystal defects
- crystal dislocations
- fatigue (materials)
- mechanical properties
- point defects
- ∞ surfaces
- surface diffusion**
- GS diffusion
- . **surface diffusion**
- RT adatoms
- molecular diffusion
- ∞ surfaces
- thermal diffusion
- surface distortion**
- GS distortion
- . **surface distortion**
- RT ∞ surface geometry
- ∞ surfaces
- warpage
- surface effect ships**
- DEF Vessels using ground effect principle and having submerged rigid sidewalls (sealants). Used for SES.
- UF SES
- GS surface vehicles
- . **surface effect ships**
- water vehicles
- . ships
- . . **surface effect ships**
- RT captured air bubble vehicles
- ∞ effects
- research vehicles
- ∞ surfaces
- SWATH (ship)
- ∞ vehicles
- wing-in-ground effect vehicles
- surface emitting lasers**
- (added March 1992)
- GS stimulated emission devices
- . lasers
- . . **surface emitting lasers**
- RT laser arrays
- lasing
- light emitting diodes
- semiconductor lasers
- solid state lasers
- stimulated emission
- waveguide lasers
- surface energy**
- GS surface properties
- . **surface energy**
- thermodynamic properties
- . **surface energy**
- RT activation energy
- electron energy
- ∞ energy
- interfacial energy
- interfacial tension
- proton energy
- ∞ surfaces
- thermophysical properties
- surface finishing**
- GS surface treatment
- . **surface finishing**
- RT cleaning
- coating
- coatings
- corrosion prevention
- corrosion resistance
- electroplating
- electropolishing
- finishes
- machining
- metal finishing
- metal grinding
- metal polishing
- metal spraying
- metal surfaces
- micromachining
- polishing
- protective coatings
- shot peening
- solid surfaces
- sputtering
- ∞ surfaces
- wear
- ∞ **surface geometry**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT concavity
- convexity
- Cosserat surfaces
- flat surfaces
- flatness
- geometry
- Lambert surface
- lofting
- planforms
- shapes
- surface distortion
- surface layers
- surface properties
- surface reactions
- surface roughness
- surface stability
- ∞ surfaces
- surface interactions*
- USE **surface reactions**
- surface ionization**
- GS ionization
- . **surface ionization**
- RT ionizers
- ∞ surfaces
- surface layers**
- RT atmospheric stratification
- barrier layers
- boundary layer thickness
- boundary layers
- crystal surfaces
- ∞ layers
- lunar surface
- monomolecular films
- oxide films
- solar granulation
- ∞ surface geometry
- surface treatment
- ∞ surfaces
- thermoclines
- ∞ transition layers
- Surface Meteorology and Solar Energy project**
- (added October 2007)
- DEF A 10-year project to produce and archive a global data set of the Earth's radiation budget (shortwave and longwave) using International Satellite Cloud Climatology Project (IS-CCP) data and radiative transfer models. The SSE data sets contain insolation and meteorology data intended to aid in the development of renewable energy systems.
- UF SSE project
- GS programs
- . projects
- . . **Surface Meteorology and Solar Energy project**
- RT data products
- Earth radiation budget
- insolation
- long wave radiation
- radiative transfer
- remote sensing
- renewable energy
- satellite observation
- short wave radiation
- solar energy
- surface navigation**
- UF *marine navigation*
- GS navigation
- . **surface navigation**
- RT celestial navigation
- dead reckoning
- Decca navigation
- digital navigation
- hyperbolic navigation
- inertial navigation
- LORAC navigation system
- loran
- nautical charts
- navigation aids
- radar navigation
- radio navigation
- ships
- ∞ surfaces
- unmanned ground vehicles
- surface noise interactions**
- RT acoustic excitation
- acoustic scattering
- aeroacoustics
- aerodynamic noise
- Ffowcs Williams-Hawkings equation
- rotor stator interactions
- turbulence
- surface plasmon resonance**
- (added April 2004)
- DEF A condition of resonance in which the propagation of surface plasmon waves occurs at the interface of a dielectric with a highly reflective metal.
- RT plasmons
- surface pressure*
- USE **pressure**
- surface properties**
- UF *Bardeen approximation*
- GS **surface properties**
- . adhesion
- . . stiction
- . adsorptivity
- . coefficient of friction
- . interfacial tension
- . spectral reflectance
- . surface cracks
- . surface defects
- . surface energy
- . surface roughness
- . surface stability
- . surface temperature
- . . land surface temperature
- . . sea surface temperature
- . . skin temperature (non-biological)
- . . wall temperature
- RT absorptance
- albedo
- atomic force microscopy
- bidirectional reflectance
- coarseness
- coating
- coatings
- color
- contact potentials
- contact resistance
- corrosion
- Cosserat surfaces
- diffusion
- effervescence
- emissivity
- evanescence
- finishes
- flat surfaces
- foaming
- friction
- hardness
- hot corrosion
- hydrophobicity
- interfaces

## Surface Radiation Budget project

- Jupiter red spot
- lunar albedo
- lunar surface
- lunar topography
- mechanical properties
- metal surfaces
- optical properties
- permeability
- ∞ physical properties
- planar structures
- planetary surfaces
- profilometers
- ∞ properties
- reflectance
- roughness
- selenography
- solid surfaces
- solid-solid interfaces
- sorption
- ∞ surface geometry
- surface tension driven convection
- surface treatment
- ∞ surfaces
- textures
- viscosity
- void ratio
- wettability

### Surface Radiation Budget project

(added October 2007)

DEF A 12-year project to produce and archive a global data set of shortwave and long-wave Earth surface and top of the atmosphere parameters using International Satellite Cloud Climatology Project (ISCCP) and Earth Radiation Budget Experiment (ERBE) data. The SRB data sets contain three hourly, daily, and monthly averages of surface longwave and shortwave radiative properties, cloud amount, and meteorological properties computed using models.

UF *SRB project*

GS programs

. projects

. . **Surface Radiation Budget project**

RT

data products  
Earth radiation budget  
long wave radiation  
radiative transfer  
remote sensing  
satellite observation  
short wave radiation

### surface reactions

UF *surface interactions*

RT chemical reactions

erosion  
fluid-solid interactions  
gas-liquid interactions  
interfaces  
metal surfaces  
metal-water reactions  
spacecraft glow  
∞ surface geometry  
∞ surfaces  
surfactants  
vaporizing

### surface roughness

DEF The deviation of the topography of an actual surface from an ideal atomically smooth and planar surface.

GS roughness

. **surface roughness**  
surface properties

RT

. **surface roughness**  
coarseness  
friction  
lunar topography  
machining  
mechanical properties  
profilometers  
runway conditions  
∞ surface geometry  
∞ surfaces  
topography

### surface roughness effects

RT ∞ effects

friction drag  
reflectance  
separated flow  
speckle patterns  
∞ surfaces

### surface stability

GS

stability  
. **surface stability**  
surface properties  
. **surface stability**  
RT coarseness  
dynamic stability  
interfacial tension  
motion stability  
static stability  
storage stability  
∞ surface geometry  
∞ surfaces  
thermal stability

### surface temperature

GS

surface properties  
. **surface temperature**  
. . land surface temperature  
. . sea surface temperature  
. . skin temperature (non-biological)  
. . wall temperature  
temperature  
. **surface temperature**  
. . land surface temperature  
. . sea surface temperature  
. . skin temperature (non-biological)  
. . wall temperature  
RT coarseness  
geothermal anomalies  
ocean temperature  
∞ surfaces  
temperature sensitive paints  
thermoclines  
water temperature

### surface tension

USE

**interfacial tension**

### surface tension driven convection

(added December 1995)

GS convection

. **surface tension driven convection**  
. . Marangoni convection  
RT capillary flow  
convective flow  
interfacial tension  
∞ microgravity applications  
oscillating flow  
surface properties

### surface to air missiles

UF *ground-to-air missiles*

GS

missiles  
. **surface to air missiles**  
. . Blue Goose missile  
. . BOMARC missiles  
. . . BOMARC A missile  
. . . BOMARC B missile  
. . Chaparral missile  
. . Hawk missile  
. . Mauler missile  
. . Nike missiles  
. . . Nike-Ajax missile  
. . . Nike-Hercules missile  
. . . Nike-Zeus missile  
. . Patriot missile  
. . Redeye missile  
. . Sprint missile  
. . Talos missile  
. . tartar missile  
. . terrier missile  
RT air to air missiles  
air to surface missiles  
antiaircraft missiles  
antimissile missiles  
Nike X systems  
ramjet missiles  
∞ rockets  
Sentinel system  
space weapons  
Spartan missile

∞ surfaces

### surface to surface missiles

GS

missiles  
. **surface to surface missiles**  
. . antitank missiles  
. . . Shillelagh missiles  
. . . tow missiles  
. . Corporal missile  
. . cruise missiles  
. . . Navaho missile  
. . . Tomahawk missiles  
. . fleet ballistic missiles  
. . . Polaris A1 missile  
. . . Polaris A2 missile  
. . . Polaris A3 missile  
. . . Poseidon missiles  
. . . Subroc missile  
. . Intercontinental ballistic missiles  
. . . Atlas ICBM  
. . . . Atlas D ICBM  
. . . . Atlas E ICBM  
. . . . Atlas F ICBM  
. . . Minuteman ICBM  
. . . MX missile  
. . . Titan ICBM  
. . . . Titan 1 ICBM  
. . . . Titan 2 ICBM  
. . intermediate range ballistic missiles  
. . . Blue Streak missile  
. . . Jupiter missile  
. . . polaris missiles  
. . . . Polaris A1 missile  
. . . . Polaris A2 missile  
. . . . Polaris A3 missile  
. . Lance missile  
. . Mace missiles  
. . Pershing missile  
. . Regulus missile  
. . sergeant missiles  
. . short range ballistic missiles  
. . supersonic low altitude missile  
. . V-1 missile  
RT air to surface missiles  
ballistic missiles  
Harpoon missile  
ramjet missiles  
∞ rockets  
∞ surfaces

### surface to surface rockets

GS

rocket vehicles  
. **surface to surface rockets**  
. . Honest John rocket vehicle  
. . Little John rocket vehicle  
RT ∞ rockets  
∞ surfaces

### surface treatment

(added April 1990)

GS **surface treatment**

. surface finishing  
RT anodizing  
coating  
corrosion prevention  
paint removal  
surface layers  
surface properties  
∞ treatment

### surface vehicles

GS **surface vehicles**

. aircraft carriers  
. automated transit vehicles  
. . automated guideway transit vehicles  
. boats  
. lifeboats  
. captured air bubble vehicles  
. cargo ships  
. . Savannah nuclear ship  
. . tanker ships  
. dollies  
. electric hybrid vehicles  
. lunar surface vehicles  
. . lunar mobile laboratories  
. . lunar roving vehicles  
. . . Lunokhod lunar roving vehicles  
. . . manned lunar surface vehicles  
. . magnetic levitation vehicles

. motor vehicles  
 . . . automated mixed traffic vehicles  
 . . . automobiles  
 . . . electric automobiles  
 . . . electric motor vehicles  
 . . . electric automobiles  
 . . . tractors  
 . . . crawler tractors  
 . . . tracked vehicles  
 . . . trucks  
 . . . tank trucks  
 . nuclear powered ships  
 . . Savannah nuclear ship  
 . roadway powered vehicles  
 . roving vehicles  
 . . lunar roving vehicles  
 . . . Lunokhod lunar roving vehicles  
 . . . manned lunar surface vehicles  
 . . Mars roving vehicles  
 . . . Marsokhod Mars roving vehicles  
 . satellite communications ships  
 . sleds  
 . . rocket propelled sleds  
 . surface effect ships  
 . SWATH (ship)  
 . tanks (combat vehicles)  
 . transporter  
 . unmanned ground vehicles  
 . walking machines  
 RT amphibious vehicles  
 ∞ bicycle  
 ground effect machines  
 rail transportation  
 rails  
 ships  
 ∞ surfaces  
 underwater vehicles  
 urban transportation  
 ∞ vehicles  
 vehicular tracks  
 water vehicles

**surface water**

DEF All the waters on the surface of the Earth including fresh and salt water, ice and snow.

GS water  
 . **surface water**  
 RT Earth resources  
 ground water  
 lakes  
 polynyas  
 ponds  
 rivers  
 streams  
 ∞ surfaces  
 water sampling

**surface waves**

SN (EXCLUDES SURFACE RADIO WAVES)  
 GS **surface waves**  
 . capillary waves  
 . . gravity waves  
 . . . baroclinic waves  
 . . ripples  
 . electromagnetic surface waves  
 . evanescent waves  
 . Sommerfeld waves  
 RT bow waves  
 cnoidal waves  
 crustal fractures  
 elastic waves  
 internal waves  
 lee waves  
 liquid surfaces  
 Love waves  
 microsonics  
 P waves  
 S waves  
 sea roughness  
 seismic waves  
 splashing  
 ∞ surfaces  
 tropospheric waves  
 tsunami waves  
 water currents  
 water waves

∞ waves

**surface-active agents**USE **surfactants**∞ **surfaces**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 UF *curved surfaces*  
*lifting surfaces*  
 RT air to surface missiles  
 airfield surface movements  
 airport surface detection equipment  
 Apollo Lunar Surface Experiments Package  
 area  
 cold surfaces  
 control surfaces  
 Cosserat surfaces  
 crystal surfaces  
 Earth surface  
 EASEP  
 electromagnetic surface waves  
 elevators (control surfaces)  
 external surface currents  
 Fermi surfaces  
 flaps (control surfaces)  
 flat surfaces  
 horizontal tail surfaces  
 hot surfaces  
 interfaces  
 interfacial tension  
 Lambert surface  
 liquid surfaces  
 LSSM  
 lunar surface  
 lunar surface vehicles  
 manned lunar surface vehicles  
 Mars surface  
 Mars surface samples  
 menisci  
 metal surfaces  
 minimal surfaces  
 ocean surface  
 planetary surfaces  
 satellite surfaces  
 sizing (surface treatment)  
 solid surfaces  
 surface cooling  
 surface cracks  
 surface defects  
 surface diffusion  
 surface distortion  
 surface effect ships  
 surface energy  
 surface finishing  
 ∞ surface geometry  
 surface ionization  
 surface layers  
 surface navigation  
 surface properties  
 surface reactions  
 surface roughness  
 surface roughness effects  
 surface stability  
 surface temperature  
 surface to air missiles  
 surface to surface missiles  
 surface to surface rockets  
 surface vehicles  
 surface water  
 surface waves  
 sweptback tail surfaces  
 T tail surfaces  
 tabs (control surfaces)  
 tail surfaces  
 Townsend avalanche  
 trapezoidal tail surfaces  
 two dimensional bodies  
 under surface blowing  
 underwater to surface missiles  
 upper surface blowing  
 upper surface blown flaps  
 Venus surface  
 wear

**surfactants**

DEF A material that improves the emulsifying, dispersing, wetting, or other surface-

modifying properties of liquids. Used for surface-active agents.

UF *surface-active agents*  
 RT admixtures  
 ∞ agents  
 detergents  
 hydrophobicity  
 monomolecular films  
 plasticizers  
 retardants  
 soaps  
 surface reactions  
 zwitterions

**surgeons**

GS personnel  
 . medical personnel  
 . . **surgeons**  
 . . . flight surgeons

**surgery**

GS medical science  
 . **surgery**  
 . . labyrinthectomy  
 RT clinical medicine  
 heart implantation  
 ∞ operations  
 skin grafts  
 transplantation  
 veterinary medicine

**surges**

DEF Transient rises in power or pressure such as a brief rise in the discharge pressure of a rotary compressor. Used for transients (surges).

UF *transients (surges)*  
 RT circuit protection  
 fluid flow  
 overvoltage  
 storm surges  
 variations  
 water hammer  
 ∞ waves

**surgical instruments**

GS medical equipment  
 . **surgical instruments**  
 RT ∞ instruments  
 needles

**Surinam**

GS nations  
 . **Surinam**  
 RT Caribbean region  
 Netherlands  
 South America

**surveillance**

GS **surveillance**  
 . space surveillance (ground based)  
 . space surveillance (spaceborne)  
 RT command and control  
 conical scanning  
 crime  
 detection  
 Earth resources  
 forest fire detection  
 ice mapping  
 ice reporting  
 inspection  
 observation  
 panoramic scanning  
 radar scanning  
 reconnaissance  
 scanning  
 situational awareness  
 target acquisition  
 target recognition  
 targets  
 visual observation

**surveillance radar**

GS radar  
 . **surveillance radar**  
 . . airborne surveillance radar  
 . . Cobra Dane (radar)  
 . . multistatic radar  
 RT air traffic control  
 airport surface detection equipment

## Surveyor 1 lunar probe

- coherent radar
- continuous wave radar
- digital radar systems
- Doppler radar
- meteorological radar
- pulse radar
- radar approach control
- radar tracking
- radarscopes
- satellite-borne radar
- search radar
- space-time adaptive processing
- synthetic aperture radar
- tracking radar

### surveying

USE **surveys**

### Surveyor 1 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 1 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 1 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 1 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor 2 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 2 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 2 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 2 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor 3 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 3 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 3 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 3 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor 4 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 4 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 4 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 4 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor 5 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 5 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 5 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes

### Surveyor 5 lunar probe

RT Atlas Centaur launch vehicle

### Surveyor 6 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 6 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 6 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 6 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor 7 lunar probe

GS lunar spacecraft

- . lunar probes
- .. Surveyor lunar probes
- ... **Surveyor 7 lunar probe**
- soft landing spacecraft
- . Surveyor lunar probes
- .. **Surveyor 7 lunar probe**
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... Surveyor lunar probes
- .... **Surveyor 7 lunar probe**

RT Atlas Centaur launch vehicle

### Surveyor lunar probes

GS lunar spacecraft

- . lunar probes
- ... **Surveyor lunar probes**
- ... Surveyor 1 lunar probe
- ... Surveyor 2 lunar probe
- ... Surveyor 3 lunar probe
- ... Surveyor 4 lunar probe
- ... Surveyor 5 lunar probe
- ... Surveyor 6 lunar probe
- ... Surveyor 7 lunar probe
- soft landing spacecraft
- . **Surveyor lunar probes**
- .. Surveyor 1 lunar probe
- .. Surveyor 2 lunar probe
- .. Surveyor 3 lunar probe
- .. Surveyor 4 lunar probe
- .. Surveyor 5 lunar probe
- .. Surveyor 6 lunar probe
- .. Surveyor 7 lunar probe
- unmanned spacecraft
- . space probes
- .. lunar probes
- ... **Surveyor lunar probes**
- .... Surveyor 1 lunar probe
- .... Surveyor 2 lunar probe
- .... Surveyor 3 lunar probe
- .... Surveyor 4 lunar probe
- .... Surveyor 5 lunar probe
- .... Surveyor 6 lunar probe
- .... Surveyor 7 lunar probe

### Surveyor project

GS programs

- . lunar programs
- .. **Surveyor project**
- . NASA programs
- .. NASA space programs
- ... **Surveyor project**
- . projects
- .. **Surveyor project**
- . space programs
- .. NASA space programs
- ... **Surveyor project**

RT Atlas Centaur launch vehicle

Centaur project

- lunar landing
- lunar probes
- lunar spacecraft
- soft landing
- soft landing spacecraft

### surveys

UF *surveying*

GS **surveys**

- . geodetic surveys
- . geological surveys

- . sky surveys (astronomy)

- . wage surveys

RT accuracy

- construction
- ∞ cross sections
- data acquisition
- data management
- datum (elevation)
- exploration
- general overviews
- geometry
- layouts
- loran
- mapping
- maps
- photogrammetry
- position (location)
- reconnaissance
- soil mapping
- ∞ statistics

### survival

RT aircraft survivability

- civil defense
- closed ecological systems
- desert adaptation
- kits
- life support systems
- lunar shelters
- shelters
- spacecraft survivability

### survival equipment

RT AEPS

- aircraft survivability
- Assured Crew Return Vehicle
- consumables (spacecrew supplies)
- emergency life sustaining systems
- ∞ equipment
- lifeboats
- onboard equipment
- oxygen supply equipment
- rafts

### susceptibility (magnetism)

USE **magnetic permeability**

### suspending (hanging)

GS **suspending (hanging)**

- . hindlimb suspension
- . magnetic suspension

RT gyroscope fluids

- mounting
- suspension systems (vehicles)
- ∞ suspensions

### suspending (mixing)

GS mixing

- . **suspending (mixing)**

RT aeration

- agitation
- colloiding
- dispersing
- dispersions
- entrainment
- ferrofluids
- homogenizing
- shaking
- stirring
- ∞ suspensions

### suspension systems (vehicles)

RT bearings

- flotation
- levitation
- magnetic levitation vehicles
- riding quality
- shock absorbers
- springs (elastic)
- steering
- suspending (hanging)
- ∞ suspensions
- ∞ systems
- toroidal wheels
- undercarriages
- vehicle wheels
- vehicular tracks

- vibration isolators
- ∞ **suspensions**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 DEF A two-phase system consisting of a finely divided solid dispersed in a solid, liquid, or gas.  
 RT Brownian movements  
 dispersions  
 ferrofluids  
 solid suspensions  
 suspending (hanging)  
 suspending (mixing)  
 suspension systems (vehicles)
- Susquehanna River Basin (MD-NY-PA)**  
 GS landforms  
 . structural basins  
 . . river basins  
 . . . **Susquehanna River Basin (MD-NY-PA)**  
 RT Maryland  
 New York  
 Pennsylvania  
 rivers  
 streams  
 valleys
- sustainer rocket engines**  
 DEF Rocket engines that maintain the velocity of the rocket once it has achieved its programmed velocity by use of boosters or other engines.  
 GS engines  
 . rocket engines  
 . . **sustainer rocket engines**  
 RT booster rocket engines  
 ducted rocket engines  
 electric rocket engines  
 electrostatic engines  
 electrothermal engines  
 hybrid propellant rocket engines  
 internal combustion engines  
 ion engines  
 launch vehicles  
 liquid air cycle engines  
 liquid propellant rocket engines  
 nuclear engine for rocket vehicles  
 nuclear rocket engines  
 restartable rocket engines  
 solid propellant rocket engines  
 stage separation  
 ∞ sustaining  
 turborocket engines  
 TX-354 engine
- ∞ **sustaining**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT life support systems  
 supports  
 sustainer rocket engines
- swaging**  
 RT cold working  
 metal working  
 stamping
- swallowing**  
 RT drinking  
 eating  
 ingestion (biology)
- swamps*  
 USE **marshlands**
- Swan bands**  
 GS spectra  
 . spectral bands  
 . . **Swan bands**  
 RT ∞ bands  
 carbon compounds  
 chemical bonds  
 emission spectra  
 molecular spectra
- swarming**  
 RT bees
- ∞ motion
- SWAS (satellite)*  
 (added November 2000)  
 USE **Submillimeter Wave Astronomy Satellite**
- swash*  
 USE **splashing**
- SWATH (ship)**  
 DEF Small waterplane area twin hull concept extension of hydrofoils for improving seaworthiness and speed. Used for Small Waterplane Area Twin Hull.  
 UF *Small Water Plane Area Twin Hull*  
 GS surface vehicles  
 . **SWATH (ship)**  
 water vehicles  
 . ships  
 . . **SWATH (ship)**  
 RT captured air bubble vehicles  
 hulls (structures)  
 surface effect ships  
 ∞ vehicles
- swath width**  
 DEF The width of the area covered by an imaging sensor determined by the geometry of the instrument.  
 RT agricultural aircraft  
 flight paths  
 remote sensing  
 satellite observation
- Swaziland**  
 GS nations  
 . **Swaziland**  
 RT Africa  
 Republic of South Africa
- sweat**  
 GS body fluids  
 . **sweat**  
 secretions  
 . **sweat**  
 RT perspiration
- sweat cooling**  
 DEF A process by which a body having a porous surface is cooled by forced flow of coolant through the surface from the interior. Used for transpiration cooling.  
 UF *transpiration cooling*  
 GS cooling  
 . evaporative cooling  
 . . **sweat cooling**  
 RT film cooling  
 liquid cooling  
 surface cooling
- sweating*  
 USE **perspiration**
- Sweden**  
 GS nations  
 . **Sweden**  
 RT Europe  
 JAS-39 aircraft  
 Scandinavia  
 Swedish space program
- Swedish space program**  
 GS programs  
 . space programs  
 . . European space programs  
 . . . **Swedish space program**  
 RT Sweden
- sweep angle**  
 GS geometry  
 . Euclidean geometry  
 . . angles (geometry)  
 . . . **sweep angle**  
 . . . . sweepback  
 . . . . leading edge sweep  
 RT aerodynamic stalling  
 angle of attack  
 boundary layer separation
- Mach number
- sweep circuits**  
 GS circuits  
 . **sweep circuits**  
 RT frequency scanning  
 oscilloscopes  
 sampling
- sweep effect**  
 RT ∞ effects  
 force distribution  
 lift  
 ∞ loading  
 wing loading
- sweep frequency**  
 UF *electron sweeping*  
 GS frequencies  
 . **sweep frequency**  
 RT carrier frequencies  
 frequency analyzers  
 frequency scanning  
 frequency synchronization  
 oscilloscopes  
 television transmission
- sweepback**  
 UF *sweepback angles*  
 GS geometry  
 . Euclidean geometry  
 . . angles (geometry)  
 . . . sweep angle  
 . . . . **sweepback**  
 . . . . leading edge sweep  
 RT supersonic airfoils
- sweepback angles*  
 USE **sweepback**
- swelling**  
 RT distortion  
 expansion  
 growth  
 increasing  
 inflating  
 spreading
- swept forward wings**  
 GS airfoils  
 . wings  
 . . swept wings  
 . . . **swept forward wings**  
 . . . . trapezoidal wings  
 planforms  
 . wing planforms  
 . . **swept forward wings**  
 . . . trapezoidal wings  
 RT sweptback wings  
 variable sweep wings  
 X-29 aircraft
- swept wings**  
 UF *cranked wings*  
*diamond wings*  
*tapered wings*  
 GS airfoils  
 . wings  
 . . **swept wings**  
 . . . swept forward wings  
 . . . . trapezoidal wings  
 . . . . sweptback wings  
 . . . . arrow wings  
 . . . . delta wings  
 . . . . trapezoidal wings  
 RT fixed wings  
 spanloader aircraft  
 unswept wings  
 wing planforms
- sweptback tail surfaces**  
 GS assemblies  
 . tail assemblies  
 . . **sweptback tail surfaces**  
 planforms  
 . **sweptback tail surfaces**  
 tail surfaces  
 . **sweptback tail surfaces**  
 RT control surfaces  
 hypersonic aircraft

## sweptback wings

- rudders
- stabilizers (fluid dynamics)
- supersonic airfoils
- ∞ surfaces
- T tail surfaces
- trapezoidal tail surfaces

### sweptback wings

- GS airfoils
  - . wings
  - . . swept wings
  - . . . **sweptback wings**
  - . . . . arrow wings
  - . . . . . delta wings
  - . . . . . trapezoidal wings
- planforms
- . wing planforms
- . . **sweptback wings**
- . . . arrow wings
- . . . . delta wings
- . . . . . trapezoidal wings

RT hypersonic aircraft  
supersonic aircraft  
supersonic airfoils  
swept forward wings  
variable sweep wings

### Swift observatory

(added August 2005)

DEF A MIDEX (Medium-class Explorer) program satellite launched on November 20, 2004 for rapid observation of gamma ray bursts and their afterglows in gamma ray, x ray, ultraviolet, and optical wavelengths.

- GS artificial satellites
  - . scientific satellites
  - . . astronomical satellites
  - . . . **Swift observatory**
  - observatories
  - . astronomical observatories
  - . . astronomical satellites
  - . . . **Swift observatory**
- RT afterglows
- gamma ray astronomy
- gamma ray bursts
- gamma ray sources (astronomy)
- gamma ray telescopes
- spaceborne astronomy
- spaceborne telescopes
- spectral counterparts (astronomy)
- ultraviolet telescopes
- x ray telescopes

### swimming

RT physical exercise  
physical fitness

### swimming pool reactors

- GS nuclear reactors
  - . liquid cooled reactors
  - . . water cooled reactors
  - . . . **swimming pool reactors**
- RT ∞ reactors

### swine

- SN (EXCLUDES GUINEA PIGS)
- UF *pigs (swine)*
- GS animals
  - . vertebrates
  - . . mammals
  - . . . **swine**
- RT grazing
- livestock

### swing tail assemblies

- GS assemblies
  - . tail assemblies
  - . . **swing tail assemblies**
- RT afterbodies
- aircraft parts
- aircraft structures

### swing wings

- GS airfoils
  - . wings
  - . . **swing wings**
- RT aircraft parts
- aircraft structures
- wing planforms

wing profiles

### swingby technique

- UF *gravity assist trajectories*
- RT Comet Nucleus Tour
- flyby missions
- gravitational effects
- interplanetary transfer orbits
- orbital mechanics
- planetary orbits
- round trip trajectories
- spacecraft trajectories

### swirling

- RT agitation
- centrifuging
- dispersing
- foaming
- mixing
- ∞ separation
- shaking
- stirring

*swirling wakes*

USE **turbulent wakes**

### Swiss space program

- GS programs
  - . space programs
  - . . European space programs
  - . . . **Swiss space program**
- RT Switzerland

### switches

- GS **switches**
  - . capacitance switches
  - . electric relays
  - . electric switches
  - . . cryotrons
  - . . stepping switches
  - . . thermostats
  - . . vacuum arc switches
  - . pressure switches
  - . switching circuits
  - . . fluid switching elements
  - . . . trigatrons
- RT circuit breakers
- dropouts
- echo suppressors
- electric connectors
- electric contacts
- interruption
- selectors
- switching

### switching

- GS **switching**
  - . beam switching
  - . magnetic switching
  - . microwave switching
  - . optical switching
  - . packet switching
- RT code division multiple access
- interruption
- sequencing
- step recovery diodes
- switches
- time division multiple access

### switching circuits

- UF *electronic switches*
- switching elements*
- GS circuits
  - . **switching circuits**
  - . . fluid switching elements
  - switches
  - . **switching circuits**
  - . . fluid switching elements
- RT ARPA computer network
- capacitance switches
- cascode devices
- circuit breakers
- current regulators
- duplex operation
- duplexers
- electric relays
- electric switches
- gates (circuits)
- latch-up
- logic circuits

matrices (circuits)

- microwave switching
- multivibrators
- optical bistability
- optical switching
- packet switching
- selectors
- squelch circuits
- vacuum arc switches
- voltage regulators

*switching elements*

USE **switching circuits**

### switching theory

- RT Boolean algebra
- branching (mathematics)
- communication theory
- commutation
- logic design
- network synthesis
- packet switching
- sequencing
- ∞ theories
- topology

### Switzerland

- GS nations
  - . **Switzerland**
- RT Alps Mountains (Europe)
- Europe
- Swiss space program

### swivels

- RT bearings
- gimbals
- hinges
- hooks
- joints (junctions)
- pivots

### syenite

- GS rocks
  - . igneous rocks
  - . . **syenite**
- RT soils
- trachyte

### syllables

- RT messages
- psycholinguistics
- semantics
- signal transmission

### symbiosis

DEF The intimate living together of two organisms of different species, for mutual benefit.

- RT ecology
- lichens

### sybiotic stars

- GS celestial bodies
  - . stars
  - . . double stars
  - . . . binary stars
  - . . . . **sybiotic stars**
  - . . . . . peculiar stars
  - . . . . . **sybiotic stars**
  - . . . . . **sybiotic stars**
  - . . . . . **sybiotic stars**
  - . . . . . **sybiotic stars**
- RT absorption spectra
- eclipsing binary stars
- emission spectra
- flare stars
- M stars
- novae
- stellar envelopes
- stellar mass accretion
- stellar oscillations
- stellar spectra
- stellar temperature

### symbolic programming

- GS computer programming
  - . **symbolic programming**
- RT coding
- computer assisted instruction
- context free languages
- language programming

- mnemonics
- .. . . . autonomic nervous system  
 .. . . . **sympathetic nervous system**
- RT ∞ systems
- symbols**
- UF *characters*  
*letters (symbols)*  
*signs (symbols)*
- GS **symbols**  
 . alphanumeric characters  
 . . . digits  
 . . . . . binary digits
- RT abbreviations  
 alphabets  
 character recognition
- ∞ codes  
 coding  
 color  
 data processing  
 high level languages  
 languages  
 legibility
- ∞ mathematics  
 message processing  
 messages  
 mnemonics  
 nomenclatures  
 perception  
 reading  
 semantics
- ∞ signals  
 units of measurement  
 visibility
- symmetrical bodies**
- GS **symmetrical bodies**  
 . axisymmetric bodies  
 . . . power law bodies  
 . bodies of revolution  
 . . . conical bodies  
 . . . . . slender cones  
 . . . cylindrical bodies  
 . . . . . rotating cylinders  
 . . . parabolic bodies  
 . . . power law bodies  
 . . . spheres  
 . . . . . celestial sphere  
 . . . . . concentric spheres  
 . . . . . falling spheres  
 . . . . . Poincare spheres  
 . . . . . rotating spheres  
 . . . toruses  
 . . . ellipsoids  
 . . . lenticular bodies  
 . . . streamlined bodies  
 . . . fairings
- RT axes of rotation  
 blunt bodies
- ∞ bodies  
 cones  
 finned bodies  
 flared bodies  
 geoids  
 ogives  
 slender bodies  
 spinning unguided rocket trajectory
- symmetry**
- UF *axisymmetry*
- GS **symmetry**  
 . broken symmetry  
 . . CP violation  
 . chirality  
 . supersymmetry
- RT antisymmetry  
 asymmetry  
 congruences  
 continuity (mathematics)  
 eccentricity  
 enantiomers  
 geometry  
 grand unified theory  
 isotropism  
 quantiles  
 shapes
- symmetry breaking*  
 USE **broken symmetry**
- sympathetic nervous system**
- GS anatomy  
 . nervous system
- sympathomimetics*  
 USE **adrenergics**
- Symphonie satellites**
- GS artificial satellites  
 . communication satellites  
 . . **Symphonie satellites**
- RT Arcomsat  
 broadcasting  
 European space programs  
 French satellites  
 international cooperation  
 radio transmission  
 satellite television  
 synchronous satellites  
 telephony
- symposia*  
 USE **conferences**
- symptomology**
- GS medical science  
 . **symptomology**
- RT diseases  
 signs and symptoms
- symptoms*  
 USE **signs and symptoms**
- synapses**
- RT acetylcholine  
 nerves  
 nervous system  
 neuromuscular transmission  
 neurons  
 neurotransmitters  
 syncoders
- synchrocyclotrons**
- GS particle accelerators  
 . cyclic accelerators  
 . . **synchrocyclotrons**  
 . . . cyclotrons  
 . . . **synchrocyclotrons**
- RT bevatron  
 synchrotrons
- synchronism**
- DEF The relationship between two or more periodic quantities of the same frequency when the phase difference between them is zero or constant at a predetermined value. Used for beat and synchronization.
- UF *beat*  
*synchronization*
- GS **synchronism**  
 . bit synchronization  
 . frequency synchronization  
 . time synchronization
- RT coincidence circuits  
 Dining Philosophers Problem  
 phase detectors  
 stroboscopes  
 synchronizers  
 synchrophasing  
 time  
 time measurement
- synchronization*  
 USE **synchronism**
- synchronized oscillators**
- GS oscillators  
 . **synchronized oscillators**
- RT frequency synchronization  
 phase locked systems  
 synchrosopes
- synchronizers**
- RT heliostats  
 pulse radar  
 servomotors
- synchronism
- Synchronous Communication Satellites*  
 USE **SYNCOM satellites**
- Synchronous Communications Satellite Proj**
- SN (SYNCHRONOUS COMMUNICATIONS SATELLITE PROJECT)
- GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Synchronous Communications Satellite Proj**  
 . . . projects  
 . . . **Synchronous Communications Satellite Proj**  
 . . . space programs  
 . . . NASA space programs  
 . . . . **Synchronous Communications Satellite Proj**
- RT communication satellites  
 twenty-four hour orbits
- synchronous detectors*  
 USE **correlators**
- Synchronous Earth Observatory satellite**
- UF *SEOS*
- GS artificial satellites  
 . meteorological satellites  
 . . **Synchronous Earth Observatory satellite**  
 . . . SMS 1  
 . . . SMS 2  
 . . . synchronous satellites  
 . . . **Synchronous Earth Observatory satellite**  
 . . . SMS 1  
 . . . SMS 2
- RT early warning systems  
 Landsat satellites  
 NASA programs  
 programs  
 satellite observation  
 SEASAT satellites  
 Synchronous Meteorological Satellite  
 technology utilization
- Synchronous Meteorological Satellite**
- UF *SMS*
- GS artificial satellites  
 . meteorological satellites  
 . . **Synchronous Meteorological Satellite**  
 . . . SMS 1  
 . . . SMS 2  
 . . . synchronous satellites  
 . . . **Synchronous Meteorological Satellite**  
 . . . SMS 1  
 . . . SMS 2
- RT communication satellites  
 Synchronous Earth Observatory satellite
- synchronous motors**
- GS electromechanical devices  
 . electric motors  
 . . **synchronous motors**  
 . . . motors  
 . . . electric motors  
 . . . **synchronous motors**
- RT asynchronous motors  
 induction motors
- synchronous platforms**
- DEF Space platforms whose rotation is synchronized with that of Earth. Used for geostationary platforms.
- UF *geostationary platforms*
- GS space platforms  
 . **synchronous platforms**
- RT communication satellites  
 geosynchronous orbits  
 ∞ platforms  
 synchronous satellites
- synchronous satellites**
- DEF Equatorial west-to-east satellites orbiting the Earth at an altitude of approximately



## synchrophasing

35,900 kilometers, at which they make one revolution in 24 hours, synchronous with the Earth's rotation. Used for geostationary satellites.

UF *geostationary satellites*  
GS artificial satellites  
    . **synchronous satellites**  
    . . . AEROS satellite  
    . . . Aerosat satellites  
    . . . Anik satellites  
    . . . Anik 1  
    . . . Anik 2  
    . . . Anik 3  
    . . . GOES satellites  
    . . . GOES 1  
    . . . GOES 2  
    . . . GOES 3  
    . . . GOES 4  
    . . . GOES 5  
    . . . GOES 6  
    . . . GOES 7  
    . . . GOES 8  
    . . . GOES 9  
    . . . GOES 10  
    . . . GOES 13  
    . . . Miranda satellite  
    . . . SIRIO satellite  
    . . . StormSat satellite  
    . . . Synchronous Earth Observatory satellite  
    . . . SMS 1  
    . . . SMS 2  
    . . . Synchronous Meteorological Satellite  
    . . . SMS 1  
    . . . SMS 2  
    . . . SYNCOM satellites  
    . . . Early Bird satellites  
    . . . SYNCOM 1 satellite  
    . . . SYNCOM 2 satellite  
    . . . SYNCOM 3 satellite  
    . . . SYNCOM 4 satellite  
    . . . TD satellites  
    . . . TD-1 satellite  
RT active satellites  
    Arcomsat  
    Canadian space program  
    communication satellites  
    Communications Technology Satellite  
    military spacecraft  
    navigation satellites  
    passive satellites  
    Refsat  
    stationary orbits  
    Symphonie satellites  
    synchronous platforms  
    twenty-four hour orbits

### synchrophasing

RT aircraft noise  
noise reduction  
propeller blades  
synchronism

### synchrophasotrons

GS particle accelerators  
    . **synchrophasotrons**  
RT  $\infty$  accelerators  
synchrotrons

### synchrosopes

GS circuits  
    . phase detectors  
    . . **synchrosopes**  
RT correlators  
measuring instruments  
oscilloscopes  
synchronized oscillators

### synchrotron radiation

GS electromagnetic radiation  
    . nonthermal radiation  
    . . **synchrotron radiation**  
    . polarized electromagnetic radiation  
    . . **synchrotron radiation**  
    . polarized radiation  
    . polarized electromagnetic radiation  
    . . **synchrotron radiation**  
RT bremsstrahlung  
extraterrestrial radiation

$\infty$  radiation  
radiation protection  
synchrotrons  
x rays

### synchrotrons

DEF Devices for accelerating particles, ordinarily electrons, in a circular orbit in an increasing magnetic field by means of an alternating field applied in a synchronism with the orbital motion.

GS particle accelerators  
    . cyclic accelerators  
    . . **synchrotrons**  
    . . . bevatron  
    . . . storage rings (particle accelerators)  
RT betatrons  
cyclotrons  
electron accelerators  
ion accelerators  
microtrons  
synchrocyclotrons  
synchrophasotrons  
synchrotron radiation

### synclines

UF *synclinoria*  
RT anticlines  
domes (geology)  
geological faults  
geosynclines  
 $\infty$  layers  
strata  
stratification  
stratigraphy

### synclinoria

USE **synclines**

### syncoders

RT bionics  
neurons  
synapses

### SYNCOM 1 satellite

GS artificial satellites  
    . active satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 1 satellite**  
    . communication satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 1 satellite**  
    . synchronous satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 1 satellite**  
RT Delta launch vehicle

### SYNCOM 2 satellite

GS artificial satellites  
    . active satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 2 satellite**  
    . communication satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 2 satellite**  
    . synchronous satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 2 satellite**  
RT Delta launch vehicle

### SYNCOM 3 satellite

GS artificial satellites  
    . active satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 3 satellite**  
    . communication satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 3 satellite**  
    . synchronous satellites  
    . . SYNCOM satellites  
    . . . **SYNCOM 3 satellite**  
RT Delta launch vehicle

### SYNCOM 4 satellite

DEF A geosynchronous communications satellite that was deployed on Space Shuttle STS 51A in November 1984.  
GS artificial satellites  
    . active satellites

. . . SYNCOM satellites  
. . . **SYNCOM 4 satellite**  
. . . communication satellites  
. . . SYNCOM satellites  
. . . **SYNCOM 4 satellite**  
. . . synchronous satellites  
. . . SYNCOM satellites  
. . . **SYNCOM 4 satellite**

### SYNCOM apogee engines

GS engines  
    . rocket engines  
    . . solid propellant rocket engines  
    . . . **SYNCOM apogee engines**  
    . . Vernier engines  
    . . . **SYNCOM apogee engines**  
    . torpedo engines  
    . . Vernier engines  
    . . . **SYNCOM apogee engines**

### SYNCOM satellites

UF *Synchronous Communication Satellites*  
GS artificial satellites  
    . active satellites  
    . . **SYNCOM satellites**  
    . . . Early Bird satellites  
    . . . SYNCOM 1 satellite  
    . . . SYNCOM 2 satellite  
    . . . SYNCOM 3 satellite  
    . . . SYNCOM 4 satellite  
    . communication satellites  
    . . **SYNCOM satellites**  
    . . . Early Bird satellites  
    . . . SYNCOM 1 satellite  
    . . . SYNCOM 2 satellite  
    . . . SYNCOM 3 satellite  
    . . . SYNCOM 4 satellite  
    . synchronous satellites  
    . . **SYNCOM satellites**  
    . . . Early Bird satellites  
    . . . SYNCOM 1 satellite  
    . . . SYNCOM 2 satellite  
    . . . SYNCOM 3 satellite  
    . . . SYNCOM 4 satellite  
RT Thor Delta launch vehicle

### syncope

UF *fainting*  
GS **syncope**  
    . blackout (physiology)  
    . . blackout prevention  
RT unconsciousness

### syndromes

USE **signs and symptoms**

### syngas

(added January 2002)  
USE **synthesis gas**

### synoptic measurement

RT  $\infty$  measurement  
nephanalysis

### synoptic meteorology

DEF The study and analysis of weather information gathered at the same time.

GS meteorology  
    . **synoptic meteorology**  
RT air masses  
anticyclones  
cold fronts  
cyclones  
fronts (meteorology)  
meteorological charts  
nephanalysis  
teleconnections (meteorology)  
warm fronts  
weather forecasting

### syntax

GS linguistics  
    . **syntax**  
RT format  
grammars  
 $\infty$  interpretation  
languages  
natural language processing  
orthography

parsing algorithms  
 psycholinguistics  
 semantics  
 sentences  
 speech

**syntectic alloys**

DEF Metallic composite materials characterized by a reversible convertibility of their solid phases into two liquid phases by the application of heat.

GS alloys  
 . **syntectic alloys**  
 RT eutectics  
 liquid phases  
 metals  
 phase transformations  
 solid phases

**synthane**

UF *synthetic methane*  
 GS fuels  
 . chemical fuels  
 . . hydrocarbon fuels  
 . . . **synthane**  
 . . synthetic fuels  
 . . . **synthane**  
 RT automobile fuels  
 carbon dioxide  
 carbon monoxide  
 coal  
 coal gasification  
 gasification  
 hydrogen  
 lignite  
 methane

**∞ synthesis**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT biosynthesis  
 chemical reactions  
 decision theory  
 ∞ design  
 network synthesis  
 nuclear fusion  
 operations research  
 plasma jet synthesis  
 synthesis (chemistry)  
 synthetic fuels  
 systems engineering

**synthesis (chemistry)**

DEF The application of chemical reactions to obtain desired chemical products.

GS **synthesis (chemistry)**  
 . polymerization  
 . . copolymerization  
 . . dimerization  
 . electrochemical synthesis  
 RT addition resins  
 chemical reactions  
 ∞ chemistry  
 cycloaddition  
 Fischer-Tropsch process  
 operations research  
 reaction intermediates  
 self assembly  
 ∞ synthesis  
 synthesis gas  
 synthetic fibers  
 synthetic fuels  
 synthetic resins  
 synthetic rubbers  
 systems engineering

**synthesis gas**

(added January 2002)

DEF A mixture of gases produced as feedstock for the synthesis of chemical compounds, for example, hydrogen and carbon monoxide used as the starting material for the production of ammonia derivatives, methanol, and hydrocarbons.

UF *syngas*  
 GS gases  
 . **synthesis gas**  
 RT catalysts  
 coal derived gases

coal gasification  
 fuel production  
 synthesis (chemistry)  
 synthetic fuels

**synthesizers**

RT chemical reactors  
 frequency synthesizers

**synthetic aperture radar**

DEF Active microwave sensors providing all-weather, high resolution imagery. Used for imaging radar.

GS radar  
 . **synthetic aperture radar**  
 . . Shuttle Imaging Radar  
 . . side-looking radar  
 RT airborne radar  
 Earthnet  
 Envisat-1 satellite  
 ground penetrating radar  
 imaging radar  
 Magellan spacecraft (NASA)  
 microwave imagery  
 microwave sensors  
 radar equipment  
 Radarsat  
 satellite-borne radar  
 surveillance radar  
 synthetic apertures  
 Venus orbiting imaging radar  
 (spacecraft)

**synthetic apertures**

DEF In radar technology, the simulations of large antennas by correcting the phase and magnitude of the return signals from smaller antennas, permitting the use of lower frequencies for airborne radars.

GS openings  
 . apertures  
 . . **synthetic apertures**  
 RT imaging techniques  
 synthetic aperture radar

**synthetic arrays**

GS arrays  
 . **synthetic arrays**  
 RT antenna radiation patterns  
 apertures  
 distribution (property)  
 ∞ patterns  
 Shuttle Imaging Radar

**synthetic fibers**

GS fibers  
 . **synthetic fibers**  
 . . aramid fibers  
 . . . Kevlar (trademark)  
 . . ceramic fibers  
 . . Dacron (trademark)  
 . . Fortisan (trademark)  
 . . glass fibers  
 . . Nylon (trademark)  
 . . rayon  
 . . Vycor  
 RT addition resins  
 flame retardants  
 Kevlar (trademark)  
 polyacrylonitrile  
 polybenzimidazole  
 polyesters  
 reinforcing fibers  
 synthesis (chemistry)  
 wet spinning

**synthetic food**

DEF Mixture of roughage, vitamins, minerals, etc., closely approximating natural foods in appearance, taste, and nutrition.

RT amino acids  
 biosynthesis  
 carbohydrates  
 cellulose  
 eating  
 fats  
 ∞ food  
 food intake  
 nutritional requirements  
 protein metabolism

proteins  
 taste

**synthetic fuels**

GS fuels  
 . chemical fuels  
 . . **synthetic fuels**  
 . . . gasohol (fuel)  
 . . . synthane  
 RT chemical reactions  
 clean fuels  
 Fischer-Tropsch process  
 hydrocarbon fuels  
 liquid fuels  
 ∞ synthesis  
 synthesis (chemistry)  
 synthesis gas

**synthetic metals**

DEF Materials which do not occur in nature but have the appearance and physical properties of true metals.

RT crystal lattices  
 dendrimers  
 graphite  
 organometallic compounds

*synthetic methane*

USE **synthane**

**synthetic resins**

GS plastics  
 . **synthetic resins**  
 . . addition resins  
 . . . acrylic resins  
 . . . vinyl copolymers  
 . . polyester resins  
 . . polyether resins  
 . . . PEEK  
 . . . polymethyl methacrylate  
 . . thermoplastic resins  
 . . . PEEK  
 . . . quinoxalines  
 . . . thermoplastic films  
 . . thermosetting resins  
 . . . epoxy resins  
 . . . phenolic epoxy resins  
 . . . furan resins  
 . . . . polyamide resins  
 . . . . . Kevlar (trademark)  
 . . . . . Nylon (trademark)  
 . . . phenolic resins  
 . . . . micarta  
 . . . . phenolic epoxy resins  
 resins  
 . **synthetic resins**  
 . . addition resins  
 . . . acrylic resins  
 . . . vinyl copolymers  
 . . polyester resins  
 . . polyether resins  
 . . . PEEK  
 . . . polymethyl methacrylate  
 . . thermoplastic resins  
 . . . PEEK  
 . . . quinoxalines  
 . . . thermoplastic films  
 . . thermosetting resins  
 . . . epoxy resins  
 . . . phenolic epoxy resins  
 . . . furan resins  
 . . . . polyamide resins  
 . . . . . Kevlar (trademark)  
 . . . . . Nylon (trademark)  
 . . . phenolic resins  
 . . . . micarta  
 . . . . phenolic epoxy resins  
 RT polyethylenes  
 ∞ polymers  
 polypropylene  
 polystyrene  
 polytetrafluoroethylene  
 polyvinyl alcohol  
 polyvinyl chloride  
 synthesis (chemistry)  
 teflon (trademark)

**synthetic rubbers**

GS elastomers  
 . rubber

.. **synthetic rubbers**  
 ... Adiprene (trademark)  
 ... Buna (trademark)  
 ... silicone rubber  
 ... RTV-40 rubber (trademark)  
 ... RTV-60 rubber (trademark)  
 ... Viton rubber (trademark)  
 ... vulcanized elastomers  
 ... RTV-40 rubber (trademark)  
 ... RTV-60 rubber (trademark)  
 ... chloroprene resins

RT latex  
 polybutadiene  
 polyisobutylene  
 polyisoprenes  
 solithanes  
 synthesis (chemistry)

*synthetic vision*  
 USE **enhanced vision**

**syntony**  
 DEF The situation of two or more oscillating circuits having the same resonant frequency.  
 RT frequency synchronization  
 oscillations  
 resonance

**syphilis**  
 GS diseases  
 . infectious diseases  
 .. bacterial diseases  
 ... **syphilis**

**Syria**  
 GS nations  
 . **Syria**  
 RT Asia

**syringes**  
 GS laboratory equipment  
 . **syringes**  
 medical equipment  
 . **syringes**  
 RT bulbs  
 ∞ equipment  
 fluid flow  
 pipes (tubes)  
 transfusion

*System 10 computer*  
 USE **PDP 10 computer**

**system effectiveness**  
 GS effectiveness  
 . **system effectiveness**  
 RT modulation transfer function  
 optical transfer function  
 reliability  
 reliability engineering  
 ∞ systems  
 systems engineering  
 systems health monitoring  
 systems integration

**system failures**  
 GS failure  
 . **system failures**  
 RT ∞ breakdown  
 deterioration  
 downtime  
 fatigue (materials)  
 fault detection  
 malfunctions  
 short circuits  
 structural failure  
 structural strain  
 ∞ systems  
 wear

**system generated electromagnetic pulses**  
 DEF Electromagnetic fields generated by the emission of a large electronic current from a metallic body in space caused by the incidence on its surface of strong ionizing radiation pulses (usually x ray) from space. Used for SGEMP.  
 UF **SGEMP**  
 GS electromagnetic fields  
 . **system generated electromagnetic pulses**

electromagnetic radiation  
 . electromagnetic pulses  
 .. **system generated electromagnetic pulses**  
 pulsed radiation  
 . electromagnetic pulses  
 .. **system generated electromagnetic pulses**  
 pulses  
 . electromagnetic pulses  
 .. **system generated electromagnetic pulses**

RT electric current  
 electric pulses  
 electromagnetic interference  
 electronic equipment  
 external surface currents  
 extraterrestrial radiation  
 ionizing radiation  
 plasma sheaths  
 satellite communication  
 spacecraft charging  
 spacecraft communication  
 x rays

**system identification**  
 DEF The technology of modeling plants and processes from their dynamic response.  
 GS estimating  
 . **system identification**  
 identifying  
 . **system identification**  
 systems analysis  
 . **system identification**  
 RT complex systems  
 control systems design  
 dynamic response  
 estimates  
 fuzzy systems  
 mathematical models  
 maximum likelihood estimates  
 observability (systems)  
 optimization  
 parameter identification  
 parameterization  
 prediction analysis techniques  
 probability theory  
 reliability engineering  
 statistical analysis  
 steepest descent method  
 ∞ systems  
 systems engineering

**systematic errors**  
*(added April 1997)*  
 DEF Non-random and often predictable errors due to some physical law or caused by flaws in a measurement process.  
 GS errors  
 . **systematic errors**  
 RT error analysis  
 instrument compensation  
 instrument errors  
 random errors

∞ **systems**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT Advanced Vidicon Camera System (AVCS)  
 aerospace systems  
 afferent nervous systems  
 African rift system  
 air cushion landing systems  
 Airborne Integrated Reconnaissance System  
 aircraft fuel systems  
 aircraft hydraulic systems  
 all-weather landing systems  
 Aloha system  
 annular suspension and pointing system  
 Apollo extension system  
 ascent propulsion systems  
 Astroguide Navigation System  
 Atmospheric & Oceanographic Inform Sys  
 automated pilot advisory system  
 automated radar terminal system

automatic traffic advisory and resolution  
 autonomic nervous system  
 Ballistic Missile Early Warning System  
 Beacon Collision Avoidance System  
 binary systems (materials)  
 Bioastronautical Orbital Space System  
 biocontrol systems  
 cardiovascular system  
 celestial reference systems  
 Central Electronic Management System  
 central nervous system  
 central nervous system depressants  
 central nervous system stimulants  
 chokes (fuel systems)  
 closed ecological systems  
 complex systems  
 computer systems design  
 computer systems performance  
 computer systems programs  
 computer systems simulation  
 cooling systems  
 cybernetics  
 data base management systems  
 data systems  
 Defense Communications Satellite System  
 defense communications system (DCS)  
 descent propulsion systems  
 digestive system  
 digital command systems  
 digital systems  
 discrete address beacon system  
 disk operating system (DOS)  
 display devices  
 distributed parameter systems  
 domestic satellite communications systems  
 early warning systems  
 Earth Resources Information System  
 Earth terminal measurement system  
 Earth-Moon system  
 ecosystems  
 efferent nervous systems  
 EISCAT radar system (Europe)  
 ∞ elastic systems  
 electronic recording systems  
 emergency life sustaining systems  
 endocrine systems  
 end-to-end data systems  
 escape systems  
 exhaust systems  
 fail-safe systems  
 feed systems  
 feedback  
 Fleet Satellite Communication System  
 fuel systems  
 fuzzy systems  
 gastrointestinal system  
 genitourinary system  
 Global Positioning System  
 Goddard Trajectory Determination System  
 ground operational support system  
 ground support systems  
 guidance (motion)  
 hardening (systems)  
 hematopoietic system  
 hybrid navigation systems  
 hydraulic equipment  
 hydroplanes (surfaces)  
 hydrothermal systems  
 ∞ hyperbolic systems  
 IFF systems (identification)  
 ignition systems  
 IMLSS  
 inertial reference systems  
 information adaptive system  
 information systems  
 instrument landing systems  
 intake systems  
 integrated energy systems  
 integrated global ocean station systems  
 International System of Units  
 intravascular system

jettison systems  
 launch escape systems  
 life support systems  
 Light Airborne Multipurpose System  
 linear systems  
 LOCATES system  
 LORAC navigation system  
 lubrication systems  
 lumped parameter systems  
 Lunar Exploration System for Apollo  
 man machine systems  
 man operated propulsion systems  
 management information systems  
 management systems  
 metal-gas systems  
 methoxy systems  
 microwave landing systems  
 microwave scanning beam landing system  
 MIMO (control systems)  
 minitrack system  
 Miros system  
 missile systems  
 Modular Integrated Utility System  
 musculoskeletal system  
 NASA Interactive Planning System  
 National Airspace Utilization System  
 National Aviation System  
 National Oceanic Satellite System  
 navigation  
 needs (data system)  
 nervous system  
 Nike X systems  
 NOESS  
 nonlinear systems  
 Nova Laser System  
 observability (systems)  
 Omega Navigation System  
 on-line systems  
 operating systems (computers)  
 optical relay systems  
 payload deployment & retrieval system  
 peripheral nervous system  
 phase locked systems  
 piggyback systems  
 planetary systems  
 PLAT system  
 pneumatic equipment  
 pointing control systems  
 polystation doppler tracking system  
 portable life support systems  
 post boost propulsion system  
 propulsion system configurations  
 propulsion system performance  
 public address systems  
 quality control  
 radio relay systems  
 Ranger block 3 television system  
 rapid transit systems  
 ∞ reference systems  
 remote manipulator system  
 reproductive systems  
 respiratory system  
 rotor systems research aircraft  
 Safeguard system  
 SAGE air defense system  
 satellite navigation systems  
 self adaptive control systems  
 self organizing systems  
 Sentinel system  
 Shiva laser system  
 SISO (control systems)  
 SNAP  
 solar system  
 solar total energy systems  
 space detection and tracking system  
 space transportation system  
 Space Transportation System flights  
 support systems  
 suspension systems (vehicles)  
 sympathetic nervous system  
 system effectiveness  
 system failures  
 system identification  
 systems analysis  
 systems engineering  
 systems integration  
 systems management

systems simulation  
 systems stability  
 telecommunication  
 telegraph systems  
 teletypewriter systems  
 television systems  
 TERCOM  
 ternary systems  
 TIROS operational satellite system  
 total energy systems  
 TRADEX radar system  
 transcontinental systems  
 transfer functions  
 transoceanic systems  
 Typhon weapon system  
 uncertain systems  
 unmanned aircraft systems  
 vacuum systems  
 variable mass systems  
 vortex advisory system  
 warning systems  
 weapon system management  
 weapon systems

**systems analysis**

GS **systems analysis**  
 . system identification  
 RT ∞ analyzing  
 block diagrams  
 bond graphs  
 complex systems  
 computer programming  
 computer systems programs  
 computer systems simulation  
 control systems design  
 feasibility analysis  
 fuzzy systems  
 man machine systems  
 mathematical models  
 modulation transfer function  
 observability (systems)  
 operating costs  
 operations research  
 optical transfer function  
 parameter identification  
 preflight analysis  
 procedures  
 program verification (computers)  
 sensitivity analysis  
 simulation  
 sociology  
 statistical analysis  
 ∞ systems  
 trajectory analysis  
 weight analysis  
 weight reduction

**systems compatibility**

GS compatibility  
 . **systems compatibility**  
 RT interoperability  
 reliability  
 reliability engineering

*systems design*

USE **systems engineering**

**systems engineering**

DEF The process of applying science and technology to the study and planning of a system so that the relationships of various parts of the system and the use of various subsystems are fully established before designs are committed.

UF *systems design*  
 GS **systems engineering**  
 . computer systems design  
 . control systems design  
 RT aerospace systems  
 aircraft design  
 ∞ automation  
 bionics  
 bond graphs  
 communicating  
 concurrent engineering  
 contract management  
 ∞ control  
 critical path method  
 cybernetics  
 data processing

decision making  
 decision theory  
 ∞ design  
 design optimization  
 electrical engineering  
 ∞ engineering  
 experiment design  
 flight management systems  
 forecasting  
 functional design specifications  
 human factors engineering  
 information theory  
 life cycle costs  
 man machine systems  
 management  
 management planning  
 mathematical models  
 mechanization  
 missile design  
 modularity  
 multidisciplinary design optimization  
 observability (systems)  
 operational problems  
 ∞ operations  
 operations research  
 optical transfer function  
 orbit spectrum utilization  
 parameter identification  
 reliability  
 reliability engineering  
 research and development  
 reverse engineering  
 satellite design  
 software engineering  
 spacecraft design  
 statistical analysis  
 ∞ statistics  
 ∞ synthesis  
 synthesis (chemistry)  
 system effectiveness  
 system identification  
 ∞ systems  
 systems integration

*Systems for Nuclear Auxiliary Power*  
 USE **SNAP**

**systems health monitoring**

(added July 1995)  
 SN ((NOT USED FOR PHYSIOLOGICAL, PSYCHOLOGICAL, OR BIOLOGICAL SYSTEMS))  
 UF *health and usage monitoring systems*  
 RT component reliability  
 engine monitoring instruments  
 expert systems  
 fault detection  
 life (durability)  
 propulsion system performance  
 service life  
 smart structures  
 software reliability  
 structural health monitoring  
 system effectiveness

**systems integration**

DEF The combining of subsystems each with numerous interfaces for the input and output of data and each with specified functions vital to the planned success of the main system.  
 RT airborne/spaceborne computers  
 avionics  
 control systems design  
 digital systems  
 interoperability  
 system effectiveness  
 ∞ systems  
 systems engineering  
 systems simulation  
 systems-on-a-chip

**systems management**

GS management  
 . **systems management**  
 RT industrial management  
 information systems  
 man machine systems  
 management methods  
 operations research

## systems simulation

∞ systems

### systems simulation

DEF The simulation of any dynamic system.

GS simulation

. **systems simulation**

. . computer systems simulation

RT

analog simulation

computerized simulation

dynamic models

dynamical systems

flight simulation

hardware-in-the-loop simulation

mathematical models

model reference adaptive control

operations research

∞ systems

systems integration

### systems stability

GS stability

. **systems stability**

RT

control stability

dynamic stability

equations of motion

∞ equilibrium

flow stability

loop transfer recovery

MIMO (control systems)

SISO (control systems)

∞ systems

unsteady state

### systems-on-a-chip

(added May 2001)

DEF Single electronic chips that incorporate the multiple functional elements comprising a complete system; usually include processor core, I/O subsystems, and memory elements, and may include mixed-signal and mixed-technology subsystems.

UF *SOAC (electronics)*

*SoC (microelectronics)*

GS chips (electronics)

. **systems-on-a-chip**

RT application specific integrated circuits

lab-on-a-chip devices

large scale integration

microelectronics

microminiaturized electronic devices

microoptoelectromechanical systems

RISC processors

systems integration

### systole

GS heart function

. **systole**

rates (per time)

. **systole**

RT blood flow

blood pressure

cardiac ventricles

cardiovascular system

diastole

heart rate

systolic pressure

### systolic arrays

GS arrays

. **systolic arrays**

RT algorithms

architecture (computers)

chips (electronics)

computation

parallel processing (computers)

very large scale integration

### systolic pressure

GS pressure

. blood pressure

. . **systolic pressure**

RT systole

### S-Z effect

(added July 2000)

USE **Sunyaev-Zeldovich effect**

# T

## T shape

- UF *tee*
- GS shapes
  - . **T shape**
- RT beams (supports)

## T tail surfaces

- GS assemblies
  - . tail assemblies
  - . . **T tail surfaces**
  - tail surfaces
    - . **T tail surfaces**
- RT control surfaces
  - stabilizers (fluid dynamics)
- ∞ surfaces
  - sweptback tail surfaces

## T Tauri stars

- GS celestial bodies
  - . stars
  - . . protostars
  - . . . pre-main sequence stars
  - . . . . **T Tauri stars**
  - . . . . . variable stars
  - . . . . . **T Tauri stars**
- RT Herbig-Haro objects
  - star formation
  - Taurus constellation

## T-2 aircraft

- UF *buckeye aircraft*
  - T2J aircraft*
  - YT-2 aircraft*
- GS attack aircraft
  - . **T-2 aircraft**
  - jet aircraft
    - . **T-2 aircraft**
  - monoplanes
    - . **T-2 aircraft**
  - North American aircraft
    - . **T-2 aircraft**
  - single engine aircraft
    - . **T-2 aircraft**
  - training aircraft
    - . **T-2 aircraft**
- RT ∞ aircraft

## T2J aircraft

- USE **T-2 aircraft**

## T3J aircraft

- USE **T-39 aircraft**

## T-28 aircraft

- UF *Trojan aircraft*
- GS monoplanes
  - . **T-28 aircraft**
  - North American aircraft
    - . **T-28 aircraft**
  - single engine aircraft
    - . **T-28 aircraft**
  - training aircraft
    - . **T-28 aircraft**
- RT ∞ aircraft

## T-33 aircraft

- UF *F-80 aircraft*
  - Shooting Star aircraft*
- GS jet aircraft
  - . **T-33 aircraft**
  - Lockheed aircraft
    - . **T-33 aircraft**
  - monoplanes
    - . **T-33 aircraft**
  - single engine aircraft
    - . **T-33 aircraft**
  - training aircraft
    - . **T-33 aircraft**
- RT ∞ aircraft

## T-34 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-34 engine**
  - . aircraft engines

- . . **T-34 engine**
- . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-34 engine**
  - . turbine engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . turbojet engines
    - . . . . . turboprop engines
    - . . . . . **T-34 engine**
- RT C-133 aircraft

## T-37 aircraft

- GS Cessna aircraft
  - . **T-37 aircraft**
  - jet aircraft
    - . **T-37 aircraft**
  - monoplanes
    - . **T-37 aircraft**
  - training aircraft
    - . **T-37 aircraft**
- RT A-37 aircraft
  - ∞ aircraft

## T-38 aircraft

- UF *Talon aircraft*
- GS jet aircraft
  - . **T-38 aircraft**
  - monoplanes
    - . **T-38 aircraft**
  - Northrop aircraft
    - . **T-38 aircraft**
  - supersonic aircraft
    - . **T-38 aircraft**
  - training aircraft
    - . **T-38 aircraft**
- RT ∞ aircraft

## T-38 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-38 engine**
  - . aircraft engines
    - . . **T-38 engine**
    - . internal combustion engines
      - . . gas turbine engines
      - . . . jet engines
      - . . . . turbojet engines
      - . . . . . turboprop engines
      - . . . . . **T-38 engine**
    - . turbine engines
      - . . gas turbine engines
      - . . . jet engines
      - . . . . turbojet engines
      - . . . . . turboprop engines
      - . . . . . **T-38 engine**

## T-39 aircraft

- UF *Sabreliner aircraft*
  - T3J aircraft*
- GS jet aircraft
  - . **T-39 aircraft**
  - monoplanes
    - . **T-39 aircraft**
  - North American aircraft
    - . **T-39 aircraft**
  - passenger aircraft
    - . **T-39 aircraft**
  - training aircraft
    - . **T-39 aircraft**
  - utility aircraft
    - . **T-39 aircraft**
- RT ∞ aircraft
  - cargo aircraft

## T-53 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines

- . . . . . **T-53 engine**
- . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-53 engine**
  - . turbine engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . turbojet engines
    - . . . . . turboprop engines
    - . . . . . **T-53 engine**
- RT helicopter engines

## T-55 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-55 engine**
  - . aircraft engines
    - . . **T-55 engine**
    - . internal combustion engines
      - . . gas turbine engines
      - . . . jet engines
      - . . . . turbojet engines
      - . . . . . turboprop engines
      - . . . . . **T-55 engine**
    - . turbine engines
      - . . gas turbine engines
      - . . . jet engines
      - . . . . turbojet engines
      - . . . . . turboprop engines
      - . . . . . **T-55 engine**
- RT helicopter engines

## T-56 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-56 engine**
  - . internal combustion engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . turbojet engines
    - . . . . . turboprop engines
    - . . . . . **T-56 engine**
  - . turbine engines
    - . . gas turbine engines
    - . . . jet engines
    - . . . . turbojet engines
    - . . . . . turboprop engines
    - . . . . . **T-56 engine**
- RT C-130 aircraft

## T-58 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . **T-58 engine**
  - . internal combustion engines
    - . . gas turbine engines
    - . . . **T-58 engine**
    - . turbine engines
      - . . gas turbine engines
      - . . . **T-58 engine**
  - RT aircraft engines
    - helicopter engines
    - vertical takeoff aircraft

## T-63 engine

- GS engines
  - . air breathing engines
  - . . gas turbine engines
  - . . . jet engines
  - . . . . turbojet engines
  - . . . . . turboprop engines
  - . . . . . **T-63 engine**
  - . aircraft engines
    - . . **T-63 engine**
    - . internal combustion engines
      - . . gas turbine engines

## T-64 engine

- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-63 engine**
- . turbine engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-63 engine**

RT helicopter engines

## T-64 engine

GS engines

- . air breathing engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-64 engine**
- . internal combustion engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-64 engine**
- . turbine engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-64 engine**

RT helicopter engines

## T-74 engine

GS engines

- . air breathing engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-74 engine**
- . internal combustion engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-74 engine**
- . turbine engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-74 engine**

RT helicopter engines

## T-76 engine

GS engines

- . air breathing engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-76 engine**
- . aircraft engines
  - . . **T-76 engine**
- . internal combustion engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-76 engine**
- . turbine engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-76 engine**

RT helicopter engines

## T-78 engine

GS engines

- . air breathing engines
- . . gas turbine engines
- . . . jet engines
  - . . . . turbojet engines
  - . . . . turboprop engines
  - . . . . . **T-78 engine**
- . aircraft engines
  - . . **T-78 engine**

- . internal combustion engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-78 engine**
- . turbine engines
  - . . gas turbine engines
  - . . . jet engines
    - . . . . turbojet engines
    - . . . . turboprop engines
    - . . . . . **T-78 engine**

## tables (data)

DEF (1) An array of data, each item of which may be unambiguously identified by means of one or more arguments. (2) A collection of data in which each item is uniquely identified by a label, by its position relative to the other items, or by some other means.

GS **tables (data)**

- . conversion tables
- . interference factor table
- . mathematical tables

RT air data systems  
astronomical catalogs

∞ data  
data acquisition  
data management  
data processing  
data recording  
data reduction  
data retrieval  
printouts  
spreadsheets  
statistical analysis

∞ statistics  
∞ tabulation  
tabulation processes

## tablets

RT briquets

∞ capsules  
molds

## tabs (control surfaces)

GS airfoils

- . **tabs (control surfaces)**  
control surfaces
- . **tabs (control surfaces)**

RT aerial rudders  
ailerons

∞ control  
elevators (control surfaces)  
elevons  
rudders  
stabilizers (fluid dynamics)

∞ surfaces

## tabulating

USE **tabulation processes**

## ∞ tabulation

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT tables (data)  
tabulation processes

## tabulation processes

UF *tabulating*

RT data processing  
data recording  
tables (data)

∞ tabulation

## Tacan

DEF A two dimensional navigation system which provides azimuth and distance to a fixed ground station for navigation in piloted aircraft. Used for tactical air navigation.

UF *tactical air navigation*

GS navigation

- . radio navigation
- . . **Tacan**

RT air navigation  
all-weather air navigation  
flight paths  
navigation aids  
radar navigation

solar compasses

## tachistoscopes

RT visual perception

## tachometers

GS display devices

- . speed indicators
- . . **tachometers**  
measuring instruments
- . indicating instruments
- . . speed indicators
- . . . **tachometers**

RT aircraft instruments  
angular velocity  
timing devices  
velocity measurement

## tachycardia

GS diseases

- . **tachycardia**  
rates (per time)
- . heart rate
- . . **tachycardia**

## tachyons

GS particles

- . elementary particles
- . . hypothetical particles
- . . . **tachyons**

## tachypnea

GS rates (per time)

- . respiratory rate
- . . **tachypnea**

## tackiness

RT adhesion

## TACT program

UF *Transonic Aircraft Technology Program*

GS programs

- . NASA programs
- . . **TACT program**

RT ∞ aeronautics  
∞ aircraft

## tactical air navigation

USE **Tacan**

## tactics

RT attacking (assaulting)  
deployment  
evasive actions  
military operations  
military technology  
obstacle avoidance

## tactile discrimination

GS discrimination

- . sensory discrimination
- . . **tactile discrimination**  
perception
- . sensory perception
- . . touch
- . . . **tactile discrimination**

RT tactile sensors (robotics)

## tactile sensation

USE **touch**

## tactile sensors (robotics)

(added January 1991)

GS robot sensors

- . **tactile sensors (robotics)**

RT end effectors  
manipulators  
robots

∞ sensors  
servomechanisms  
tactile discrimination  
teleoperators  
touch

## Tafel law

GS laws

- . **Tafel law**

RT electrodes  
electrolysis  
Ficks equation

polarization (charge separation)

#### tagging

USE **marking**

#### TAGN

UF *triaminoguanidinenitrate*  
 GS oxidizers  
 . rocket oxidizers  
 . . **TAGN**  
 propellants  
 . rocket propellants  
 . . **TAGN**  
 RT explosives

#### Taguchi methods

(*added September 2000*)  
 DEF Quality engineering methodology, developed by Genichi Taguchi, for minimizing a product's sensitivity to uncontrollable system disturbances by simultaneously varying both design and disturbance parameters. The method incorporates a special set of arrays called orthogonal arrays that define the minimal number of experiments that would provide the full information for all factors that affect the performance parameter.

GS quality control  
 . **Taguchi methods**  
 RT design analysis  
 experiment design  
 multidisciplinary design optimization  
 optimization  
 parameter identification  
 reliability engineering  
 statistical analysis  
 total quality management

#### tail assemblies

DEF The rear part of a body, as of an aircraft or a rocket. The tail surfaces of an aircraft or rocket. Used for empennage, tail mountings, tails (assemblies), and vertical tails.

UF *empennage*  
*tail mountings*  
*tails (assemblies)*  
*vertical tails*

GS assemblies  
 . **tail assemblies**  
 . . horizontal tail surfaces  
 . . sweptback tail surfaces  
 . . swing tail assemblies  
 . . T tail surfaces  
 . . trapezoidal tail surfaces

RT aerial rudders  
 afterbodies  
 aircraft parts  
 aircraft structures  
 airfoils  
 airframes  
 boattails  
 body-wing and tail configurations  
 ∞ boom  
 control surfaces  
 elevators (control surfaces)  
 fins  
 hydrofoils  
 marine rudders  
 missile structures  
 rudders  
 sails  
 stabilizers (fluid dynamics)  
 vanes

#### tail mountings

USE **tail assemblies**

#### tail planes

USE **horizontal tail surfaces**

#### tail rotors

GS rotating bodies  
 . rotors  
 . . **tail rotors**  
 . . . helicopter tail rotors  
 RT helicopter control  
 rotary wings

∞ rotor blades

#### tail surfaces

GS **tail surfaces**  
 . horizontal tail surfaces  
 . sweptback tail surfaces  
 . T tail surfaces  
 . trapezoidal tail surfaces  
 RT control surfaces  
 elevators (control surfaces)  
 rudders  
 stabilizers (fluid dynamics)  
 ∞ surfaces

#### tailless aircraft

UF *flying wing aircraft*  
 GS **tailless aircraft**  
 . AVRO 707 aircraft  
 . B-58 aircraft  
 . F-102 aircraft  
 . F-106 aircraft  
 . FD 2 aircraft  
 . HP-115 aircraft  
 . Mirage 3 aircraft  
 . SC-1 aircraft  
 . Vulcan aircraft  
 . X-36 aircraft  
 . X-45 aircraft  
 RT ∞ aircraft  
 blended-wing-body configurations  
 jet aircraft  
 ∞ low wing aircraft  
 ∞ military aircraft  
 monoplanes  
 research aircraft

#### tailoring

USE **design**

#### tails (assemblies)

USE **tail assemblies**

#### Taiwan

UF *Republic of China*  
 GS nations  
 . **Taiwan**  
 RT Asia  
 China  
 Chinese space program  
 Chinese spacecraft  
 Hong Kong

#### Tajikistan

(*added August 1993*)  
 GS nations  
 . **Tajikistan**  
 RT Asia

#### takeoff

DEF The action of a rocket vehicle departing from its launch pad. The action of an aircraft as it becomes airborne.

GS **takeoff**  
 . vertical takeoff  
 RT air traffic control  
 ascent  
 climbing flight  
 JATO engines  
 landing  
 maneuvers  
 runways

#### takeoff runs

RT aircraft performance  
 distance  
 runway alignment  
 short takeoff aircraft

#### takeoff systems

USE **aircraft launching devices**

#### talc

UF *steatite*  
 GS magnesium compounds  
 . **talc**  
 minerals  
 . **talc**  
 silicon compounds  
 . silicates  
 . . sodium silicates

. . . **talc**  
 sodium compounds  
 . sodium silicates  
 . . **talc**

#### talking

GS speech  
 . **talking**  
 RT sentences  
 signal transmission

#### Talon aircraft

USE **T-38 aircraft**

#### Talos missile

GS missiles  
 . surface to air missiles  
 . . **Talos missile**  
 RT Bumblebee project  
 liquid propellant rocket engines  
 multistage rocket vehicles  
 solid propellant rocket engines

#### tandem mirrors

GS mirrors  
 . magnetic mirrors  
 . . **tandem mirrors**  
 RT fusion reactors  
 mirror fusion  
 plasma control  
 thermal barriers (plasma control)

#### tandem rotor helicopters

GS V/STOL aircraft  
 . rotary wing aircraft  
 . . helicopters  
 . . . **tandem rotor helicopters**  
 . . . . CH-46 helicopter  
 . . . . CH-47 helicopter  
 . . . . H-25 helicopter  
 RT ∞ aircraft

#### tandem wing aircraft

DEF An aircraft configuration having two wings of similar span, mounted in tandem.

GS **tandem wing aircraft**  
 . X-19 aircraft  
 . X-22A aircraft  
 RT ∞ aircraft  
 biplanes  
 canard configurations  
 dual wing configurations  
 jet aircraft  
 joined wings  
 research aircraft  
 ∞ subsonic aircraft  
 X-22 aircraft

#### tangential blowing

(*added October 1996*)  
 GS blowing  
 . **tangential blowing**  
 RT boundary layer control  
 chords (geometry)  
 circulation control airfoils  
 jet flaps  
 lift augmentation  
 spanwise blowing  
 wing slots

#### tangents

GS analysis (mathematics)  
 . real variables  
 . . periodic functions  
 . . . trigonometric functions  
 . . . . **tangents**  
 functions (mathematics)  
 . transcendental functions  
 . . periodic functions  
 . . . trigonometric functions  
 . . . . **tangents**  
 geometry  
 . Euclidean geometry  
 . . analytic geometry  
 . . . **tangents**  
 RT chords (geometry)

#### tangling

RT confusion  
 entrapment



## tank geometry

mixing

**tank geometry**  
GS geometry  
  . **tank geometry**  
RT liquid sloshing  
  propellant tanks  
  storage tanks  
  tanks (containers)  
  ullage

**tank trucks**  
GS surface vehicles  
  . motor vehicles  
  . . trucks  
  . . . **tank trucks**  
RT ∞ tankers  
  trailers

**tanker aircraft**  
GS transport aircraft  
  . **tanker aircraft**  
RT air to air refueling  
  ∞ aircraft  
  aircraft fuels  
  bomber aircraft  
  fuel tanks  
  ∞ military aircraft  
  ∞ tankers  
  Valiant aircraft

**tanker ships**  
GS surface vehicles  
  . cargo ships  
  . . **tanker ships**  
  water vehicles  
  . ships  
  . . cargo ships  
  . . . **tanker ships**  
RT artificial harbors  
  deepwater terminals  
  harbors  
  marine transportation  
  offshore docking  
  offshore platforms  
  shipyards  
  ∞ tankers  
  wharves

**tanker terminals**  
RT artificial harbors  
  cargo ships  
  deepwater terminals  
  marine technology  
  oceanography  
  offshore docking  
  offshore platforms  
  ship terminals  
  ∞ tankers  
  terminal facilities  
  transportation

∞ **tankers**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT artificial harbors  
  deepwater terminals  
  offshore docking  
  offshore platforms  
  tank trucks  
  tanker aircraft  
  tanker ships  
  tanker terminals  
  transportation energy

**tanks (combat vehicles)**  
GS surface vehicles  
  . **tanks (combat vehicles)**  
RT armed forces  
  military operations  
  ∞ military vehicles  
  ordnance  
  ∞ vehicles  
  weapons

**tanks (containers)**  
GS **tanks (containers)**  
  . bunkers (fuel)  
  . cylindrical tanks  
  . external tanks

. fuel tanks  
  . wing tanks  
  . cryogenic tanks  
  . propellant tanks  
  . spherical tanks  
  . storage tanks  
RT basins (containers)  
  bottles  
  chemical reactors  
  ∞ containers  
  drums (containers)  
  fluid filled shells  
  liquid filled shells  
  materials handling  
  pipe nozzles  
  pressure vessels  
  receivers  
  ∞ structures  
  tank geometry  
  towers  
  wing-fuselage stores

**tantalum**  
GS chemical elements  
  . **tantalum**  
  . . tantalum isotopes  
  metals  
  . refractory metals  
  . . **tantalum**  
  . . . tantalum isotopes  
  transition metals  
  . . **tantalum**  
  . . . tantalum isotopes  
  refractory materials  
  . refractory metals  
  . . **tantalum**  
  . . . tantalum isotopes

**tantalum alloys**  
GS alloys  
  . heat resistant alloys  
  . . refractory metal alloys  
  . . . **tantalum alloys**  
  refractory materials  
  . refractory metal alloys  
  . . **tantalum alloys**  
RT hafnium alloys

**tantalum carbides**  
GS carbon compounds  
  . carbides  
  . . **tantalum carbides**  
  tantalum compounds  
  . **tantalum carbides**

**tantalum compounds**  
GS **tantalum compounds**  
  . tantalum carbides  
  . tantalum nitrides  
  . tantalum oxides  
RT ∞ chemical compounds  
  ∞ Group 5B compounds  
  ∞ metal compounds

**tantalum isotopes**  
GS chemical elements  
  . nuclides  
  . . isotopes  
  . . . **tantalum isotopes**  
  . tantalum  
  . . **tantalum isotopes**  
  metals  
  . refractory metals  
  . . tantalum  
  . . . **tantalum isotopes**  
  transition metals  
  . . tantalum  
  . . . **tantalum isotopes**  
  refractory materials  
  . refractory metals  
  . . tantalum  
  . . . **tantalum isotopes**

**tantalum nitrides**  
GS nitrogen compounds  
  . nitrides  
  . . metal nitrides  
  . . . **tantalum nitrides**  
  tantalum compounds

. **tantalum nitrides**

**tantalum oxides**  
GS chalcogenides  
  . oxides  
  . . metal oxides  
  . . . **tantalum oxides**  
  tantalum compounds  
  . **tantalum oxides**

**Tanzania**  
GS nations  
  . **Tanzania**  
RT Africa

**tape recorders**  
UF *magnetic tape recorders*  
GS recording instruments  
  . **tape recorders**  
  . . video tape recorders  
RT data recorders  
  electronic recording systems  
  magnetic tape transports  
  magnetic tapes  
  ∞ recorders  
  recording heads

*taper*  
USE **tapering**

**tapered columns**  
GS structural members  
  . columns (supports)  
  . . **tapered columns**

*tapered wings*  
USE **swept wings**

**tapering**  
UF *taper*  
RT convergence  
  deceleration  
  ∞ reduction

∞ **tapes**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT adhesives  
  audio tapes  
  computer compatible tapes  
  fasteners  
  heat tapes  
  magnetic tapes  
  plastic tapes  
  playbacks  
  punched tapes  
  ribbons  
  seals (stoppers)  
  splicing  
  video tapes

**taps**  
RT cutters  
  drills  
  machine tools  
  tools

**tar sands**  
GS resources  
  . Earth resources  
  . . **tar sands**  
  sediments  
  . sands  
  . . **tar sands**  
  soils  
  . sands  
  . . **tar sands**  
RT distillation  
  oil exploration  
  oil fields  
  oils  
  tars

*TARE (data reduction)*  
USE **data reduction**

**target acquisition**  
DEF The process of optically, manually, mechanically, or electronically orienting tracking

systems in the direction and range to lock on a target.

- GS acquisition
  - . **target acquisition**
- RT detection
  - high alt target and background measurement
  - MATTS (systems)
  - missile detection
  - moving target indicators
  - multiple target tracking
  - sound ranging
  - surveillance
  - targets

#### target drone aircraft

- GS drone vehicles
  - . drone aircraft
  - . . **target drone aircraft**
  - . . . Firebee 2 target drone aircraft
  - . . . Jindivik target aircraft
  - . . . pilotless aircraft
  - . . . drone aircraft
  - . . . **target drone aircraft**
  - . . . . Firebee 2 target drone aircraft
  - . . . . Jindivik target aircraft
- RT ∞ aircraft
  - ∞ military aircraft
  - remotely piloted vehicles
  - targets

#### target masking

DEF Technique used in vision contrast discrimination testing involving the ratio of the luminance of a target (object) to the luminance of the background, especially when light and dark adaptation are factors.

- GS masking
  - . **target masking**
- RT countermeasures
  - stealth technology
  - targets

#### target penetration

USE **terminal ballistics**

#### target recognition

- GS detection
  - . **target recognition**
  - recognition
  - . **target recognition**
- RT discrimination
  - laser target designators
  - missile detection
  - missile signatures
  - multiple target tracking
  - multistatic radar
  - nap-of-the-earth navigation
  - radar homing missiles
  - radar signatures
  - signature analysis
  - signatures
  - stealth technology
  - surveillance
  - targets
  - TRADEX radar system

#### target simulators

- GS simulators
  - . **target simulators**
- RT computerized simulation
  - display devices
  - scene generation

#### target thickness

- GS dimensions
  - . **target thickness**
- RT particle accelerator targets
  - targets
  - thickness

#### target tracking

USE **tracking (position)**

#### targets

DEF Objects or points toward which something is directed. Objects which reflect a sufficient amount of a radiated signal to produce an echo signal on detection equipment. Used for towed targets.

- UF *towed targets*
- GS **targets**
  - . Jindivik target aircraft
  - . laser targets
  - . particle accelerator targets
  - . radar targets
  - . . radar target scatter site program
- RT Airborne Integrated Reconnaissance System
  - command and control
  - detection
  - Firebee 2 target drone aircraft
  - irradiation
  - laser target designators
  - laser target interactions
  - line of sight
  - microballoons
  - ∞ missions
  - multiple target tracking
  - radar echoes
  - Sandpiper target missile
  - surveillance
  - target acquisition
  - target drone aircraft
  - target masking
  - target recognition
  - target thickness

#### tars

- GS products
  - . petroleum products
  - . . **tars**
- RT asphalt
  - gums (substances)
  - pitch (material)
  - tar sands

#### tartar missile

- GS missiles
  - . anti-aircraft missiles
  - . . **tartar missile**
  - . surface to air missiles
  - . . **tartar missile**
- RT AJ-10 engine
  - Bumblebee project
  - solid propellant rocket engines

#### task complexity

- GS complexity
  - . **task complexity**
- RT costs
  - ∞ performance
  - quality control
  - scheduling

#### task planning (robotics)

- (added December 1990)
- GS planning
    - . **task planning (robotics)**
  - RT robotics
    - robots
    - scheduling
    - tasks
    - teleoperators
    - telerobotics

#### tasks

- UF *jobs*
- GS **tasks**
  - . auditory tasks
  - . visual tasks
- RT costs
  - crew procedures (inflight)
  - crew procedures (preflight)
  - ∞ elements
  - matrix management
  - physical work
  - projects
  - quality control
  - retraining
  - scheduling
  - task planning (robotics)
  - ∞ tests

#### Tasmania

- GS landforms
  - . islands
  - . . **Tasmania**

RT Australia

#### taste

- UF *gustatory perception*
- GS perception
  - . sensory perception
  - . . **taste**
- RT chemoreceptors
  - synthetic food

#### TATB

- UF *triaminotrinrobenzene*
- GS explosives
  - . **TATB**
  - propellants
  - . rocket propellants
  - . . **TATB**
- RT rocket oxidizers

#### Taurid meteoroids

- GS celestial bodies
  - . meteoroid showers
  - . . **Taurid meteoroids**
  - . meteoroids
  - . . **Taurid meteoroids**

#### Taurus constellation

- GS constellations
  - . **Taurus constellation**
- RT Crab nebula
- Pleiades cluster
- T Tauri stars

#### tautomers

- RT congeners
  - isomers

#### taxiing

- RT air traffic control
  - airfield surface movements
  - runways

#### taxonomy

- RT classifications
  - ∞ classifying
  - ∞ science
  - ∞ zoology

#### Taylor instability

- GS dynamic characteristics
  - . dynamic stability
  - . . motion stability
  - . . . flow stability
  - . . . . **Taylor instability**
  - . flow characteristics
  - . . flow stability
  - . . . **Taylor instability**
  - stability
  - . dynamic stability
  - . . motion stability
  - . . . flow stability
  - . . . . **Taylor instability**
- RT density distribution
  - Goertler instability
  - interface stability
  - perturbation theory
  - rotating fluids
  - two dimensional flow

#### Taylor manifest anxiety scale

- RT anxiety
  - physiological tests
  - psychological effects
  - psychological tests

#### Taylor series

- UF *Taylor theorem*
- GS analysis (mathematics)
  - . calculus
  - . . series (mathematics)
  - . . . power series
  - . . . . **Taylor series**
  - . . . . . MacLaurin series
  - . . . . . real variables
  - . . . series (mathematics)
  - . . . . power series
  - . . . . . **Taylor series**
  - . . . . . MacLaurin series

## TD satellites

RT theorems

*Taylor theorem*  
USE **Taylor series**

*Taylor-Goertler instability*  
USE **Goertler instability**

*TCG (tracking)*  
USE **transponder control group**

*TCV program*  
USE **Terminal Configured Vehicle Program**

**TD satellites**  
GS artificial satellites  
. ESA satellites  
. . . **TD satellites**  
. . . TD-1 satellite  
. synchronous satellites  
. . . **TD satellites**  
. . . TD-1 satellite  
ESA spacecraft  
. ESA satellites  
. . . **TD satellites**  
. . . TD-1 satellite

**TD-1 satellite**  
GS artificial satellites  
. ESA satellites  
. . . TD satellites  
. . . **TD-1 satellite**  
. synchronous satellites  
. . . TD satellites  
. . . **TD-1 satellite**  
ESA spacecraft  
. ESA satellites  
. . . TD satellites  
. . . **TD-1 satellite**

*TDMA*  
USE **time division multiple access**

**TDR satellites**  
DEF Orbiting communications satellites, developed by NASA to relay data from satellite sensors to groundstations and to track the satellites in orbit.  
UF *Tracking and Data Relay Satellites*  
GS artificial satellites  
. communication satellites  
. . . **TDR satellites**  
RT autonomous spacecraft clocks  
communicating  
data transmission  
radio relay systems  
satellite networks  
satellite transmission  
telecommunication  
telemetry

**TEA lasers**  
UF *transversely excited atmospheric lasers*  
GS stimulated emission devices  
. lasers  
. . . gas lasers  
. . . **TEA lasers**  
RT atmospheric lasers  
carbon dioxide lasers  
carbon monoxide lasers  
chemical lasers  
gas masers  
HF lasers  
laser modes  
pulsed lasers  
stimulated emission

*teachers*  
USE **instructors**

*teaching*  
USE **education**

**teaching machines**  
GS training devices  
. **teaching machines**  
RT learning  
machine learning

∞ machinery

**teams**  
RT bureaus (organizations)  
federations  
institutions  
organizations  
projects  
university program

**tearing**  
RT mechanical properties  
rupturing  
shredding

**tearing modes (plasmas)**  
DEF Explosive reconnections of energetic particle accelerations at high voltages in the magnetosphere during substorms.  
RT ballooning modes  
modes  
plasmas (physics)

**technetium**  
GS chemical elements  
. **technetium**  
metals  
. transition metals  
. . . **technetium**

**technetium compounds**  
GS **technetium compounds**  
. technetium fluorides  
RT ∞ chemical compounds  
∞ Group 7B compounds  
∞ metal compounds

**technetium fluorides**  
GS halogen compounds  
. fluorine compounds  
. . . fluorides  
. . . **technetium fluorides**  
. halides  
. . . fluorides  
. . . **technetium fluorides**  
. metal halides  
. . . **technetium fluorides**  
technetium compounds  
. **technetium fluorides**

**technetium isotopes**  
GS chemical elements  
. nuclides  
. . . isotopes  
. . . **technetium isotopes**  
metals  
. transition metals  
. . . **technetium isotopes**

**technical writing**  
RT abstracts  
documentation  
editing  
records  
specifications  
translating

*techniques*  
USE **methodology**

**technological forecasting**  
GS predictions  
. forecasting  
. . . **technological forecasting**  
. . . Delphi method (forecasting)  
. . . pattern method (forecasting)  
. . . probe method (forecasting)  
. . . profile method (forecasting)  
RT aerospace technology transfer  
estimating  
technology transfer

**technologies**  
GS **technologies**  
. biotechnology  
. . . tissue engineering  
. bubble technique  
. energy technology  
. . . geothermal technology  
. marine technology  
. military technology

. nanotechnology  
. reactor technology  
. small satellite technology

RT industries  
low gravity manufacturing  
manufacturing  
nucleonics  
space manufacturing  
technology assessment  
technology utilization  
urban development

**technology assessment**  
GS assessments  
. **technology assessment**  
RT Canadian space program  
Communications Technology Satellite  
Delphi method (forecasting)  
evaluation  
feasibility analysis  
industries  
manufacturing  
pattern method (forecasting)  
probe method (forecasting)  
profile method (forecasting)  
strategic materials  
technologies  
value

**technology feasibility spacecraft**  
GS unmanned spacecraft  
. **technology feasibility spacecraft**  
RT scientific satellites  
∞ spacecraft

**technology transfer**  
DEF The process of converting scientific findings from research laboratories and governmental activities into commercially viable products.  
GS **technology transfer**  
. aerospace technology transfer  
commercialization  
communicating  
communication  
documentation  
documents  
information flow  
information management  
information transfer  
reports  
selective dissemination of information  
space commercialization  
Starsite program  
technological forecasting  
technology utilization  
transferring

**technology utilization**  
GS utilization  
. **technology utilization**  
RT aerospace technology transfer  
Canadian space program  
Communications Technology Satellite  
control configured vehicles  
data products  
general overviews  
Indian space program  
industries  
information transfer  
laser applications  
manufacturing  
NASA programs  
patent applications  
research and development  
Synchronous Earth Observatory  
satellite  
technologies  
technology transfer

*tectonic movement*  
USE **tectonics**

**tectonics**  
DEF A branch of geology dealing with the broad architecture of the upper part of the Earth's crust, that is, the regional assembling of structural or deformational features, a study of their mutual relations, their origin, and their

historical evolution. Used for tectonic movement.

UF *tectonic movement*  
GS geology

**. tectonics**

RT . . neotectonics  
asthenosphere  
core-mantle boundary  
∞ depression  
Earth movements  
Earth planetary structure  
fissures (geology)  
geophysics  
plates (tectonics)  
sea floor spreading  
subduction (geology)

TED

USE **transferred electron devices**

Tedlar (trademark)

USE **polyvinyl fluoride**

tee

USE **T shape**

teetering

RT ∞ motion

teeth

SN (EXCLUDES GEAR TEETH AND OTHER MECHANICAL DEVICES)

GS anatomy  
. digestive system

RT . . **teeth**

dental calculi  
dentistry  
mastication  
mouth  
oral hygiene  
tooth diseases

teflon (trademark)

GS halogen compounds  
. fluorine compounds  
. . . fluoro compounds  
. . . difluoro compounds  
. . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
. . . fluorine organic compounds  
. . . . fluorohydrocarbons  
. . . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
. . . . fluoropolymers  
. . . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
organic compounds  
. fluorine organic compounds  
. . . fluorohydrocarbons  
. . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
. . . . fluoropolymers  
. . . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
. hydrocarbons  
. . . fluorohydrocarbons  
. . . . polytetrafluoroethylene  
. . . . . **teflon (trademark)**  
plastics  
. polytetrafluoroethylene  
. . **teflon (trademark)**

RT ∞ polymers

resins  
synthetic resins

Tektite project

GS programs  
. NASA programs  
. . . NASA space programs  
. . . . **Tektite project**  
. . . space programs  
. . . . NASA space programs  
. . . . **Tektite project**

tektites

DEF Small glassy bodies containing no crystals, composed of at least 65 percent silicon dioxide, bearing no relation to the geological formations in which they occur, and believed to be of extraterrestrial origin.

GS celestial bodies

. meteorites  
. . stony meteorites  
. . . **tektites**  
. . . . australites  
. . . . . bediasites  
RT chondrites  
coesite  
Cyrillid meteoroids  
meteoritic composition  
meteoritic microstructures  
micrometeorites  
natural satellites

telechirics

USE **remote handling**

telecommunication

DEF Any transmission, emission, or reception of signs, signals, writings, images, sounds, or information of any nature by wire, radio, visual, or electromagnetic systems.

UF *communication systems*

GS **telecommunication**

. aircraft communication  
. broadcasting  
. closed circuit television  
. color television  
. communication  
. . facsimile communication  
. . . automatic picture transmission  
. . line of sight communication  
. . optical communication  
. . . free-space optical communication  
. . ship to shore communication  
. . underwater communication  
. . voice communication  
. . . telephony  
. . quantum communication  
. data links  
. Defense Communications Satellite System  
. Fleet Satellite Communication System  
. defense communications system (DCS)  
. educational television  
. electronic mail  
. ground-air-ground communication  
. multichannel communication  
. multiple access  
. Aloha system  
. carrier sense multiple access  
. code division multiple access  
. demand assignment multiple access  
. . frequency division multiple access  
. . time division multiple access  
. packet transmission  
. . Aloha system  
. PLAT system  
. pulse communication  
. . digital spacecraft television  
. radio communication  
. . radio relay systems  
. . . code division multiple access  
. . . time division multiple access  
. . radio telegraphy  
. . radio telemetry  
. . . pulse frequency modulation  
telemetry  
. telephony  
. radiotelephones  
. single channel per carrier transmission  
. space communication  
. . extraterrestrial communication  
. . interplanetary communication  
. . lunar communication  
. . . circumlunar communication  
. . spacecraft communication  
. . . reentry communication  
. . . satellite communication  
. . spacecraft antennas  
. spacecraft television  
. . digital spacecraft television  
. . Ranger block 3 television system  
. . satellite television  
. stereotelevision  
. telemetry

. . biotelemetry  
. . P.A.C.M. telemetry  
. . PCM telemetry  
. . radio telemetry  
. . . pulse frequency modulation  
telemetry

. transoceanic communication  
. video communication  
. . video conferencing  
. teleconferencing  
. telemedicine  
. wideband communication  
. wireless communication  
. . computer conferencing  
. . HET experiment  
. . video conferencing

RT

access control  
antennas  
ARPA computer network  
automatic repeat request  
∞ channels  
code division multiplexing  
communicating  
communication networks  
communication satellites  
computers  
data compression  
data processing  
data sampling  
data transmission  
demodulation  
∞ detectors  
digital systems  
direct broadcast satellites  
electromagnetic radiation  
frequency division multiplexing  
information theory  
INMARSAT satellites  
interfaces  
interphones  
modulation  
Molniya satellites  
Morse code  
NASCOM network  
networks  
onboard equipment  
packet switching  
point to point communication  
satellite antennas  
Seafarer project  
signal detection  
signal detectors  
signal encoding  
signal transmission  
∞ signals  
∞ systems  
TDR satellites  
telegraph systems  
teletypewriter systems  
television systems  
transcontinental systems  
transmission  
transmission circuits  
transmission lines  
transmission rate (communications)  
transmitters  
transoceanic systems  
video data  
VSAT (network)  
Westar satellites  
wide area networks

teleconferencing

GS telecommunication  
. **teleconferencing**  
. . computer conferencing  
. . HET experiment  
. . video conferencing

RT

communication satellites  
conferences  
multichannel communication  
multimedia  
satellite networks  
telemedicine

teleconnections (meteorology)

DEF Statistically significant temporal correlations between meteorological parameters at widely separated points.

## telegraph systems

RT climatology  
correlation  
data correlation  
Earth atmosphere  
meteorological parameters  
meteorology  
secular variations  
significance  
spatial distribution  
statistical analysis  
statistical correlation  
synoptic meteorology  
temporal distribution

### telegraph systems

UF *telegraphy*  
RT pulse communication  
radio communication  
single channel per carrier  
transmission  
∞ systems  
telecommunication  
teleprinters  
teletypewriters  
Westar satellites

### telegraphy

USE **telegraph systems**

### telemedicine

(added May 1997)

DEF The use of telecommunication technologies as a medium for providing medical services (diagnostic, therapeutic, education, and research) by health care professionals to sites that are remote from the provider.

GS telecommunication  
. **telemedicine**  
RT aerospace medicine  
biotelemetry  
diagnosis  
medical electronics  
medical equipment  
medical science  
medical services  
teleconferencing

### telemeters

USE **telemetry**

### telemetry

DEF The science of measuring a quantity or quantities, transmitting the results to a distant station, and there interpreting, indicating, and/or recording the quantities measured. Used for telemeters.

UF *telemeters*  
GS telecommunication  
. **telemetry**  
.. biotelemetry  
.. P.A.C.M. telemetry  
.. PCM telemetry  
.. radio telemetry  
... pulse frequency modulation  
telemetry  
transmission  
. signal transmission  
.. **telemetry**  
... biotelemetry  
... P.A.C.M. telemetry  
... PCM telemetry  
... radio telemetry  
... pulse frequency modulation  
telemetry  
RT Advanced Range Instrumentation  
Aircraft  
communication equipment  
data compression  
data links  
data retrieval  
data transmission  
decommutators  
differential pulse code modulation  
in-flight monitoring  
measuring instruments  
pulse communication  
radio communication  
ship to shore communication  
signal processing

single channel per carrier  
transmission  
spiral antennas  
TDR satellites  
time division multiplexing  
trajectory measurement  
transponder control group  
weather data recorders  
wireless communication

### teleoperator maneuvering system

USE **teleoperators**

### teleoperators

DEF Remotely controlled mobility modules which incorporate sensory and manipulative subsystems for the purpose of extending the human operators skills and cognitive capabilities into hostile or remote environments.

UF *teleoperator maneuvering system*  
GS control equipment  
. **teleoperators**  
RT human factors engineering  
man machine systems  
manipulators  
remote control  
remote handling  
robotics  
tactile sensors (robotics)  
task planning (robotics)  
telerobotics  
torque sensors (robotics)

### telephones

GS **telephones**  
. radiotelephones  
RT earphones  
telephony  
utilities

### telephony

GS telecommunication  
. communication  
.. voice communication  
... **telephony**  
.. radio communication  
.. **telephony**  
transmission  
. **telephony**  
RT communication equipment  
crosstalk  
echo suppressors  
Iridium network  
radiotelephones  
single channel per carrier  
transmission  
sound transmission  
Symphonie satellites  
telephones  
verbal communication

### telephotometers

USE **telephotometry**

### telephotometry

DEF The body of principles and techniques concerned with measuring atmospheric extinction using various types of telephotometers.

Used for telephotometers.

UF *telephotometers*  
GS optical measurement  
. photometry  
.. **telephotometry**  
RT astronomical photometry  
optical measuring instruments  
photometers  
transmissometers

### teleprinters

GS printers  
. **teleprinters**  
typewriters  
. teletypewriters  
.. **teleprinters**  
RT keying  
printers (data processing)  
receivers

telegraph systems

### telerobotics

(added December 1990)

GS robotics  
. **telerobotics**  
RT manipulators  
orbital servicing  
remote control  
robot dynamics  
robots  
space tools  
task planning (robotics)  
teleoperators

### Telesat Canada 3

USE **Anik 3**

### Telesat Canada A

USE **Anik 1**

### Telesat Canada B

USE **Anik 2**

### Telesat Canada C

USE **Anik 3**

### telescopes

UF *astronomical telescopes*  
GS **telescopes**  
. celescopes  
. circumsolar telescopes  
. gamma ray telescopes  
.. Fermi Gamma-ray Space  
Telescope  
. grazing incidence telescopes  
.. GRIST (telescope)  
. heliometers  
.. pyroheliometers  
. infrared telescopes  
.. Large Deployable Reflector  
.. Space Infrared Telescope Facility  
. manned orbital telescopes  
.. Apollo telescope mount  
. particle telescopes  
. radio telescopes  
.. kilometer wave orbiting telescope  
.. Very Large Array (VLA)  
.. Very Long Baseline Array (VLBA)  
. reflecting telescopes  
.. Large Deployable Reflector  
.. Starsat telescope  
. refracting telescopes  
. Schmidt telescopes  
. spaceborne telescopes  
.. Constellation-X  
.. Fermi Gamma-ray Space  
Telescope  
.. German Infrared Laboratory  
.. Hubble Space Telescope  
.. Infrared Space Observatory (ISO)  
.. James Webb Space Telescope  
.. Large Deployable Reflector  
.. LIRTS (telescope)  
.. solar optical telescope  
.. Space Infrared Telescope Facility  
.. Starlab  
.. Starsat telescope  
.. Wide-field Infrared Survey Explorer  
.. X Ray Astrophysics Facility  
.. XMM-Newton telescope  
. spectroscopic telescopes  
.. multispectral tracking telescopes  
.. stratoscope telescopes  
. ultraviolet telescopes  
.. Starlab  
. x ray telescopes  
.. Constellation-X  
.. X Ray Astrophysics Facility  
.. XMM-Newton telescope  
RT anisoplanatism  
antennas  
astronomical observatories  
astronomy  
balloon-borne instruments  
binoculars  
Cassegrain optics  
coronagraphs  
etalons  
eyepieces

- lenses
  - mirrors
  - multi-anode microchannel arrays
  - optical coatings
  - optical equipment
  - optical measuring instruments
  - optical transfer function
  - periscopes
  - reflectors
  - Schmidt cameras
  - seeing (astronomy)
  - solar instruments
  - spaceborne astronomy
  - ultraviolet astronomy
- telescoping structures*  
USE **folding structures**
- Telesio**  
(added January 1996)  
DEF A natural satellite of Saturn orbiting at a mean distance of 294,660 kilometers.
- GS celestial bodies
    - . natural satellites
    - . . Saturn satellites
    - . . . **Telesio**
  - RT Saturn (planet)
- teletypewriter systems**
- RT facsimile communication
  - microwave transmission
  - ∞ systems
  - telecommunication
  - teletypewriters
- teletypewriters**
- GS typewriters
    - . **teletypewriters**
    - . . teleprinters
  - RT keying
  - receivers
  - telegraph systems
  - teletypewriter systems
- television cameras**
- GS optical equipment
    - . cameras
    - . . **television cameras**
    - photographic equipment
    - . cameras
    - . . **television cameras**
    - television equipment
    - . **television cameras**
  - RT camera tubes
  - closed circuit television
  - digital cameras
  - Lallemand cameras
  - optical scanners
  - orthicons
  - raster scanning
  - return beam vidicons
  - satellite television
- television equipment**
- GS **television equipment**
    - . image dissector tubes
    - . monoscopes
    - . television cameras
    - . television receivers
  - RT cathode ray tubes
  - diplexers
  - ∞ equipment
  - flying spot scanners
  - orthicons
  - picture tubes
  - video equipment
- television receivers**
- GS receivers
    - . **television receivers**
    - television equipment
    - . **television receivers**
  - RT closed circuit television
  - tuners
- television reception**
- GS signal reception
    - . **television reception**
  - RT color television
  - radio receivers
- radio reception
  - ∞ receiving
- television systems**
- GS **television systems**
    - . Advanced Vidicon Camera System (AVCS)
    - . cable television
    - . closed circuit television
    - . color television
    - . digital television
    - . . digital spacecraft television
    - . educational television
    - . high definition television
    - . PLAT system
    - . spacecraft television
    - . . digital spacecraft television
    - . . Ranger block 3 television system
    - . . satellite television
    - . stereotelevision
  - RT communication equipment
  - Earth terminals
  - facsimile communication
  - imaging techniques
  - orbit spectrum utilization
  - radio communication
  - space communication
  - ∞ systems
  - telecommunication
  - video communication
  - video conferencing
  - video data
- television transmission**
- GS transmission
    - . electromagnetic wave transmission
    - . . **television transmission**
    - . signal transmission
    - . . **television transmission**
  - RT automatic picture transmission
  - cable television
  - closed circuit television
  - color television
  - digital television
  - direct broadcast satellites
  - double sideband transmission
  - high definition television
  - line of sight communication
  - Molniya satellites
  - radio transmitters
  - satellite television
  - satellite transmission
  - single sideband transmission
  - smear
  - spacecraft television
  - sweep frequency
  - time division multiplexing
  - transmitters
  - wave propagation
- Tellegen theory*  
USE **gyrators**
- network analysis**  
**network synthesis**
- telluric currents**
- DEF Large scale surges of electric charges within the Earth's crust, associated with disturbances of the ionosphere. Used for earth currents.
  - UF *Earth currents*
  - GS electric current
    - . **telluric currents**
    - electricity
    - . geoelectricity
    - . . **telluric currents**
  - RT atmospheric electricity
  - auroral electrojets
  - dynamo theory
  - field aligned currents
  - geomagnetic micropulsations
- telluric lines**
- DEF Absorption lines in a solar spectrum produced by constituents of the atmosphere of the Earth itself rather than by gases in the outer solar atmosphere such as those responsible for the Fraunhofer lines.
  - GS spectra
    - . radiation spectra
    - . . absorption spectra
    - . . . **telluric lines**
    - . . electromagnetic spectra
    - . . . line spectra
    - . . . . **telluric lines**
    - . spectral bands
    - . . absorption spectra
    - . . . **telluric lines**
  - RT H lines
- tellurides**
- GS chalcogenides
    - . **tellurides**
    - . . bismuth tellurides
    - . . cadmium tellurides
    - . . indium tellurides
    - . . lanthanum tellurides
    - . . lead tellurides
    - . . mercury tellurides
    - . . . mercury cadmium tellurides
    - . . tin tellurides
    - . . zinc tellurides
  - tellurium compounds
    - . **tellurides**
    - . . bismuth tellurides
    - . . cadmium tellurides
    - . . indium tellurides
    - . . lanthanum tellurides
    - . . lead tellurides
    - . . mercury tellurides
    - . . . mercury cadmium tellurides
    - . . tin tellurides
    - . . zinc tellurides
  - RT intermetallics
- tellurium**
- GS chemical elements
    - . metalloids
    - . . **tellurium**
    - . . . tellurium isotopes
    - . nuclides
    - . . isotopes
    - . . . **tellurium**
    - . . . . tellurium isotopes
- tellurium 119*  
USE **tellurium isotopes**
- tellurium alloys**
- GS alloys
    - . **tellurium alloys**
- tellurium compounds**
- GS **tellurium compounds**
    - . tellurides
    - . . bismuth tellurides
    - . . cadmium tellurides
    - . . indium tellurides
    - . . lanthanum tellurides
    - . . lead tellurides
    - . . mercury tellurides
    - . . . mercury cadmium tellurides
    - . . tin tellurides
    - . . zinc tellurides
  - RT ∞ chemical compounds
  - ∞ Group 6A compounds
- tellurium isotopes**
- UF *tellurium 119*
  - GS chemical elements
    - . metalloids
    - . . tellurium
    - . . . **tellurium isotopes**
    - . nuclides
    - . . isotopes
    - . . . tellurium
    - . . . . **tellurium isotopes**
- tellurometers**
- GS measuring instruments
    - . distance measuring equipment
    - . . **tellurometers**
  - RT geodimeters
  - range finders
- telomeres**  
(added October 2004)  
DEF Terminal section of a chromosome involved in chromosomal replication and stability.
- RT chromosome aberrations

## Telstar 1 satellite

chromosomes  
genes

### Telstar 1 satellite

GS artificial satellites  
. Telstar satellites  
. . **Telstar 1 satellite**

### Telstar 2 satellite

GS artificial satellites  
. Telstar satellites  
. . **Telstar 2 satellite**

### Telstar project

GS programs  
. projects  
. . **Telstar project**  
RT artificial satellites  
communication satellites  
Comsat program

### Telstar satellites

GS artificial satellites  
. **Telstar satellites**  
. . Telstar 1 satellite  
. . Telstar 2 satellite  
RT Comsat program  
Thor Delta launch vehicle

### TEM (microscopy)

USE **transmission electron microscopy**

### Tempel 1 comet

(added July 2005)

GS celestial bodies  
. comets  
. . **Tempel 1 comet**  
RT Deep Impact Mission  
hypervelocity impact  
hypervelocity projectiles  
impact damage  
projectile cratering  
Tempel 2 comet

### Tempel 2 comet

DEF A comet for which a spacecraft rendezvous had been planned for 1988 because of its accessible orbit. It has been replaced by a planned spacecraft rendezvous with the Wild 2 comet in 1994.

GS celestial bodies  
. comets  
. . **Tempel 2 comet**  
RT  $\infty$  coma  
meteoroids  
solar system  
Tempel 1 comet

### temper (metallurgy)

RT cold working  
ductility  
hardness  
heat treatment  
tempering

### temperate regions

UF *midlatitudes*  
*subtropical regions*  
GS regions  
. **temperate regions**  
RT climatology  
geography  
polar regions  
tropical regions

### temperature

DEF In general, the intensity of heat as measured on some definite temperature scale by means of any of various types of thermometers. In statistical mechanics, a measure of translational molecular kinetic energy (with three degrees of freedom). In thermodynamics, the integrating factor of the differential equation referred to as the first law of thermodynamics. Used for body temperature (non-biological).

UF *body temperature (non-biological)*  
GS **temperature**  
. absolute zero  
. ambient temperature  
. atmospheric temperature

. . auroral temperature  
. . ionospheric temperature  
. body temperature  
. brightness temperature  
. combustion temperature  
. critical temperature  
. Curie temperature  
. flame temperature  
. gas temperature  
. glass transition temperature  
. high temperature  
. ignition temperature  
. . flash point  
. inlet temperature  
. ion temperature  
. low temperature  
. . cryogenic temperature  
. lunar temperature  
. neel temperature  
. noise temperature  
. operating temperature  
. planetary temperature  
. plasma temperature  
. room temperature  
. satellite temperature  
. skin temperature (biology)  
. solar temperature  
. space temperature  
. spin temperature  
. stagnation temperature  
. stellar temperature  
. subzero temperature  
. surface temperature  
. . land surface temperature  
. . sea surface temperature  
. . skin temperature (non-biological)  
. . wall temperature  
. transition temperature  
. water temperature  
. . ocean temperature  
. . . sea surface temperature  
RT ablative materials  
adiabatic conditions  
air conditioning  
biological effects  
climatology  
comfort  
convective flow  
electron energy  
emissivity  
environments  
free convection  
geotemperature  
Gibbs-Helmholtz equations  
heat  
heat shielding  
heat storage  
heating  
humidity  
isotherms  
lapse rate  
melting points  
meteorology  
ocean thermal energy conversion  
refrigerating  
Saha equations  
surface cooling  
temperature compensation  
temperature control  
temperature dependence  
temperature distribution  
temperature effects  
temperature gradients  
temperature inversions  
temperature measurement  
temperature measuring instruments  
temperature probes  
temperature profiles  
temperature ratio  
temperature scales  
temperature sensors  
tephigrams  
thermal absorption  
thermal analysis  
thermal blooming  
thermal boundary layer  
thermal buckling  
thermal comfort  
thermal conductivity

thermal conductivity gages  
thermal conductors  
thermal control coatings  
thermal cycling tests  
thermal decomposition  
thermal degradation  
thermal diffusion  
thermal diffusivity  
thermal dissociation  
thermal emission  
thermal energy  
thermal environments  
thermal expansion  
thermal fatigue  
thermal instability  
thermal insulation  
thermal mapping  
thermal neutrons  
thermal noise  
thermal plasmas  
thermal pollution  
thermal protection  
thermal radiation  
thermal reactors  
thermal resistance  
thermal resources  
thermal shock  
thermal simulation  
thermal stability  
thermal stresses  
thermal vacuum tests  
thermodynamic efficiency  
thermodynamic properties  
ventilation

### temperature compensation

GS instrument compensation  
. **temperature compensation**  
RT  $\infty$  compensation  
temperature

### temperature control

UF *heat regulation*  
RT air conditioning  
automatic control  
automatic control valves  
capillary pumped loops  
chemical reaction control  
combustion control  
 $\infty$  control  
controllers  
cooling  
cooling systems  
cryostats  
engine control  
environmental control  
environmental engineering  
exhaust systems  
heat shielding  
heating  
heating equipment  
high temperature tests  
infrared suppression  
low temperature tests  
manual control  
plasma cooling  
refrigerating  
refrigerating machinery  
remote control  
reusable heat shielding  
space cooling (buildings)  
space heating (buildings)  
spacecraft temperature  
temperature  
thermal control coatings  
thermal cycling tests  
thermal insulation  
thermochromic coatings  
thermometers  
thermoregulation  
thermostats  
transpiration  
ventilation  
water heating

### temperature dependence

DEF The characteristic of a material which is dependent on changes in the ambient temperature.  
GS dependence

- . **temperature dependence**
- RT heat affected zone  
hot corrosion  
miscibility gap  
temperature  
temperature effects  
thermal degradation  
thermal stability
- temperature differences*
- USE **temperature gradients**
- temperature distribution**
- UF *temperature fields*
- GS distribution (property)
- . **temperature distribution**
- RT air conditioning  
cooling  
cooling systems  
environmental engineering  
field theory (physics)  
heat treatment  
heating  
isothermal flow  
isothermal layers  
isotherms  
ocean temperature  
refrigerating  
satellite temperature  
temperature  
thermal mapping  
thermal resources  
thermal shock  
thermal stresses  
thermography  
ventilation  
vertical distribution  
water temperature
- temperature effects**
- UF *heat effects*  
*photothermotropism*  
*Richardson-Dushman equation*  
*thermal effects*  
*thermotropism*
- RT ablation  
absolute zero  
chemical effects
- ∞ effects  
Ettingshausen effect  
glass transition temperature  
heat affected zone  
jet blast effects  
magnetic effects  
Nernst-Ettingshausen effect  
Peltier effects  
pressure effects
- ∞ radiation  
reentry effects  
Seebeck effect  
shape memory alloys  
solar granulation  
sterilization effects  
temperature  
temperature dependence  
thermal buckling  
thermal degradation  
thermal dissociation  
thermal resistance  
thermal stresses  
thermogravimetry  
thermoluminescence  
thermophoresis  
thermoplasticity  
time temperature parameter
- temperature fields*
- USE **temperature distribution**
- temperature gradients**
- UF *temperature differences*
- GS gradients
- . **temperature gradients**
- . . . thermoclines
- RT atmospheric temperature  
bathythermographs  
Chapman-Enskog theory  
convective heat transfer  
isothermal layers  
isotherms
- nonisothermal processes  
ocean temperature  
potential gradients  
stratification  
temperature  
temperature  
thermal analysis  
thermal mapping  
thermocapillary migration  
thermomigration  
thermophoresis
- temperature indicators*
- USE **indicating instruments**  
**temperature measuring instruments**
- temperature instruments*
- USE **temperature measuring instruments**
- temperature inversions**
- GS inversions
- . **temperature inversions**
- RT air pollution  
atmospheric temperature  
bending  
birefringence  
buckling  
cracking (fracturing)  
cracks  
creep properties  
deflection  
deformation  
displacement  
distortion  
failure  
fatigue (materials)  
internal pressure  
lapse rate  
mechanical properties  
meteorological parameters  
meteorology  
photoelastic analysis  
plastic deformation  
pressure  
pressure effects  
residual stress  
Saint Venant principle  
shear properties  
shrinkage  
strain gages  
strain hardening  
strain rate  
stress analysis  
stress relaxation  
stress waves  
stresses  
structural strain  
temperature  
tensile deformation
- ∞ tension  
tephigrams  
torsion  
volumetric strain  
x ray stress analysis  
yield strength
- temperature measurement**
- UF *pyrometry*  
*thermometry*
- RT anomalous temperature zones  
bolometers  
brightness temperature  
crayons  
gas temperature  
high temperature  
in situ measurement  
∞ measurement  
noise temperature  
nonintrusive measurement  
pyrometers  
radiation pyrometers  
resistance thermometers  
satellite temperature  
sound detecting and ranging  
temperature  
temperature sensitive paints  
thermocouple pyrometers  
thermocouples  
thermography
- thermometers  
wind tunnel calibration
- temperature measuring instruments**
- UF *temperature indicators*  
*temperature instruments*  
*thermograms*
- GS measuring instruments
- . **temperature measuring instruments**
- . . . bathythermographs  
. . . optical pyrometers  
. . . pneumatic probes  
. . . pyrometers  
. . . . radiation pyrometers  
. . . . thermocouple pyrometers  
. . . temperature probes  
. . . thermometers  
. . . . resistance thermometers
- RT anomalous temperature zones  
bolometers  
bomb calorimeters  
calorimeters  
drop calorimeters  
flame calorimeters  
flame probes  
temperature  
thermistors  
thermocouples  
thermopiles  
thermostats  
transducers
- temperature probes**
- GS measuring instruments  
. temperature measuring instruments
- . . **temperature probes**
- RT temperature  
thermocouples
- temperature profiles**
- RT heat transfer  
temperature  
thermal analysis
- temperature ratio**
- GS ratios
- . **temperature ratio**
- RT data correlation  
heat transfer  
temperature
- temperature scales**
- UF *fahrenheit temperature scale*  
*international practical temperature*
- RT absolute zero  
anomalous temperature zones  
calibrating
- ∞ scale  
standards  
temperature  
thermometers
- temperature sensitive paints**  
(added January 2003)
- DEF Luminescent paints which react differentially to temperature by emitting varying amounts of visible light.
- GS coatings  
. paints  
. . **temperature sensitive paints**
- RT aerodynamic heating  
fluorescence  
heat transfer  
luminescence  
nonintrusive measurement  
surface temperature  
temperature measurement  
thermal analysis  
thermochromic coatings
- temperature sensors**
- GS **temperature sensors**
- . thermistors
- RT anomalous temperature zones  
temperature
- tempering**
- GS heat treatment  
. **tempering**



## templates

RT annealing  
∞ drawing  
hardening (materials)  
laser annealing  
metal working  
normalizing (heat treatment)  
stress relieving  
stretching  
temper (metallurgy)

**templates**  
RT lofting  
molds  
∞ patterns

**temporal distribution**  
DEF The statistical distribution based on time of phenomena, occurrences or events.  
RT annual variations  
spatial distribution  
teleconnections (meteorology)  
time dependence  
∞ time response

**temporal logic**  
(added October 1994)  
DEF A logic that can express properties involving the sequencing of events in time.  
RT discriminant analysis (statistics)  
∞ logic  
logic programming  
mathematical logic  
sequential analysis  
temporal resolution

**temporal resolution**  
DEF The precision with which an optical instrument or a system differentiates between time intervals. Used for multitemporal analysis.  
UF *multitemporal analysis*  
GS resolution  
. **temporal resolution**  
RT spatial resolution  
temporal logic

**tendencies**  
RT ∞ inclination

**tendons**  
GS anatomy  
. musculoskeletal system  
. . muscles  
. . . **tendons**  
RT connective tissue  
fibroblasts

**tenite**  
RT cellulose  
molding materials

**Tenma satellite**  
(added June 1992)  
GS artificial satellites  
. scientific satellites  
. . astronomical satellites  
. . . **Tenma satellite**  
Japanese spacecraft  
. **Tenma satellite**  
observatories  
. astronomical observatories  
. . astronomical satellites  
. . . **Tenma satellite**  
RT Japanese space program  
x ray astronomy  
x ray spectra  
x ray stars

**Tennessee**  
GS nations  
. United States  
. . **Tennessee**  
RT Great Smoky Mountains (NC-TN)  
Tennessee Valley (AL-KY-TN)

**Tennessee Valley (AL-KY-TN)**  
GS valleys  
. **Tennessee Valley (AL-KY-TN)**  
RT Alabama  
Kentucky

Tennessee

*tensegric structures*  
(added January 2001)  
USE **tensegrity structures**

**tensegrity structures**  
(added January 2001)  
DEF A class of prestressed structures whose shape is guaranteed by the interaction between a continuous network of members in tension and a discontinuous network of members in compression. These members can serve simultaneously as sensors, actuators, and load carrying elements. The word tensegrity is a contraction of "tensional integrity".  
UF *tensegric structures*  
*tensile-integrity structures*  
RT isotensoid structures  
prestressing  
smart structures  
structural design  
∞ structures

**tensile creep**  
GS mechanical properties  
. creep properties  
. . **tensile creep**  
RT plastic deformation  
shear creep

**tensile deformation**  
GS deformation  
. **tensile deformation**  
RT elastic deformation  
elongation  
plastic deformation  
temperature inversions

**tensile properties**  
GS mechanical properties  
. **tensile properties**  
. . tensile strength  
RT elastic properties  
high strength alloys  
∞ properties

**tensile strength**  
DEF The property of solid material that indicates its ability to withstand a uniaxial tensile load.  
GS mechanical properties  
. tensile properties  
. . **tensile strength**  
RT ductility  
elastic properties  
elongation  
fiber strength  
high strength  
hysteresis  
load carrying capacity  
Poisson ratio  
residual strength  
resilience  
shear strength  
∞ strength  
toughness

**tensile stress**  
DEF Normal stress tending to lengthen the body in the direction in which it acts.  
GS stresses  
. **tensile stress**  
RT axial stress  
high strength  
hoops  
interfacial tension  
stress intensity factors  
∞ tension  
triaxial stresses

**tensile tests**  
RT destructive tests  
fatigue tests  
load tests  
specimen geometry  
static tests

∞ tests

*tensile-integrity structures*  
(added January 2001)  
USE **tensegrity structures**

**tensiometers**  
GS measuring instruments  
. **tensiometers**  
RT cable force recorders  
mechanical measurement

∞ **tension**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT blood pressure  
interfacial tension  
partial pressure  
stretching  
temperature inversions  
tensile stress

**tensometers**  
GS measuring instruments  
. **tensometers**  
RT deformeters  
extensometers  
strain gages  
stress measurement  
weight indicators

**tensor analysis**  
GS geometry  
. differential geometry  
. . **tensor analysis**  
RT relativity  
scalars  
scalars  
tensors

*tensor fields*  
USE **tensors**

**tensors**  
DEF Arrays of functions which obey certain laws of transformation. A one row or one column tensor array is a vector. Used for tensor fields and transformation tensors.  
UF *tensor fields*  
*transformation tensors*  
GS algebra  
. **tensors**  
. . stress tensors  
RT field theory (physics)  
Jordan form  
scalars  
tensor analysis

**tephigrams**  
GS diagrams  
. **tephigrams**  
RT atmospheric turbulence  
entropy  
lapse rate  
temperature  
temperature inversions  
thermodynamic properties

**terbium**  
GS chemical elements  
. rare earth elements  
. . **terbium**  
. . . terbium isotopes  
metals  
. rare earth elements  
. . **terbium**  
. . . terbium isotopes  
RT terbium compounds

*terbium 155*  
USE **terbium isotopes**

*terbium 161*  
USE **terbium isotopes**

**terbium compounds**  
GS rare earth compounds  
. **terbium compounds**

- RT terbium
- terbium isotopes**  
 UF *terbium 155*  
*terbium 161*  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **terbium isotopes**  
 . rare earth elements  
 . . terbium  
 . . . **terbium isotopes**  
 metals  
 . rare earth elements  
 . . terbium  
 . . . **terbium isotopes**
- TERCOM**  
 UF *Terrain Contour Matching Navigation System*  
 GS navigation aids  
 . **TERCOM**  
 onboard equipment  
 . airborne equipment  
 . . **TERCOM**  
 . aircraft equipment  
 . . **TERCOM**  
 RT display devices  
 flight instruments  
 map matching guidance  
 navigation instruments  
 ∞ systems  
 video landmark acquisition and tracking
- terephthalate**  
 GS **terephthalate**  
 . polyethylene terephthalate  
 RT carboxylic acids  
 dicarboxylic acids
- terminal area energy management**  
 DEF Automated guidance and landing system for the Space Shuttle orbiter.  
 GS management  
 . **terminal area energy management**  
 RT digital techniques  
 Space Shuttle orbiters  
 space transportation  
 spacecraft landing
- terminal ballistics**  
 DEF That branch of ballistics dealing with the motion and behavior of projectiles at the termination of their flight, or in striking and penetrating a target. Used for penetration ballistics, projectile penetration, and target penetration.  
 UF *penetration ballistics*  
*projectile penetration*  
*target penetration*  
 GS ballistics  
 . **terminal ballistics**  
 RT energy transfer  
 fragmentation  
 impact velocity  
 missiles  
 penetration  
 precision guided projectiles  
 projectiles
- Terminal Configured Vehicle Program**  
 DEF NASA Program for determining configurations for short haul transport aircraft, including V/STOL and VTOL aircraft. Used for TCX program.  
 UF *TCV program*  
 GS programs  
 . NASA programs  
 . . **Terminal Configured Vehicle Program**  
 RT aircraft design  
 automatic control  
 automatic flight control  
 automatic landing control  
 electronic control  
 feedback control
- ∞ vehicles
- terminal facilities**  
 GS **terminal facilities**  
 . ship terminals  
 RT artificial harbors  
 deepwater terminals  
 ∞ facilities  
 harbors  
 offshore docking  
 offshore platforms  
 site selection  
 tanker terminals  
 ∞ terminals  
 transportation  
 wharves
- terminal guidance**  
 GS guidance (motion)  
 . **terminal guidance**  
 . . laser guidance  
 RT autonomous docking  
 command guidance  
 descent trajectories  
 entry guidance (STS)  
 glide paths  
 homing  
 inertial guidance  
 midcourse guidance  
 proportional navigation  
 reentry  
 reentry guidance  
 reentry trajectories  
 reentry vehicles  
 rendezvous guidance  
 spacecraft guidance
- terminal velocity**  
 DEF The maximum velocity attainable, especially by a free falling body, under given conditions.  
 GS rates (per time)  
 . **terminal velocity**  
 velocity  
 . **terminal velocity**  
 RT gravitation  
 impact velocity
- ∞ terminals  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT connectors  
 data processing terminals  
 electric terminals  
 ∞ headers  
 jumpers  
 outlets  
 ship terminals  
 terminal facilities
- terminating*  
 USE **stopping**
- terminator lines**  
 RT ∞ lines  
 lunar phases  
 ∞ phases  
 sunrise  
 sunset
- terminology**  
 RT abbreviations  
 dictionaries  
 indexing (information science)  
 nomenclatures  
 thesauri  
 words (language)
- terms**  
 RT indexing (information science)  
 information theory  
 thesauri  
 words (language)
- ternary alloys**  
 GS alloys  
 . **ternary alloys**  
 . . Astroloy (trademark)  
 RT alloying  
 antiphase boundaries
- cluster variation method
- ternary systems**  
 RT alloys  
 binary systems (materials)  
 solid solutions  
 ∞ systems
- ternary systems (digital)*  
 USE **digital systems**
- terpenes**  
 DEF A class of unsaturated organic compounds having the empirical formula C<sub>10</sub>H<sub>16</sub> occurring in most essential oils and oleoresinous plants. Structurally the important terpenes and their derivatives are classified as monocyclic (dipentene), bicyclic (pinene), and acyclic (myrcene).  
 GS **terpenes**  
 . abscisic acid  
 . azulene  
 . camphor  
 . mecamlamine  
 . menthol  
 . turpentine  
 RT aliphatic hydrocarbons  
 alkenes  
 carotenoids
- terphenyls**  
 GS phenyls  
 . **terphenyls**
- Terra spacecraft**  
*(added June 1999)*  
 DEF First in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), the Multi-Angle Imaging Spectroradiometer (MISR), the Moderate Resolution Imaging Spectroradiometer (MODIS), and the Measurements of Pollution in the Troposphere (MOPITT) instrument.  
 UF *AM-1 (EOS) spacecraft*  
*EOS AM-1 spacecraft*  
 GS artificial satellites  
 . **Terra spacecraft**  
 Earth Observing System (EOS)  
 . **Terra spacecraft**  
 RT Aqua spacecraft  
 Aura spacecraft  
 CERES (experiment)  
 data products  
 Earth observations (from space)  
 MISR (radiometry)  
 MODIS (radiometry)  
 remote sensing
- terraces (landforms)**  
 GS landforms  
 . **terraces (landforms)**  
 . . plateaus  
 . . . Allegheny Plateau (US)  
 . . . Colorado Plateau (US)  
 . . . Great Basin (US)  
 . . . mesas  
 . . . . buttes  
 . . . . piedmonts  
 . . . . Central Piedmont (US)  
 RT formations  
 mountains
- terradynamics**  
 RT ∞ dynamics  
 Earth surface  
 geodynamics  
 projectiles  
 sea floor spreading
- terraforming**  
*(added September 1993)*  
 RT environmental engineering  
 exobiology  
 lunar bases

## terrain

lunar environment  
manned Mars missions  
Mars (planet)  
Mars environment  
Mars surface  
moon  
planetary atmospheres  
planetary environments  
space colonies  
space habitats  
Venus surface

### terrain

UF *landscape*  
GS *topography*  
. **terrain**  
RT digital elevation models  
geomorphology  
landforms  
landmarks

### terrain analysis

UF *SATAN (sensor)*  
RT ∞ analyzing  
change detection  
digital elevation models  
Earth analogs  
Earth resources  
EROS (satellites)  
geographic applications program  
hologrammetry  
mapping  
multisensor fusion  
nap-of-the-earth navigation  
photogrammetry  
reconnaissance  
satellite surfaces  
soil mapping  
soil sampling  
video landmark acquisition and tracking

*Terrain Contour Matching Navigation System*  
USE **TERCOM**

### terrain following

(added February 1995)  
DEF The flight path of an aircraft, helicopter, or missile at a constant altitude above the terrain or highest obstacle. The altitude constantly changes to conform to the varying height of the terrain and/or obstacles.  
GS maneuvers  
. **terrain following**  
navigation  
. air navigation  
. . . nap-of-the-earth navigation  
. . . **terrain following**  
RT attack aircraft  
cruise missiles  
evasive actions  
flight envelopes  
hovering  
low altitude  
map matching guidance  
military helicopters  
obstacle avoidance  
penetration

### terrestrial dust belt

GS particles  
. dust  
. . . **terrestrial dust belt**  
RT ∞ belts  
cosmic dust  
gegenschlein  
meteoroid dust clouds  
micrometeoroids  
zodiacal dust

### terrestrial magnetism

USE **geomagnetism**

### terrestrial planets

DEF The four small planets nearest the sun (Earth, Mercury, Venus, and Mars).  
GS celestial bodies  
. planets  
. . . **terrestrial planets**  
. . . Earth (planet)

. . . Mars (planet)  
. . . Mercury (planet)  
. . . Venus (planet)  
RT celestial mechanics  
Mercury surface  
planetary environments  
planetology  
solar system

### terrestrial radiation

SN (EXCLUDES ATMOSPHERIC RADIATION AND REFLECTED VISIBLE LIGHT)  
UF *Earth radiation*  
GS electromagnetic radiation  
. **terrestrial radiation**  
RT atmospheric radiation  
CERES (experiment)  
Earth (planet)  
Earth albedo  
Earth radiation budget  
Earth radiation budget experiment  
extraterrestrial radiation  
far infrared radiation  
greenhouse effect  
infrared radiation  
MISR (radiometry)  
near infrared radiation  
planetary radiation  
∞ radiation  
tropospheric radiation

### terrier missile

GS missiles  
. antiaircraft missiles  
. . **terrier missile**  
. surface to air missiles  
. . **terrier missile**  
RT Bumblebee project  
multistage rocket vehicles  
solid propellant rocket engines

### terrorism

(added December 2001)  
DEF The use of violence, or threat of violence directed at civilian populations with the intention of intimidating or coercing a particular group, organization, or government, often for ideological or political reasons.  
GS crime  
. **terrorism**  
RT air piracy  
aircraft safety  
airport security  
biological weapons  
computer information security  
explosives detection  
flight safety  
sabotage  
security  
violence

### Tertiary Period

(added June 1989)  
GS Cenozoic Era  
. **Tertiary Period**  
RT Cretaceous Period  
Cretaceous-Tertiary boundary  
geochronology  
paleontology  
Quaternary period

### tesseral harmonics

GS analysis (mathematics)  
. functional analysis  
. . harmonic analysis  
. . . **tesseral harmonics**  
harmonics  
. **tesseral harmonics**  
RT satellite perturbation

### test beds

USE **test stands**

### test chambers

DEF Places, sections, or rooms having special characteristics where a person or object is subjected to experiment, as an altitude chamber. Used for environmental chambers.  
UF *environmental chambers*  
GS compartments

### . test chambers

. . anechoic chambers  
. . pressure chambers  
. . . hyperbaric chambers  
. . . vacuum chambers  
. . reverberation chambers  
RT ∞ capsules  
∞ chambers  
cryogenic wind tunnels  
environment models  
environment simulators  
environmental control  
environmental laboratories  
environmental tests  
thermal vacuum tests  
vacuum tests  
wind tunnels

### ∞ test equipment

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *checkout equipment*  
*testers*  
*testing machines*  
RT analyzers  
astrionics  
automatic test equipment  
avionics  
∞ capsules  
CEFOAM checkout equipment  
centrifuges  
checkout  
dynamometers  
Earth terminal measurement system  
electronic equipment tests  
∞ equipment  
fatigue testing machines  
free flight test apparatus  
frequency analyzers  
geophysical fluid flow cells  
ground support equipment  
Hartmann-Sprenger tubes  
hypersonic test apparatus  
impact testing machines  
load testing machines  
measuring instruments  
monoscopes  
onboard equipment  
rocket propelled sleds  
samplers  
simulators  
supersonic test apparatus  
test facilities  
test pattern generators  
test stands  
wind tunnel models  
wind tunnels

### test facilities

GS **test facilities**  
. anechoic chambers  
. Central Atlantic Regional Ecol Test Site  
. engine testing laboratories  
. environmental laboratories  
. hydraulic test tunnels  
. reverberation chambers  
. rocket test facilities  
. test ranges  
. . ballistic ranges  
. . missile ranges  
. test stands  
. Transient Reactor Test Facility  
. wind tunnels  
. . blowdown wind tunnels  
. . combustion wind tunnels  
. . cryogenic wind tunnels  
. . hypersonic wind tunnels  
. . . cascade wind tunnels  
. . . hotshot wind tunnels  
. . . plasma jet wind tunnels  
. . . shock tunnels  
. . hypervelocity wind tunnels  
. . . cascade wind tunnels  
. . . hotshot wind tunnels  
. . . plasma jet wind tunnels  
. . . shock tunnels  
. . low density wind tunnels  
. . low speed wind tunnels

. . . subsonic wind tunnels  
 . . rectangular wind tunnels  
 . . slotted wind tunnels  
 . . supersonic wind tunnels  
 . . transonic wind tunnels  
 . . trisonic wind tunnels  
 RT ∞ facilities  
 flight simulators  
 laboratories  
 models  
 motion simulators  
 research facilities  
 shock tubes  
 simulators  
 solar simulators  
 spacecraft cabin simulators  
 ∞ test equipment  
 ∞ tests

**test firing**  
 DEF The firing of a rocket engine, either live or static, with the purpose of making controlled observations of the engine or of an engine component.  
 GS firing (igniting)  
 . **test firing**  
 . . static firing  
 RT engine tests  
 fuel tests  
 ground tests  
 missile tests  
 prefiring tests  
 prelaunch tests  
 rocket firing  
 rocket test facilities  
 static tests  
 ∞ tests

**test pattern generators**  
 DEF Image-processing software.  
 RT ∞ faults  
 ∞ generators  
 ∞ patterns  
 ∞ test equipment

**test pilots**  
 GS personnel  
 . flying personnel  
 . . pilots (personnel)  
 . . . aircraft pilots  
 . . . . **test pilots**  
 . operators (personnel)  
 . . pilots (personnel)  
 . . . aircraft pilots  
 . . . . **test pilots**  
 RT ∞ pilots

**test ranges**  
 GS ranges (facilities)  
 . **test ranges**  
 . . ballistic ranges  
 . . missile ranges  
 test facilities  
 . **test ranges**  
 . . ballistic ranges  
 . . missile ranges  
 RT downrange  
 downrange measurement  
 range safety  
 rocket test facilities

**test stands**  
 DEF Stationary platforms or tables, together with any testing apparatus attached thereto, for testing or proving engines or instruments.  
 UF *test beds*  
 GS test facilities  
 . **test stands**  
 RT engine tests  
 flame deflectors  
 prefiring tests  
 prelaunch tests  
 rocket test facilities  
 ∞ test equipment

**test vehicles**  
 GS **test vehicles**  
 . flight test vehicles  
 RT ∞ aircraft  
 altitude tests

∞ ballistic vehicles  
 ∞ capsules  
 electric motor vehicles  
 high altitude tests  
 hypersonic vehicles  
 launch vehicles  
 missile tests  
 missiles  
 reentry vehicles  
 research aircraft  
 rocket vehicles  
 ∞ spacecraft  
 ∞ tests  
 towed bodies  
 ∞ vehicles

*testers*  
 USE **test equipment**

**testes**  
 GS anatomy  
 . genitourinary system  
 . . reproductive systems  
 . . . sex glands  
 . . . . gonads  
 . . . . . **testes**  
 . glands (anatomy)  
 . . endocrine glands  
 . . . gonads  
 . . . . **testes**  
 . . sex glands  
 . . . gonads  
 . . . . **testes**

*testing*  
 USE **tests**

*testing machines*  
 USE **test equipment**

**testing time**  
 GS time  
 . **testing time**  
 RT burning time  
 engine tests  
 fatigue tests  
 flight time  
 ∞ tests  
 turnaround (STS)  
 windows (intervals)

∞ **tests**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 UF *pretests*  
*testing*  
 RT accelerated life tests  
 acceptability  
 accuracy  
 adhesion tests  
 altitude tests  
 approach and landing tests (STS)  
 bend tests  
 captive tests  
 checkout  
 chemical analysis  
 chemical tests  
 cold flow tests  
 cold weather tests  
 compression tests  
 computational chemistry  
 confidence limits  
 corrosion test loops  
 corrosion tests  
 creep tests  
 crew procedures (inflight)  
 crew procedures (preflight)  
 damping tests  
 destructive tests  
 drop tests  
 dynamic tests  
 education  
 electric equipment tests  
 electronic equipment tests  
 employment  
 engine tests  
 environmental tests  
 errors  
 evaluation  
 examination

extrapolation  
 fatigue tests  
 field tests  
 flight stability tests  
 flight tests  
 fuel tests  
 full scale tests  
 ground tests  
 hardness tests  
 high altitude tests  
 high temperature tests  
 impact tests  
 in vitro methods and tests  
 in vivo methods and tests  
 intelligence tests  
 laboratories  
 load tests  
 low temperature tests  
 lubricant tests  
 ∞ materials tests  
 median (statistics)  
 missile tests  
 nondestructive tests  
 notch tests  
 orbital space tests  
 patch tests  
 performance tests  
 personality tests  
 physiological tests  
 prefiring tests  
 preflight analysis  
 prelaunch tests  
 program verification (computers)  
 propellant tests  
 proving  
 psychological tests  
 qualifications  
 quality  
 quality control  
 railroad humping tests  
 rank tests  
 reactor startup tests  
 records  
 reliability  
 resonance testing  
 Rorschach tests  
 salt spray tests  
 sampling  
 selection  
 self tests  
 shock tests  
 Snellen tests  
 space electric rocket tests  
 Space Transportation System flights  
 space vehicle checkout program  
 spin tests  
 stability tests  
 static tests  
 statistical tests  
 stroking tests  
 tasks  
 tensile tests  
 test facilities  
 test firing  
 test vehicles  
 testing time  
 thermal cycling tests  
 thermal vacuum tests  
 ultrasonic tests  
 vacuum tests  
 vibration tests  
 water tunnel tests  
 wear tests  
 weld tests  
 wind tunnel stability tests  
 wind tunnel tests  
 wing flow method tests  
 x ray inspection

**tethered balloons**  
 UF *kite balloons*  
 GS expandable structures  
 . inflatable structures  
 . . balloons  
 . . . **tethered balloons**  
 RT meteorological balloons  
 reels

**tethered satellites**  
 DEF Concept for scientific payloads sus-

## tethering

pended at altitudes of 120 km from Space Shuttle orbiters flying at 200-km altitude; control system would permit deployment and retrieval of the tethered satellites.

GS artificial satellites  
. tethered satellites

RT reels

### tethering

RT orbital rendezvous  
reels  
tetherlines

### tetherlines

RT anchors (fasteners)  
∞ cables  
∞ lines  
tethering  
towed bodies  
umbilical connectors

### Tethys

DEF One of the natural satellites of Saturn orbiting at a mean distance of 295,000 kilometers.

GS celestial bodies  
. natural satellites  
. . . icy satellites  
. . . **Tethys**  
. . . Saturn satellites  
. . . **Tethys**

RT Saturn (planet)

### tetrabutyls

GS alkyl compounds  
. **tetrabutyls**  
RT dibutyl compounds  
organometallic compounds

### tetrachlorides

GS halogen compounds  
. chlorine compounds  
. . . chlorides  
. . . **tetrachlorides**  
. halides  
. . . chlorides  
. . . **tetrachlorides**

### tetrachloromethane

USE **carbon tetrachloride**

### tetracyclines

GS drugs  
. antibiotics  
. . . **tetracyclines**  
organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . **tetracyclines**

### tetrad theory

RT chromosomes  
meiosis  
spores  
∞ theories

### tetraethyl orthocarbonates

GS carbon compounds  
. carbonates  
. . . **tetraethyl orthocarbonates**

### tetraethyl orthosilicate

DEF An oxidation inhibiting coating used on the wing leading edges and nose cap of the Space Shuttle.

GS adhesives  
. **tetraethyl orthosilicate**

RT ethyl compounds  
glues  
silicates

### tetrafluorohydrazine

GS halogen compounds  
. fluorine compounds  
. . . fluoro compounds  
. . . **tetrafluorohydrazine**  
hydrazines  
. **tetrafluorohydrazine**  
organic compounds  
. amines  
. . . **tetrafluorohydrazine**

RT rocket oxidizers

### tetragons

GS geometry  
. Euclidean geometry  
. . . polygons  
. . . . **tetragons**  
. . . . parallelograms  
. . . . rhomboids  
. . . . rectangles  
. . . . squares (mathematics)  
. . . . trapezoids

### tetrahedrons

GS geometry  
. Euclidean geometry  
. . . polyhedrons  
. . . . **tetrahedrons**  
RT triangles

### tetrahydrofuran

DEF In organic chemistry, an intermediate and a solvent for polyvinyl chloride. Used for butylene oxides.

UF *butylene oxides*

GS organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . furans  
. . . . **tetrahydrofuran**  
solvents  
. **tetrahydrofuran**

RT additives  
∞ chemical compounds  
plastics  
polyvinyl chloride

### tetranitrotetrazacyclooctane

USE **HMX**

### tetraphenyls

GS phenyls  
. polyphenyls  
. . . **tetraphenyls**

### tetrazoles

GS organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . **tetrazoles**

### tetrodes

RT electron tubes  
pentodes  
semiconductor devices  
transistors  
triodes

### tetroons

USE **superpressure balloons**

### tetryl

GS explosives  
. **tetryl**  
nitrogen compounds  
. nitro compounds  
. . . **tetryl**  
organic compounds  
. amines  
. . . **tetryl**  
propellants  
. **tetryl**

### texas

GS nations  
. United States  
. . . **texas**  
RT Gulf of Mexico  
Houston (TX)  
Lake Texoma (OK-TX)  
Rio Grande (North America)

### textbooks

GS documents  
. **textbooks**  
educational resources  
. **textbooks**  
RT education  
handbooks  
knowledge  
learning

libraries  
manuals  
subjects

### textiles

GS **textiles**  
. cotton fibers  
. linen  
. rayon  
RT clothing  
cotton  
fabrics  
fibers  
vapor barrier clothing  
wet spinning

### texts

GS documents  
. **texts**  
RT format  
records

### textures

DEF The structural qualities of surfaces determined by the interrelation of their elements.  
RT curl (materials)  
fineness  
Gabor filters  
mechanical properties  
porosity  
surface properties

### TF-30 engine

GS engines  
. air breathing engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-30 engine**  
. aircraft engines  
. . . **TF-30 engine**  
. internal combustion engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-30 engine**  
. turbine engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-30 engine**

### TF-34 engine

GS engines  
. air breathing engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-34 engine**  
. aircraft engines  
. . . **TF-34 engine**  
. internal combustion engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-34 engine**  
. turbine engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-34 engine**  
RT convertible fan-shaft engines

### TF-41 engine

GS engines  
. air breathing engines  
. . . gas turbine engines  
. . . . jet engines  
. . . . turbojet engines  
. . . . . turbofan engines  
. . . . . **TF-41 engine**  
. aircraft engines  
. . . **TF-41 engine**  
. internal combustion engines

- . . . gas turbine engines
- . . . . jet engines
- . . . . turbojet engines
- . . . . . turbofan engines
- . . . . . **TF-41 engine**
- . turbine engines
- . . gas turbine engines
- . . . jet engines
- . . . . turbojet engines
- . . . . . turbofan engines
- . . . . . **TF-41 engine**

*TFX aircraft*

USE **F-111 aircraft**

**TH-55 helicopter**

- GS Hughes aircraft
- . **TH-55 helicopter**
- V/STOL aircraft
- . rotary wing aircraft
- . . helicopters
- . . . **TH-55 helicopter**

**Thailand**

- GS nations
- . **Thailand**
- RT Asia

**thalamus**

- GS anatomy
- . nervous system
- . . central nervous system
- . . . brain
- . . . . diencephalon
- . . . . . **thalamus**

**thallium**

- GS chemical elements
- . **thallium**
- . . thallium isotopes
- metals
- . **thallium**
- . . thallium isotopes
- RT thallium compounds

**thallium alloys**

- GS alloys
- . **thallium alloys**

**thallium compounds**

- RT ∞ metal compounds
- thallium

**thallium isotopes**

- GS chemical elements
- . nuclides
- . . isotopes
- . . . **thallium isotopes**
- . thallium
- . . **thallium isotopes**
- metals
- . thallium
- . . **thallium isotopes**

*thawing*

USE **melting**

*THC (oceanography)*

(added February 2002)

USE **thermohaline circulation**

**Thebe**

(added January 1996)

DEF A natural satellite of Jupiter orbiting at a mean distance of 221,900 kilometers.

- GS celestial bodies
- . natural satellites
- . . Jupiter satellites
- . . . **Thebe**
- RT Jupiter (planet)

**thematic mappers (LANDSAT)**

DEF Landsat multispectral scanners designed to acquire data to categorize the Earth's surface. Particular emphasis was placed on agricultural applications and land use.

- GS optical equipment
- . optical scanners
- . . multispectral band scanners
- . . . **thematic mappers (LANDSAT)**
- remote sensors

**thematic mappers (LANDSAT)**

- scanners
- . optical scanners
- . . multispectral band scanners
- . . . **thematic mappers (LANDSAT)**
- RT Landsat 4
- Landsat 5
- remote sensing
- thematic mapping

**thematic mapping**

- GS mapping
- . **thematic mapping**
- RT cadastral mapping
- data products
- maps
- photogeology
- photomapping
- photomaps
- thematic mappers (LANDSAT)

**Themis project**

- GS programs
- . projects
- . . **Themis project**

**theodolites**

DEF Optical instruments which consist of a sighting telescope, mounted so that it is free to rotate around horizontal and vertical axes, and graduated scales so that the angle of rotation may be measured. The telescope is usually fitted with a right angle prism so that the observer continues to look horizontally into the eyepiece, whatever the variation of the elevation angle.

- GS measuring instruments
- . optical measuring instruments
- . . transits
- . . . **theodolites**
- . . . . cinetheodolites
- optical equipment
- . optical measuring instruments
- . . transits
- . . . **theodolites**
- . . . . cinetheodolites
- RT sextants

**Theodorsen transformation**

- RT airfoil profiles
- complex variables
- conformal mapping
- coordinate transformations
- Joukowski transformation
- pressure distribution

**theorem proving**

- GS problem solving
- . **theorem proving**
- proving
- . **theorem proving**
- RT artificial intelligence
- computer programming
- predicate calculus
- theorems

**theorems**

- UF *lemmas*
- GS **theorems**
- . addition theorem
- . Bayes theorem
- . Bernoulli theorem
- . binomial theorem
- . Castiglione variational theorem
- . duality theorem
- . equipartition theorem
- . existence theorems
- . Floquet theorem
- . Gauss-Markov theorem
- . Hellmann-Feynman theorem
- . Kakutani theorem
- . Lebesgue theorem
- . Liouville theorem
- . Michell theorem
- . Pomeranchuk theorem
- . Poynting theorem
- . reciprocal theorems
- . reciprocity theorem
- . Richards theorem
- . Riesz theorem

- . Schauder fixpoint theorem
- . similarity theorem
- . . Lagrange similarity hypothesis
- . Stokes theorem (vector calculus)
- . uniqueness theorem
- . virial theorem
- RT hypotheses
- mathematical logic
- ∞ mathematics
- Taylor series
- theorem proving

**theoretical physics**

- GS **theoretical physics**
- . Newton Theory
- . quantum theory
- . . Bohr theory
- RT astrophysics
- broken symmetry
- charm (particle physics)
- electrophysics
- flavor (particle physics)
- geophysics
- grand unified theory
- naked singularities
- nuclear physics
- ∞ physics
- plasma physics
- radio physics
- ∞ science
- ∞ solid state physics
- strange attractors
- string theory
- supergravity
- supersymmetry
- unified field theory
- Yang-Mills theory

∞ **theories**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT Abrikosov theory
- assumptions
- atomic theory
- automata theory
- BCS theory
- Bellman theory
- bending theory
- Bessel-Bredichin theory
- bimetric theories
- Bogoliubov theory
- Bohr theory
- Born-Infeld theory
- catastrophe theory
- Chapman-Enskog theory
- communication theory
- control theory
- Crocco-Lee theory
- Debye-Huckel theory
- decision theory
- density functional theory
- diffusion theory
- dynamo theory
- Dyson theory
- Eyring theory
- field mode theory
- field theory (algebra)
- field theory (physics)
- finite difference theory
- flow theory
- fluctuation theory
- Foster theory
- game theory
- gauge theory
- geometrical theory of diffraction
- Gestalt theory
- Glauber theory
- goal theory
- graph theory
- gravitation theory
- Griffith crack
- group theory
- Hansen lunar theory
- Heisenberg theory
- Hill lunar theory
- homotopy theory
- Hueckel theory
- hypotheses
- information theory

## therapy

Jeans theory  
kinetic theory  
Kolmogorov theory  
learning theory  
Malkus theory  
Manning theory  
matrix theory  
Michaelis theory  
mixing length flow theory  
molecular theory  
momentum theory  
Newton Theory  
nonadiabatic theory  
number theory  
numerical differentiation  
Opik theory  
orthogonal multiplexing theory  
particle theory  
perturbation theory  
physical optics  
piston theory  
plate theory  
population theory  
potential theory  
probability theory  
quantum chromodynamics  
quantum theory  
queueing theory  
Reissner theory  
relativistic theory  
S matrix theory  
saddle points (game theory)  
set theory  
shell theory  
spectral theory  
statistical decision theory  
strong interactions (field theory)  
Sturm-Liouville theory  
switching theory  
tetrad theory  
transport theory  
vinti theory  
weak interactions (field theory)  
Yang-Mills theory  
Young-Helmholtz theory

## therapy

GS **therapy**  
. chemotherapy  
. gene therapy  
. massaging  
. psychotherapy  
. radiation therapy  
RT cures  
diseases  
healing  
medical equipment  
patients  
respirators  
skin grafts

## thermal absorption

GS energy absorption  
. **thermal absorption**  
. . polar cap absorption  
RT ablation  
 $\infty$  absorption  
atmospheric attenuation  
charring  
gray gas  
heat sinks  
pyrolysis  
temperature

*thermal accommodation coefficients*  
USE **accommodation coefficient**

*thermal agitation*  
USE **thermal energy**

## thermal analysis

DEF A general term covering a group of related techniques whereby the dependence of the parameters of any physical property of a substance or temperature is measured. Used for differential thermal analysis and DTA (analysis).  
UF *differential thermal analysis*  
*DTA (analysis)*  
RT  $\infty$  analyzing  
heat transmission

temperature  
temperature gradients  
temperature profiles  
temperature sensitive paints

## thermal barriers (plasma control)

RT  $\infty$  barriers  
fusion reactors  
mirror fusion  
plasma control  
tandem mirrors

## thermal batteries

GS electric generators  
. direct power generators  
. . primary batteries  
. . . **thermal batteries**  
electrochemical cells  
. electric batteries  
. . primary batteries  
. . . **thermal batteries**  
RT alkaline batteries  
dry cells

## thermal blooming

UF *laser beam defocusing*  
*thermal defocusing*  
GS thermal lensing  
. **thermal blooming**  
RT laser cutting  
laser heating  
laser outputs  
lasers  
photon beams  
temperature

## thermal boundary layer

GS boundary layers  
. **thermal boundary layer**  
RT hypersonic boundary layer  
laminar boundary layer  
Rayleigh-Benard convection  
temperature  
turbulent boundary layer

## thermal buckling

GS buckling  
. **thermal buckling**  
RT expansion  
temperature  
temperature effects  
thermal expansion

## thermal comfort

DEF That condition which expresses satisfaction with the thermal environment and which is measured by such factors as air temperature, relative humidity, air velocity, etc.  
RT heat stroke  
temperature  
thermal environments

## thermal conductivity

DEF Time rate of unidirectional heat transfer per unit area, in the steady-state, between parallel planes separated by unit distance, per unit difference of temperature of the planes.  
GS thermodynamic properties  
. thermophysical properties  
. . **thermal conductivity**  
transport properties  
. **thermal conductivity**  
RT air conductivity  
atmospheric conductivity  
conductive heat transfer  
 $\infty$  conductivity  
Fourier law  
hot-wire flowmeters  
Lewis numbers  
specific heat  
temperature  
thermohydraulics

## thermal conductivity gages

SN (GAGES FOR MEASURING THERMAL CONDUCTIVITY--EXCLUDES GAGES USING THERMAL CONDUCTIVITY TO MEASURE OTHER PROPERTIES OR VARIABLES)  
GS measuring instruments  
. **thermal conductivity gages**

RT temperature

## thermal conductors

GS conductors  
. **thermal conductors**  
RT  $\infty$  conduction  
conductive heat transfer  
electric conductors  
temperature

## thermal control coatings

GS coatings  
. **thermal control coatings**  
RT ablative materials  
 $\infty$  control  
heat shielding  
reentry shielding  
reusable heat shielding  
temperature  
temperature control  
thermochromic coatings

*thermal convection*

USE **free convection**

*thermal currents*

USE **convective flow**

## thermal cycling tests

RT closed cycles  
cooling  
environmental tests  
fatigue tests  
heating  
temperature  
temperature control  
 $\infty$  tests  
thermodynamic properties

## thermal decomposition

DEF The breaking apart of complex molecules into simpler units by the application of heat.  
GS chemical reactions  
. **thermal decomposition**  
. . pyrolysis  
decomposition  
. **thermal decomposition**  
. . pyrolysis  
RT ablation  
endothermic reactions  
exothermic reactions  
temperature  
thermochemistry  
thermogravimetry

*thermal defocusing*

USE **thermal blooming**

## thermal degradation

DEF Impairment of properties caused by exposure to heat.  
GS degradation  
. **thermal degradation**  
RT pyrolysis  
sterilization effects  
temperature  
temperature dependence  
temperature effects

## thermal diffusion

GS diffusion  
. **thermal diffusion**  
thermodynamic properties  
. thermophysical properties  
. . **thermal diffusion**  
RT Chapman-Enskog theory  
 $\infty$  conduction  
convective flow  
electron diffusion  
gas heating  
gaseous diffusion  
heat transfer  
Kirkendall effect  
Peclet number  
 $\infty$  separation  
Soret coefficient  
surface diffusion  
temperature  
thermochemistry

thermohydraulics  
viscosity

**thermal diffusivity**

DEF The ratio of thermal conductivity of a substance to the product of its density and specific heat. Common units for this property are sq cm/s or sq ft/h.

GS thermodynamic properties  
. thermophysical properties  
. . . **thermal diffusivity**  
transport properties

. **thermal diffusivity**  
RT photothermal deflection spectroscopy  
temperature  
viscosity

**thermal dissociation**

GS chemical reactions  
. **thermal dissociation**  
dissociation

. **thermal dissociation**  
RT cracking (chemical engineering)  
decomposition  
degradation  
gas dissociation  
heat of dissociation  
hydrogen production  
ionization  
plasmas (physics)  
temperature  
temperature effects

*thermal effects*

USE **temperature effects**

*thermal efficiency*

USE **thermodynamic efficiency**

**thermal emission**

DEF The process by which a body emits electromagnetic radiation as a consequence of its temperature only.

GS emission  
. **thermal emission**  
. . . thermionic emission

RT electron emission  
emissivity  
exhaust emission  
incandescence  
infrared absorption  
temperature

**thermal energy**

UF *thermal agitation*

RT cogeneration

∞ energy  
free energy  
geothermal energy conversion  
geothermal resources  
heat  
heat of fusion  
heat of solution  
internal energy  
kinetic energy  
lattice vibrations  
photothermal conversion  
solar thermal electric power plants  
temperature  
thermophotovoltaic conversion

*thermal energy storage*

USE **heat storage**

**thermal environments**

GS environments  
. **thermal environments**

RT adiabatic conditions  
aerospace environments  
heat stroke  
high temperature environments  
life support systems  
low temperature environments  
lunar environment  
planetary environments  
satellite temperature  
spacecraft environments  
temperature

thermal comfort

**thermal expansion**

DEF The increase in the dimensions or the volume of a body due to change in temperature.

GS expansion  
. **thermal expansion**  
thermodynamic properties

. **thermal expansion**  
RT Boussinesq approximation  
dilatometry  
extensometers  
Grüneisen constant  
heat transfer  
high temperature tests  
low temperature tests  
neel temperature  
∞ physical properties  
temperature  
thermal buckling  
thermophysical properties  
warpage

**thermal fatigue**

DEF In metals, fracture resulting from the presence of temperature gradients which vary with time in such a manner as to produce cyclic stresses in a structure.

UF *high temperature fatigue*

GS fatigue (materials)

. **thermal fatigue**  
RT high temperature environments  
metal fatigue  
temperature

*thermal gravimetry*

USE **thermogravimetry**

**thermal instability**

DEF The conditions of temperature gradient, thermal conductivity, and viscosity which lead to the onset of convection in a fluid.

GS thermodynamic properties  
. **thermal instability**

RT clear air turbulence  
combustion stability  
magnetohydrodynamic stability  
pyrolysis  
sputtering  
stellarators  
temperature

**thermal insulation**

DEF A material applied to reduce the flow of heat.

GS insulation  
. **thermal insulation**

RT air conditioning  
Amberlite (trademark)  
asbestos  
cork (materials)  
cryogenic fluid storage  
heat  
heat shielding  
heat sinks  
heat transfer  
heat transmission  
heating equipment  
reentry shielding  
refractories  
refractory coatings  
temperature  
temperature control  
Trombe walls

*thermal lenses*

(added November 1998)

USE **thermal lensing**

**thermal lensing**

(added November 1998)

UF *thermal lenses*

GS **thermal lensing**  
. thermal blooming

RT atmospheric optics  
focusing  
laser beams  
photothermal deflection spectroscopy

wave front deformation

**thermal mapping**

GS mapping

. **thermal mapping**  
RT aerial reconnaissance  
Earth resources  
geothermal anomalies  
geothermal resources  
Heat Capacity Mapping Mission  
infrared radiometers  
infrared scanners  
isothermal layers  
isotherms  
photomapping  
planetary mapping  
quantum well infrared photodetectors  
temperature  
temperature distribution  
temperature gradients  
thermography

**thermal neutrons**

DEF Neutrons in thermal equilibrium with the medium in which they exist. Used for slow neutrons.

UF *slow neutrons*

GS nuclear radiation

. **thermal neutrons**  
particles  
. elementary particles  
. . . fermions  
. . . . neutrons  
. . . . **thermal neutrons**  
. neutral particles  
. . . neutrons  
. . . **thermal neutrons**

RT baryons  
fast neutrons  
nuclear reactors  
temperature  
thermalization (energy absorption)

**thermal noise**

DEF The noise at radiofrequency caused by thermal agitation in a dissipative body. Also called Johnson noise.

GS elastic waves  
. sound waves  
. . noise (sound)  
. . . **thermal noise**  
electromagnetic interference  
. radio frequency interference  
. . electromagnetic noise  
. . . white noise  
. . . **thermal noise**

RT channel noise  
electromagnetic noise measurement  
noise temperature  
shot noise  
temperature

**thermal plasmas**

GS particles  
. charged particles  
. . energetic particles  
. . . plasmas (physics)  
. . . . **thermal plasmas**  
. corpuscular radiation  
. . energetic particles  
. . . plasmas (physics)  
. . . . **thermal plasmas**  
RT electron plasma  
high temperature plasmas  
plasma generators  
plasma temperature  
temperature

**thermal pollution**

DEF Environmental temperature rise due to waste heat disposal.

GS pollution

. **thermal pollution**  
RT biological effects  
coastal ecology  
environment effects  
environment pollution  
environmental quality  
environmental surveys  
environments



## thermal protection

heat transfer  
lakes  
liquid cooling  
marine biology  
nuclear reactors  
ocean temperature  
oceans  
plankton  
pollution transport  
seas  
temperature  
water pollution  
water temperature

### *thermal power*

USE **turbogenerators**

### *thermal properties*

USE **thermodynamic properties**

### **thermal protection**

GS protection  
. **thermal protection**  
RT ablative materials  
carbon-carbon composites  
heat shielding  
Ludox (trademark)  
radiation protection  
reentry shielding  
reusable heat shielding  
temperature

### **thermal radiation**

SN (EMITTED AS THE RESULT OF THERMAL EXCITATION OF MOLECULES)  
DEF The electromagnetic radiation emitted by any substance as the result of the thermal excitation of its molecules. Thermal radiation ranges in wavelength from the longest infrared radiation to the shortest ultraviolet radiation.  
GS electromagnetic radiation  
. **thermal radiation**  
. . . black body radiation  
. . . phonon beams  
RT concentrators  
greenhouse effect  
heat  
infrared radiation  
light (visible radiation)  
near infrared radiation  
nongray gas  
nonthermal radiation  
Plancks constant  
planetary radiation  
 $\infty$  radiation  
radio waves  
sky radiation  
solar radiation  
sunlight  
temperature  
thermodynamic properties  
ultraviolet radiation

### **thermal reactors**

GS nuclear reactors  
. **thermal reactors**  
RT  $\infty$  reactors  
temperature

### **thermal resistance**

DEF The extent to which a material retains useful properties as measured during exposure of the material to a specified temperature and environment for a specified time. Used for heat resistance.  
UF *heat resistance*  
GS mechanical properties  
. **thermal resistance**  
RT carbon-carbon composites  
 $\infty$  high resistance  
high temperature lubricants  
high temperature tests  
 $\infty$  low resistance  
oxidation  
oxidation resistance  
 $\infty$  resistance  
specific heat  
temperature  
temperature effects

thermodynamic properties

### **thermal resources**

GS heat sources  
. **thermal resources**  
. . . geothermal resources  
. . . . geysers  
resources  
. Earth resources  
. . **thermal resources**  
. . . . geothermal resources  
. . . . . geysers  
RT agrometeorology  
atmospheric temperature  
crop growth  
crop vigor  
geothermal technology  
resources management  
temperature  
temperature distribution

### *thermal shielding*

USE **heat shielding**

### **thermal shock**

DEF The development of a steep temperature gradient and accompanying high stresses within a structure.  
RT cooling  
heating  
high temperature tests  
 $\infty$  shock  
shock resistance  
temperature  
temperature distribution  
thermodynamic properties

### **thermal simulation**

GS simulation  
. environment simulation  
. . **thermal simulation**  
RT altitude simulation  
solar simulation  
space environment simulation  
temperature

### *thermal sinks*

USE **heat sinks**

### **thermal stability**

DEF Resistance to permanent changes in property caused solely by heat.  
UF *thermostability*  
GS stability  
. **thermal stability**  
thermodynamic properties  
. thermophysical properties  
. . **thermal stability**  
RT dimensional stability  
high temperature tests  
low temperature tests  
storage stability  
surface stability  
temperature  
temperature dependence

### **thermal stresses**

SN (EXCLUDES BIOLOGICAL STRESSES)  
DEF Stresses in metal, resulting from non-uniform temperature distribution.  
GS stresses  
. **thermal stresses**  
RT cooling  
fatigue (materials)  
heating  
temperature  
temperature distribution  
temperature effects

### **thermal vacuum tests**

GS vacuum tests  
. **thermal vacuum tests**  
RT environmental tests  
high altitude environments  
temperature  
test chambers  
 $\infty$  tests

vacuum chambers

### **thermalization (energy absorption)**

GS energy absorption  
. moderation (energy absorption)  
. . **thermalization (energy absorption)**  
. . . neutron thermalization  
RT thermal neutrons

### **thermicons**

GS electron tubes  
. camera tubes  
. . vidicons  
. . . return beam vidicons  
. . . . **thermicons**  
. image tubes  
. . **thermicons**  
optical equipment  
. image converters  
. . image tubes  
. . . **thermicons**

### **thermionic cathodes**

GS electrodes  
. cathodes  
. . tube cathodes  
. . . **thermionic cathodes**  
emitters  
. **thermionic cathodes**  
RT hot cathodes

### *thermionic conversion systems*

USE **thermionic power generation**

### **thermionic converters**

GS electric generators  
. direct power generators  
. . **thermionic converters**  
. . . SNAP 13  
. . . solar blankets  
RT cesium diodes  
cesium plasma  
 $\infty$  converters  
fuel cells  
ion production rates  
magnetohydrodynamic generators  
plasma power sources  
radioisotope batteries  
SNAP  
solar cells  
thermoelectric generators

### **thermionic diodes**

GS electron tubes  
. **thermionic diodes**  
. . cesium diodes  
electronic equipment  
. diodes  
. . **thermionic diodes**  
. . . cesium diodes  
RT Child-Langmuir law  
perveance  
semiconductor diodes

### **thermionic emission**

DEF Direct ejection of electrons as the result of heating the material, which raises electron energy beyond the binding energy that holds the electron to the material. Used for Richardson-Dushman equation.  
UF *Richardson-Dushman equation*  
GS emission  
. particle emission  
. . **thermionic emission**  
. thermal emission  
. . **thermionic emission**  
RT electron emission  
ion emission  
thermoelectricity  
work functions

### **thermionic emitters**

GS emitters  
. **thermionic emitters**

### **thermionic power generation**

UF *thermionic conversion systems*  
RT  $\infty$  conversion  
SNAP

SNAP 13

*thermionic reactors*USE **ion engines**  
**nuclear rocket engines****thermionics**

DEF The study of the emission of electrons by heat.

RT cathodes  
electron emission  
∞ electronics  
ion emission**thermistors**

DEF Electron devices employing the temperature dependent change of resistivity of a semiconductor.

GS attenuators  
. resistors  
. . . **thermistors**  
electronic equipment  
. solid state devices  
. . . semiconductor devices  
. . . **thermistors**  
temperature sensors  
. **thermistors**  
RT radiometers  
temperature measuring instruments  
varistors**thermites**

DEF Fire-hazardous mixtures of ferric oxide and powdered aluminum; upon ignition with a magnesium ribbon, the mixtures reach temperatures up to 4000 degrees F (sufficient to soften steel).

RT aluminum oxides  
Auger spectroscopy  
barium ion clouds  
copper oxides  
ignition temperature  
pyrotechnics**thermoacoustic effects***(added May 2000)*

DEF Phenomena associated with the combination of temperature, pressure and displacement oscillations caused by acoustic waves interacting with solid boundaries, such as the walls of a tube or a "stack".

RT acoustic excitation  
acoustic instability  
acoustics  
acousto-optics  
combustion stability  
∞ effects  
heat transfer  
sound waves  
thermoacoustic refrigerators  
thermophysical properties**thermoacoustic refrigerators***(added May 2000)*

DEF Cooling devices in which intense sound waves in pressurized resonant cavities are used to generate temperature gradients in an array of parallel plates in the interior of a tube that serves as a heat exchanger and in which heat is drawn away by a heat sink.

GS refrigerating machinery  
. refrigerators  
. . . **thermoacoustic refrigerators**  
RT cooling systems  
refrigerating  
thermoacoustic effects**thermobalances**GS measuring instruments  
. indicating instruments  
. . . weight indicators  
. . . **thermobalances**  
RT thermogravimetry**thermocapillary migration***(added September 1999)*

DEF Phenomenon where droplets (or bubbles) in a host fluid with a uniform temperature gradient migrate to the hot end of the host fluid because of the temperature dependence of

the interfacial energy of the droplets.

RT bubbles  
capillary flow  
drops (liquids)  
electromigration  
interfacial tension  
Marangoni convection  
microgravity  
space processing  
temperature gradients  
thermomigration**thermochemical properties**GS chemical properties  
. **thermochemical properties**  
. . . heat of combustion  
. . . heat of dissociation  
. . . heat of formation  
. . . heat of solution  
. . . latent heat  
. . . . heat of fusion  
. . . . heat of vaporization  
thermodynamic properties  
. **thermochemical properties**  
. . . heat of combustion  
. . . heat of dissociation  
. . . heat of formation  
. . . heat of solution  
. . . latent heat  
. . . . heat of fusion  
. . . . heat of vaporization  
RT heat balance  
∞ properties**thermochemistry**

DEF A branch of chemistry that treats the relations of heat and chemical changes.

GS **thermochemistry**  
. aerothermochemistry  
. combustion chemistry  
RT chemical engineering  
chemical reactions  
∞ chemistry  
combustion physics  
enthalpy  
entropy  
heat  
heat balance  
heat of dissociation  
heat of fusion  
heat of solution  
heat treatment  
physical chemistry  
propellant chemistry  
pyrometallurgy  
thermal decomposition  
thermal diffusion  
thermodynamic properties  
thermodynamics  
thermogravimetry  
thermophysical properties  
water splitting**thermochromatic materials**GS **thermochromatic materials**  
. thermochromic coatings  
RT color  
colorimetry  
∞ inorganic materials  
∞ materials  
optical properties  
organic materials  
solids**thermochromic coatings***(added March 2005)*

DEF Spectrally selective coatings that change their transmission and reflection properties with temperature.

UF *thermochromic films*  
GS coatings  
. **thermochromic coatings**  
smart materials  
. **thermochromic coatings**  
thermochromatic materials  
. **thermochromic coatings**  
RT energy absorption films  
energy conservation  
light transmission  
reflectanceselective surfaces  
temperature control  
temperature sensitive paints  
thermal control coatings  
thin films  
transmittance  
vanadium oxides*thermochromic films**(added March 2005)*USE **thermochromic coatings****thermoclines**GS gradients  
. temperature gradients  
. . . **thermoclines**  
RT oceanography  
sea water  
sound transmission  
stratification  
surface layers  
surface temperature  
thermohaline circulation  
underwater acoustics**thermocouple pyrometers**GS measuring instruments  
. temperature measuring instruments  
. . . pyrometers  
. . . **thermocouple pyrometers**  
RT galvanometers  
potentiometers (instruments)  
radiation pyrometers  
resistance thermometers  
temperature measurement  
thermocouples  
thermoelement ammeters**thermocouples**

DEF Devices which convert thermal energy directly into electrical energy. In its basic form it consists of two dissimilar metallic electrical conductors connected in a closed loop. Each junction forms a thermocouple.

GS **thermocouples**  
. thermopiles  
RT constantan  
indicating instruments  
Manganin (trademark)  
Peltier effects  
potentiometers (instruments)  
Seebeck effect  
temperature measurement  
temperature measuring instruments  
temperature probes  
thermocouple pyrometers  
thermoelectric generators  
thermoelectricity**thermodynamic coupling**GS coupling  
. **thermodynamic coupling**  
RT BCS theory  
electron phonon interactions  
superconductors (materials)**thermodynamic cycles**GS cycles  
. **thermodynamic cycles**  
. . . Brayton cycle  
. . . Carnot cycle  
. . . Otto cycle  
. . . Rankine cycle  
. . . Stirling cycle  
RT adiabatic conditions  
closed cycles  
heat engines  
internal combustion engines  
laser propulsion  
∞ strokes  
thermodynamics**thermodynamic efficiency**

DEF In thermodynamics, the ratio of the work done by a heat engine to the total heat supplied by the heat source. Used for thermal efficiency.

UF *thermal efficiency*  
GS efficiency  
. **thermodynamic efficiency**

## thermodynamic equilibrium

RT combustion efficiency  
compressor efficiency  
engines  
exergy  
heat sources  
internal combustion engines  
nozzle efficiency  
power efficiency  
propulsion system performance  
propulsive efficiency  
specific impulse  
temperature  
thermodynamics

### thermodynamic equilibrium

DEF A very general result from statistical mechanics which states that if a system is in equilibrium, all processes which can exchange energy must be exactly balanced by the reverse process so that there is no net exchange of energy.

RT acid base equilibrium  
adiabatic conditions  
chemical equilibrium  
∞ equilibrium  
heat of dissociation  
isentropic processes  
isochoric processes  
isoenergetic processes  
isothermal processes  
liquid-vapor equilibrium  
local thermodynamic equilibrium  
statistical mechanics

### thermodynamic properties

UF *thermal properties*  
GS **thermodynamic properties**  
. enthalpy  
. . Gibbs free energy  
. . heat of dissociation  
. . heat of formation  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
. entropy  
. free energy  
. . Gibbs free energy  
. surface energy  
. thermal expansion  
. thermal instability  
. thermochemical properties  
. . heat of combustion  
. . heat of dissociation  
. . heat of formation  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
. thermophysical properties  
. . critical point  
. . critical pressure  
. . critical temperature  
. . emissivity  
. . fusibility  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
. . melting points  
. . pyroelectricity  
. . specific heat  
. . supercritical pressures  
. . thermal conductivity  
. . thermal diffusion  
. . thermal diffusivity  
. . thermal stability  
. . vapor pressure  
. . volatility

RT chemical properties  
diffusivity  
emittance  
∞ equilibrium  
exergy  
heat  
heat balance  
high temperature tests  
Joule-Thomson effect  
optical properties

∞ physical properties  
Prandtl number  
propellant properties  
∞ properties  
∞ Seebeck effect  
solubility  
temperature  
tephigrams  
thermal cycling tests  
thermal radiation  
thermal resistance  
thermal shock  
thermochemistry  
thermodynamics  
thermoluminescence  
zero point energy

### thermodynamics

DEF Study and application of principles describing the relation of heat transfer to various forms of energy, and the behaviors of physical systems where temperature is a significant feature. Used for heat equations, thermomechanics, and thermophysics.

UF *heat equations*  
*thermomechanics*  
*thermophysics*

#### GS thermodynamics

. aerothermodynamics  
. combustion physics  
. nonequilibrium thermodynamics

RT aerodynamics

∞ dynamics  
engines  
enthalpy  
entropy  
∞ equations  
equations of state  
∞ equilibrium  
ergodic process  
exergy  
fluid mechanics  
free energy  
gas dynamics  
heat  
heat of fusion  
heat of solution  
heat transfer  
internal energy  
irreversible processes  
isotherms  
Joule-Thomson effect  
Kirchhoff law of radiation  
mechanical engineering  
molecular relaxation  
Mollier diagram  
nonadiabatic conditions  
nongray gas  
nonisothermal processes  
Onsager relationship  
∞ paths  
Pfaff equation  
photothermal conversion  
physical chemistry  
plasma physics  
plasmas (physics)  
polytropic processes  
Rankine cycle  
Rayleigh equations  
steam  
thermochemistry  
thermodynamic cycles  
thermodynamic efficiency  
thermodynamic properties  
thermoelectric cooling  
unsteady state

### thermoelasticity

DEF Dependence of the stress distribution of an elastic solid on its thermal state, or of its thermal conductivity on the stress distribution.

GS mechanical properties  
. elastic properties  
. . **thermoelasticity**  
. . . aerothermoelasticity

RT aeroelasticity  
aerothermodynamics  
hydroelasticity  
thermoelectric generators

thermoelectric materials

*thermoelectric conversion systems*

USE **thermoelectric power generation**

### thermoelectric cooling

UF *Ettingshausen coolers*  
GS cooling  
. **thermoelectric cooling**  
RT cryogenics  
Ettingshausen effect  
heat pumps  
Peltier effects  
refrigerating  
refrigerating machinery  
thermodynamics  
thermoelectricity  
thermomagnetic cooling

### thermoelectric generators

GS electric generators  
. direct power generators  
. . **thermoelectric generators**  
. . . SNAP 3  
. . . SNAP 7  
. . . SNAP 9A  
. . . SNAP 10A  
. . . SNAP 11  
. . . SNAP 15  
. . . SNAP 17  
. . . SNAP 19  
. . . SNAP 21  
. . . SNAP 23  
. . . SNAP 27  
. . . SNAP 29  
. . . solar sea power plants  
RT ASTEC solar turboelectric generator  
fuel cells  
∞ generators  
magnetohydrodynamic generators  
nuclear auxiliary power units  
photoelectric generators  
radioisotope batteries  
SNAP  
solar cells  
solar generators  
space station power supplies  
thermionic converters  
thermocouples  
thermoelasticity  
thermoelectricity

### thermoelectric materials

RT ∞ materials  
semiconductors (materials)  
thermoelasticity  
thermoelectricity

*Thermoelectric Outer Planet Spacecraft*

USE **TOPS (spacecraft)**

### thermoelectric power generation

UF *thermoelectric conversion systems*  
RT ∞ conversion  
nuclear auxiliary power units  
radioisotope heat sources  
SNAP  
thermoelectricity

*thermoelectric spacecraft*

USE **TOPS (spacecraft)**

### thermoelectricity

UF *Thomson effect*  
RT Ettingshausen effect  
Peltier effects  
Seebeck effect  
thermionic emission  
thermocouples  
thermoelectric cooling  
thermoelectric generators  
thermoelectric materials  
thermoelectric power generation  
thermopiles  
transport properties

### thermoelement ammeters

GS measuring instruments  
. ammeters  
. . **thermoelement ammeters**

- RT thermocouple pyrometers
- thermograms*
- USE **recording instruments**  
**temperature measuring instruments**
- thermography**
- DEF Technique employing heat transfer transients.
- RT infrared imagery  
nondestructive tests  
quantum well infrared photodetectors  
temperature distribution  
temperature measurement  
thermal mapping
- thermogravimetry**
- UF *thermal gravimetry*
- RT chemical analysis  
dehydration  
pyrolysis  
temperature effects  
thermal decomposition  
thermobalances  
thermochemistry
- thermohaline circulation**  
(added February 2002)
- DEF Any water movements, including convection and large-scale currents, due to the joint action of temperature and salinity.
- UF *THC (oceanography)*
- GS circulation  
. water circulation  
. . **thermohaline circulation**
- RT ocean currents  
ocean dynamics  
ocean temperature  
salinity  
sea water  
thermoclines  
upwelling water
- thermo hydraulics**
- RT convective heat transfer  
fluid dynamics  
fluid flow  
heat transmission
- ∞ hydraulics  
hydrodynamics  
laminar heat transfer  
radiative heat transfer  
thermal conductivity  
thermal diffusion  
turbulent heat transfer
- thermoluminescence**
- GS emission  
. light emission  
. . luminescence  
. . . **thermoluminescence**
- RT temperature effects  
thermodynamic properties
- thermomagnadynamics*
- USE **thermomagnetic effects**
- thermomagnetic cooling**
- UF *Nernst generators*
- GS cooling  
. **thermomagnetic cooling**
- RT cryogenics  
Ettingshausen effect  
thermoelectric cooling
- thermomagnetic effects**
- UF *thermomagnadynamics*  
*thermomagnetism*
- GS magnetic properties  
. **thermomagnetic effects**
- RT ∞ effects  
Ettingshausen effect  
Nernst-Ettingshausen effect
- thermomagnetism*
- USE **thermomagnetic effects**
- thermomechanical treatment**
- DEF Combination of material-forming processes with heat treatments in order to obtain specific material properties.
- GS **thermomechanical treatment**  
. hot pressing  
. . hot isostatic pressing
- RT heat affected zone  
heat treatment
- ∞ metallurgy  
microstructure  
plastic deformation  
quenching (cooling)
- ∞ treatment
- thermomechanics*
- USE **thermodynamics**
- thermometers**
- DEF Devices for measuring temperature.
- GS measuring instruments  
. temperature measuring instruments  
. . **thermometers**  
. . . resistance thermometers
- RT temperature control  
temperature measurement  
temperature scales
- thermometry*
- USE **temperature measurement**
- thermomigration**
- DEF A technique for doping semiconductors in which exact amounts of known impurities are made to migrate from the cool side of a wafer of pure semiconductor material to the hotter side when the wafer is heated in an oven.
- RT electromigration  
heat transfer  
temperature gradients  
thermocapillary migration
- thermonuclear energy*
- USE **thermonuclear power generation**
- thermonuclear explosions**
- GS explosions  
. nuclear explosions  
. . **thermonuclear explosions**
- RT aerial explosions  
Argus project  
fission weapons  
nuclear devices  
nuclear vulnerability  
underground explosions  
underwater explosions
- thermonuclear power generation**
- UF *thermonuclear energy*
- GS nuclear electric power generation  
. **thermonuclear power generation**
- RT Astron thermonuclear reactor  
controlled fusion  
electric generators
- ∞ energy  
pinch effect  
plasma generators  
stellarators  
zeta thermonuclear reactor
- thermonuclear propulsion*
- USE **nuclear propulsion**
- thermonuclear reactions**
- GS nuclear reactions  
. **thermonuclear reactions**  
. . nuclear fusion  
. . . controlled fusion
- RT Astron thermonuclear reactor  
high energy interactions  
magnetohydrodynamics  
pinch effect  
plasmas (physics)  
proton-proton reactions  
Q values (nuclear physics)  
radioactive decay  
Scylla  
stellarators  
zeta thermonuclear reactor
- thermophiles**
- RT algae  
fungi
- mesophiles  
psychrophiles
- thermophilic plants**
- GS plants (botany)  
. **thermophilic plants**  
. . blue green algae  
. . . anabaena  
. . . Microcystis  
. . . Nostoc
- RT algae
- thermophoresis**
- DEF A process in which particles migrate in a gas under the influence of forces created by a temperature gradient.
- RT aerosols  
deposition  
diffusion  
particle diffusion  
particle motion  
particle size distribution
- ∞ separation  
temperature effects  
temperature gradients
- thermophotovoltaic conversion**  
(added May 1995)
- DEF A technique for efficiently converting heat or solar energy to electrical energy using heated surfaces coated with a selective emitter material whose photon emission peaks sharply in a narrow wavelength.
- GS energy conversion  
. solar energy conversion  
. . photothermal conversion  
. . . **thermophotovoltaic conversion**  
. . photovoltaic conversion  
. . . **thermophotovoltaic conversion**
- RT emitters  
energy conversion efficiency  
solar cells  
spacecraft power supplies  
thermal energy
- thermophysical properties**
- GS thermodynamic properties  
. **thermophysical properties**  
. . critical point  
. . critical pressure  
. . critical temperature  
. . emissivity  
. . fusibility  
. . heat of solution  
. . latent heat  
. . . heat of fusion  
. . . heat of vaporization  
. . melting points  
. . pyroelectricity  
. . specific heat  
. . supercritical pressures  
. . thermal conductivity  
. . thermal diffusion  
. . thermal diffusivity  
. . thermal stability  
. . vapor pressure  
. . volatility
- RT Peltier effects
- ∞ properties  
Seebeck effect  
surface energy  
thermal expansion  
thermoacoustic effects  
thermochemistry
- thermophysics*
- USE **thermodynamics**
- thermopiles**
- DEF Transducers for converting thermal energy directly into electrical energy, composed of pairs of thermocouples which are connected either in series or in parallel. Batteries of thermocouples connected in series to form single compact units.
- GS thermocouples  
. **thermopiles**  
transducers  
. **thermopiles**
- RT Dicke radiometers

## thermoplastic films

indicating instruments  
temperature measuring instruments  
thermoelectricity

### thermoplastic films

DEF Materials with a linear macromolecular structure that will repeatedly soften when heated and harden when cooled.

GS plastics  
. synthetic resins  
. . . thermoplastic resins  
. . . . **thermoplastic films**  
resins  
. synthetic resins  
. . . thermoplastic resins  
. . . . **thermoplastic films**  
RT ∞ films

### thermoplastic resins

GS plastics  
. synthetic resins  
. . . **thermoplastic resins**  
. . . . PEEK  
. . . . quinoxalines  
. . . . thermoplastic films  
resins  
. synthetic resins  
. . . **thermoplastic resins**  
. . . . PEEK  
. . . . quinoxalines  
. . . . thermoplastic films  
RT acrylic resins  
glass fiber reinforced plastics  
polyethylenes  
polymer blends  
polystyrene  
thermoplasticity  
thermosetting resins  
vulcanized elastomers

### thermoplasticity

GS mechanical properties  
. plastic properties  
. . . **thermoplasticity**  
RT Bouguer law  
temperature effects  
thermoplastic resins

### thermoreceptors

GS anatomy  
. sense organs  
. . . **thermoreceptors**  
receptors (physiology)  
. **thermoreceptors**  
RT body temperature  
sensitometry  
skin (anatomy)  
thermoregulation

### thermoregulation

DEF A mechanism by which mammals and birds balance heat gain and loss in order to maintain a constant body temperature. Used for body temperature regulation.

UF *body temperature regulation*  
RT body temperature  
cold tolerance  
hibernation  
homeostasis  
hyperthermia  
hypothermia  
metabolism  
physiology  
regulatory mechanisms (biology)  
temperature control  
thermoreceptors

### thermosetting resins

GS plastics  
. synthetic resins  
. . . **thermosetting resins**  
. . . . epoxy resins  
. . . . phenolic epoxy resins  
. . . . furan resins  
. . . . polyamide resins  
. . . . . Kevlar (trademark)  
. . . . . Nylon (trademark)  
. . . . phenolic resins  
. . . . . micarta  
. . . . phenolic epoxy resins

resins  
. synthetic resins  
. . . **thermosetting resins**  
. . . . epoxy resins  
. . . . . phenolic epoxy resins  
. . . . furan resins  
. . . . polyamide resins  
. . . . . Kevlar (trademark)  
. . . . . Nylon (trademark)  
. . . . phenolic resins  
. . . . . micarta  
. . . . phenolic epoxy resins  
RT Bakelite (trademark)  
composite materials  
formica  
glass fiber reinforced plastics  
laminates  
polyester resins  
reinforced plastics  
silicone resins  
thermoplastic resins

### thermosiphons

GS regenerators  
. **thermosiphons**  
RT convective heat transfer  
free convection  
∞ radiators  
siphoning

### thermosphere

SN (ALTITUDES ABOVE APPROXIMATELY 80 KM)  
GS Earth atmosphere  
. upper atmosphere  
. . . **thermosphere**  
. . . . turbopause  
RT chemosphere  
Earth ionosphere  
Earth magnetosphere  
exosphere  
heterosphere  
homosphere

### thermostability

USE **thermal stability**

### thermostats

GS control equipment  
. regulators  
. . . **thermostats**  
switches  
. electric switches  
. . . **thermostats**  
RT automatic control  
controllers  
cryostats  
temperature control  
temperature measuring instruments

### thermotropism

USE **anisotropy**  
**temperature effects**

### thermoviscoelasticity

GS mechanical properties  
. elastic properties  
. . . viscoelasticity  
. . . . **thermoviscoelasticity**  
RT irreversible processes  
stress-strain-time relations

### thesauri

RT indexes (documentation)  
indexing (information science)  
information retrieval  
KWIC indexes  
nomenclatures  
space glossaries  
terminology  
terms  
words (language)

### theses

GS documents  
. **theses**  
RT hypotheses

### theta pinch

GS pinch effect  
. plasma pinch

. . . **theta pinch**  
RT laser plasma interactions  
plasma compression  
rotating plasmas  
screw pinch  
zeta pinch

### thiamine

UF *vitamin B*  
GS organic compounds  
. coenzymes  
. . . **thiamine**  
. cyclic compounds  
. . . heterocyclic compounds  
. . . . **thiamine**  
vitamins  
. **thiamine**

### thiazine (trademark)

GS dyes  
. **thiazine (trademark)**  
nitrogen compounds  
. **thiazine (trademark)**  
organic compounds  
. cyclic compounds  
. . . heterocyclic compounds  
. . . . **thiazine (trademark)**  
sulfur compounds  
. **thiazine (trademark)**

### thick films

RT electronic packaging  
∞ films  
integrated circuits  
microminiaturization  
printed circuits  
semiconducting films  
superconducting films  
thin films

### thick plates

DEF Plates of steel or other material that are over two inches thick. The exact definition of dimensions that constitute thickness varies.

GS structural members  
. plates (structural members)  
. . . **thick plates**  
RT flat plates  
metal plates  
Mindlin plates  
∞ plates  
∞ sheets  
thickness  
thin plates

### thick walls

GS walls  
. **thick walls**  
RT boiler plate  
bulkheads  
reinforcement (structures)  
structural members  
thin walls  
wall pressure  
wall temperature

### ∞ thickeners

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT thickeners (equipment)  
thickeners (materials)

### thickeners (equipment)

GS separators  
. classifiers  
. . . **thickeners (equipment)**  
RT coalescing  
precipitators  
∞ thickeners

### thickeners (materials)

RT additives  
gels  
greases  
∞ materials  
∞ thickeners

### thickness

GS **thickness**  
. boundary layer thickness

- RT airfoil profiles
  - depth
  - diameters
  - dimensions
  - film thickness
  - length
  - optical thickness
  - spacing
  - target thickness
  - thick plates
  - thickness ratio
  - volume
- thickness ratio**
  - GS ratios
    - . aspect ratio
    - . . **thickness ratio**
  - RT airfoil profiles
    - airfoils
    - dimensional analysis
    - fineness ratio
    - thickness
    - thin airfoils
    - thin wings
- thigh**
  - GS anatomy
    - . limbs (anatomy)
    - . . leg (anatomy)
    - . . . **thigh**
    - appendages
      - . leg (anatomy)
      - . . **thigh**
- thin airfoils**
  - GS airfoils
    - . **thin airfoils**
    - . . thin wings
    - . . . infinite span wings
  - RT airfoil profiles
    - thickness ratio
- ∞ **thin bodies**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT slender bodies
    - thin plates
    - thin walls
    - thin wings
- thin films**
  - SN (SOLID STATE PHYSICS AND ELECTRONICS)
  - DEF Films having a thickness much smaller than any lateral dimension, formed by deposition of a material or by a thinning process.
  - GS **thin films**
    - . diamond films
    - . energy absorption films
    - . ferromagnetic films
    - . monomolecular films
    - . . Langmuir-Blodgett films
  - RT amorphous silicon
    - atomic force microscopy
    - atomic layer epitaxy
    - carbon nitrides
    - coatings
    - computer storage devices
    - copper indium selenides
    - electrochromism
    - electrode film barriers
    - ferroelectric materials
  - ∞ films
    - heterojunctions
    - indium selenides
    - integrated circuits
    - integrated optics
    - ion plating
    - Langmuir turbulence
    - metal films
    - microchannel plates
    - microminiaturization
    - miniature electronic equipment
    - molecular electronics
    - nanoparticles
    - oxide films
    - parametrons
    - pellicle
    - plating
    - praetersonic devices
- rectifiers
- semiconducting films
- silicon films
- solid state devices
- ∞ solid state physics
  - sputtering gages
  - squeeze films
  - superconducting films
  - thermochromic coatings
  - thick films
  - wafers
  - YBCO superconductors
  - yttria-stabilized zirconia
- thin layer chromatography**
  - GS chemical tests
    - . chemical analysis
    - . . chromatography
    - . . . **thin layer chromatography**
  - RT gas chromatography
    - monomolecular films
- thin plates**
  - SN (EXCLUDES THIN SURFACE COATINGS AND FILMS)
  - GS structural members
    - . plates (structural members)
    - . . **thin plates**
  - RT diaphragms (mechanics)
    - flat plates
    - foils (materials)
    - metal plates
    - panels
    - parallel plates
    - ∞ plates
    - ∞ sheets
    - thick plates
    - ∞ thin bodies
- thin walled shells**
  - GS shells (structural forms)
    - . **thin walled shells**
  - RT cylindrical shells
    - membrane structures
    - metal shells
    - orthotropic shells
    - reinforced shells
    - skin (structural member)
    - spherical shells
    - stressed-skin structures
    - toroidal shells
- thin walls**
  - GS walls
    - . **thin walls**
  - RT bulkheads
    - diaphragms (mechanics)
    - partitions (structures)
    - skin (structural member)
    - thick walls
    - ∞ thin bodies
- thin wings**
  - GS airfoils
    - . thin airfoils
    - . . **thin wings**
    - . . . infinite span wings
    - . wings
    - . . . **thin wings**
    - . . . infinite span wings
  - RT airfoil profiles
    - fixed wings
    - flexible wings
    - thickness ratio
    - ∞ thin bodies
    - uncambered wings
- thinners*
  - USE **solvents**
- thiols**
  - UF *dithiols*
    - mercaptan*
    - mercapto compounds*
  - GS sulfur compounds
    - . **thiols**
    - . . cysteine
    - . . dimercaprol
  - RT alcohols
    - ∞ chemical compounds
- phenols
- thiophenes**
  - (added January 1995)
  - GS organic compounds
    - . cyclic compounds
    - . . heterocyclic compounds
    - . . . **thiophenes**
  - RT benzene
    - drugs
    - furans
    - pyrroles
- thioplastics**
  - RT elastomers
    - plastics
    - sulfides
- thioureas**
  - GS nitrogen compounds
    - . amides
    - . . ureas
    - . . . **thioureas**
- thiuronium**
  - GS nitrogen compounds
    - . amides
    - . . ureas
    - . . . **thiuronium**
    - organic compounds
      - . amines
      - . . **thiuronium**
- thixotropic propellants*
  - USE **gelled rocket propellants**
- thixotropy**
  - DEF The property of material that enables it to stiffen in a relatively short time on standing, but upon agitation or manipulation to change to a very soft consistency or to a fluid of high viscosity, the process being completely reversible.
    - RT gelation
      - gels
      - liquefaction
      - nonNewtonian flow
    - ∞ physical properties
      - semisolids
      - solubility
      - viscosity
- Thomas-Fermi model**
  - UF *Thomas-Fermi theory*
  - GS models
    - . mathematical models
    - . . **Thomas-Fermi model**
  - RT atomic structure
    - electron distribution
    - plasma composition
    - quantum statistics
- Thomas-Fermi theory*
  - USE **Thomas-Fermi model**
- Thomson effect*
  - USE **thermoelectricity**
- Thomson scattering**
  - GS scattering
    - . wave scattering
    - . . electromagnetic scattering
    - . . . **Thomson scattering**
  - RT electromagnetic radiation
- Thor Able rocket vehicle**
  - GS launch vehicles
    - . Thor launch vehicles
    - . . **Thor Able rocket vehicle**
    - . Thorad launch vehicles
    - . . **Thor Able rocket vehicle**
    - rocket vehicles
      - . multistage rocket vehicles
      - . . Thor launch vehicles
      - . . . **Thor Able rocket vehicle**
      - . Thorad launch vehicles
      - . . **Thor Able rocket vehicle**
  - RT Explorer 6 satellite
    - liquid propellant rocket engines
    - Pioneer 1 space probe
    - Pioneer 5 space probe

## Thor Agena launch vehicle

solid propellant rocket engines  
TIROS 1 satellite

### Thor Agena launch vehicle

GS launch vehicles  
  . Thor launch vehicles  
  . . **Thor Agena launch vehicle**  
  . Thorad launch vehicles  
  . . **Thor Agena launch vehicle**  
  rocket vehicles  
  . multistage rocket vehicles  
  . . Thor launch vehicles  
  . . . **Thor Agena launch vehicle**  
  . Thorad launch vehicles  
  . . **Thor Agena launch vehicle**  
RT Agena A rocket vehicle  
  Agena B Ranger Program  
  Agena rocket vehicles  
  Discoverer satellites  
  Explorer 31 satellite  
  Explorer 34 satellite  
  Explorer 35 satellite  
  Explorer 36 satellite  
  liquid propellant rocket engines  
  Nimbus 1 satellite  
  Nimbus 2 satellite  
  Nimbus satellites  
  OGO-3

### Thor Delta launch vehicle

UF *Echo 1 carrier rocket*  
GS launch vehicles  
  . Thor launch vehicles  
  . . **Thor Delta launch vehicle**  
  . Thorad launch vehicles  
  . . **Thor Delta launch vehicle**  
  rocket vehicles  
  . multistage rocket vehicles  
  . . Thor launch vehicles  
  . . . **Thor Delta launch vehicle**  
  . Thorad launch vehicles  
  . . **Thor Delta launch vehicle**  
RT Ariel satellites  
  Echo 1 satellite  
  Explorer satellites  
  liquid propellant rocket engines  
  OSO  
  Relay satellites  
  solid propellant rocket engines  
  SYNCOM satellites  
  Telstar satellites

### Thor launch vehicles

GS launch vehicles  
  . **Thor launch vehicles**  
  . . Thor Able rocket vehicle  
  . . Thor Agena launch vehicle  
  . . Thor Delta launch vehicle  
  rocket vehicles  
  . multistage rocket vehicles  
  . . **Thor launch vehicles**  
  . . . Thor Able rocket vehicle  
  . . . Thor Agena launch vehicle  
  . . . Thor Delta launch vehicle  
RT liquid propellant rocket engines  
  solid propellant rocket engines  
  Thorad launch vehicles  
∞ vehicles

### Thorad launch vehicles

GS launch vehicles  
  . **Thorad launch vehicles**  
  . . Thor Able rocket vehicle  
  . . Thor Agena launch vehicle  
  . . Thor Delta launch vehicle  
  rocket vehicles  
  . **Thorad launch vehicles**  
  . . Thor Able rocket vehicle  
  . . Thor Agena launch vehicle  
  . . Thor Delta launch vehicle  
RT liquid propellant rocket engines  
  Thor launch vehicles  
∞ vehicles

### thorax

GS anatomy  
  . **thorax**  
RT breast  
  chest  
  diaphragm (anatomy)

sternum  
viscera

### thorium

GS chemical elements  
  . actinide series  
  . . **thorium**  
  . . . thorium isotopes  
  metals  
  . actinide series  
  . . **thorium**  
  . . . thorium isotopes  
RT nuclear fuels

*thorium 228*

USE **thorium isotopes**

*thorium 230*

USE **thorium isotopes**

*thorium 234*

USE **thorium isotopes**

### thorium alloys

GS alloys  
  . **thorium alloys**  
RT nuclear fuels

### thorium compounds

GS actinide series compounds  
  . **thorium compounds**  
  . . thorium fluorides  
  . . thorium oxides  
RT ceramic nuclear fuels  
∞ chemical compounds  
∞ metal compounds  
  nuclear fuels

### thorium fluorides

GS actinide series compounds  
  . thorium compounds  
  . . **thorium fluorides**  
  halogen compounds  
  . fluorine compounds  
  . . fluorides  
  . . . metal fluorides  
  . . . . **thorium fluorides**  
  . halides  
  . . fluorides  
  . . . metal fluorides  
  . . . . **thorium fluorides**  
  . . metal halides  
  . . . metal fluorides  
  . . . . **thorium fluorides**

### thorium isotopes

UF *thorium 228*  
*thorium 230*  
*thorium 234*  
GS chemical elements  
  . actinide series  
  . . thorium  
  . . . **thorium isotopes**  
  . nuclides  
  . . isotopes  
  . . . **thorium isotopes**  
  metals  
  . actinide series  
  . . thorium  
  . . . **thorium isotopes**

### thorium oxides

GS actinide series compounds  
  . thorium compounds  
  . . **thorium oxides**  
  chalcogenides  
  . oxides  
  . . metal oxides  
  . . . **thorium oxides**  
RT dioxides

*thoron*

USE **radon isotopes**

### threads

SN (EXCLUDES TEXTILES AND  
  FILAMENTARY FORMS)  
RT bolts  
  nuts (fasteners)

screws

### threat evaluation

DEF The evaluation of the potential harm of an approaching aircraft or other objects.  
RT aircraft hazards  
  aircraft safety  
  collision avoidance  
  midair collisions  
  radar tracking  
  situational awareness  
  warning systems

### three axis stabilization

DEF Maintenance of a stable platform in a desired 3-axis orientation in inertial space by utilizing gyros and accelerometers and which is independent of vehicle motion.  
GS stabilization  
  . **three axis stabilization**  
RT inertial platforms  
  satellite attitude control  
  satellite orientation  
  stabilized platforms

### three body problem

DEF That problem in classical celestial mechanics which treats the motion of a small body, usually with negligible mass, relative to and under the gravitational influence of two other finite point masses.  
RT celestial mechanics  
  four body problem  
  many body problem  
  orbits  
  perturbation  
∞ problems  
  retrograde orbits  
  triple stars  
  Trojan asteroids  
  Trojan orbits  
  two body problem

### three dimensional bodies

RT aerodynamic configurations  
∞ bodies  
  boundary value problems  
  flow distribution

### three dimensional boundary layer

GS boundary layers  
  . **three dimensional boundary layer**  
RT axisymmetric flow  
  boundary layer transition  
  compressible boundary layer  
  laminar boundary layer  
∞ layers  
  secondary flow  
  turbulent boundary layer  
  velocity distribution

### three dimensional composites

GS composite materials  
  . **three dimensional composites**  
RT braided composites  
  fiber composites  
∞ materials  
  woven composites

### three dimensional flow

GS fluid flow  
  . parallel flow  
  . . **three dimensional flow**  
  . . . Karman-Bodewadt flow  
  . . . secondary flow  
  translational motion  
  . three dimensional motion  
  . . **three dimensional flow**  
  . . . Karman-Bodewadt flow  
  . . . secondary flow  
RT axial flow  
  conical flow  
  flow geometry  
  helical flow  
  one dimensional flow  
  Roshko prediction  
  spherical waves  
  two dimensional flow

wedge flow

**three dimensional models**

(added August 1988)

- GS models
  - . **three dimensional models**
- RT computational grids
  - computer aided design
  - computerized simulation
  - mathematical models
  - rapid prototyping
  - two dimensional models

**three dimensional motion**

- GS translational motion
  - . **three dimensional motion**
  - . . three dimensional flow
  - . . . Karman-Bodewadt flow
  - . . . secondary flow
- RT degrees of freedom
  - optical flow (image analysis)

**threshold currents**

- GS electric current
  - . **threshold currents**
- RT lasers
  - threshold voltage
- ∞ thresholds

**threshold detectors (dosimeters)**

- GS measuring instruments
  - . radiation measuring instruments
  - . . radiation detectors
  - . . . dosimeters
  - . . . . **threshold detectors (dosimeters)**
- RT ionization chambers
  - ∞ thresholds

**threshold gates**

- GS circuits
  - . gates (circuits)
  - . . **threshold gates**
  - . logic circuits
  - . . **threshold gates**
- RT ∞ thresholds
  - trigger circuits

**threshold logic**

- GS mathematical logic
  - . set theory
  - . . **threshold logic**
- RT gates (circuits)
  - ∞ logic
  - logic circuits
  - ∞ thresholds
  - transistor logic
  - trigger circuits

*threshold shift*USE **thresholds****threshold voltage**

DEF The threshold energy necessary to remove an electron from the bound position to the conduction band in solid state devices.

- GS potential energy
  - . electric potential
  - . . **threshold voltage**
- RT photovoltages
  - photovoltaic effect
  - semiconductor junctions
  - silicon junctions
  - solid state devices
  - threshold currents
  - ∞ thresholds
  - volt-ampere characteristics

∞ **thresholds**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)

DEF Generally, the minimum values of signals that can be detected by the systems or sensors under consideration. Used for threshold shift.

- UF *threshold shift*
- RT doors
  - entrances
  - noise threshold
  - resolution

responses

- sensitivity
- threshold currents
- threshold detectors (dosimeters)
- threshold gates
- threshold logic
- threshold voltage
- thresholds (perception)

**thresholds (perception)**

- UF *sensory thresholds*
- RT acuity
  - adaptation
  - audiometry
  - auditory perception
  - auditory sensation areas
  - auditory stimuli
  - chronaxy
  - frequency response
  - hearing
  - light adaptation
  - limen
  - neurology
  - perception
  - photosensitivity
  - sensitivity
  - ∞ thresholds
  - vision
  - visual perception

**throats**

- SN (NON BIOLOGICAL)
- DEF The narrowest portion of a constricted duct, as in a diffuser, or a venturi tube. SN (non biological).
- RT carburetors
  - ∞ channels
  - chokes (restrictions)
  - ducts
  - nozzle geometry
  - nozzle inserts
  - nozzle walls
  - orifices

**thrombin**

- GS biopolymers
  - . proteins
  - . . enzymes
  - . . . **thrombin**
  - body fluids
  - . blood
  - . . **thrombin**
  - organic compounds
  - . proteins
  - . . enzymes
  - . . . **thrombin**
- RT blood coagulation
  - fibrin
  - fibrinogen
  - hemostatics
  - prothrombin
  - thromboplastin

**thrombocytes**

- RT blood coagulation
  - clotting

**thrombopenia**

- GS diseases
  - . **thrombopenia**
- RT coagulation

**thromboplastin**

- GS body fluids
  - . blood
  - . . **thromboplastin**
- RT blood coagulation
  - clotting
  - hemostatics
  - homeostasis
  - platelets
  - thrombin

**thrombosis**

- GS diseases
  - . **thrombosis**
- RT blood coagulation
  - infarction

myocardial infarction

**throttling**

- RT Joule-Thomson effect
  - variable thrust

**throwing**

- RT ejection
  - spreading

**thrust**DEF The pushing or pulling force developed by an aircraft engine or a rocket engine. The force exerted in any direction by a fluid jet or by a powered screw, as, the thrust of an antitorque rotor. Specifically in rocketry,  $F(\text{thrust}) = mv$  where  $m$  is propellant mass flow and  $v$  is exhaust velocity relative to the vehicle. Used for thrust power.UF *thrust power*

- GS **thrust**
  - . high thrust
  - . jet thrust
  - . leading edge thrust
  - . low thrust
  - . . microthrust
  - . rocket thrust
  - . . retrothrust
  - . static thrust
  - . variable thrust
- RT acceleration (physics)
  - auxiliary propulsion
  - burning time
  - dual thrust nozzles
  - ∞ force
    - jet engines
    - nozzle thrust coefficients
  - ∞ power
    - propulsion
  - ∞ reaction
    - rocket engines
    - rocket propellants
    - specific impulse
    - total impulse

**thrust augmentation**

DEF The increasing of the thrust of an engine or power plant, especially of a jet engine and usually for a short period of time, over the thrust normally developed.

- GS augmentation
  - . **thrust augmentation**
- RT afterburning
  - Coanda effect
  - high thrust
  - secondary injection
  - shrouded propellers
  - variable thrust
  - water injection

**thrust bearings**

- GS bearings
  - . **thrust bearings**
- RT antifriction bearings
  - ball bearings
  - gas bearings
  - roller bearings

**thrust chamber pressure**

- GS pressure
  - . **thrust chamber pressure**

**thrust chambers**

- UF *rocket chambers*
- RT arc chambers
  - ∞ chambers
    - combustion chambers
    - divergent nozzles
    - rocket engine cases

**thrust control**

- GS **thrust control**
  - . thrust vector control
- RT attitude control
  - ∞ control
    - control rockets
    - engine control
    - jet control
  - ∞ reaction control
    - rocket engine control



## thrust distribution

satellite control  
turbojet engine control  
variable thrust

### thrust distribution

DEF The location of areas of upward thrust (lift) on wings, airfoils, etc.

RT aerodynamic forces  
∞ distribution  
force distribution  
leading edges  
pressure distribution  
vortices  
wing planforms

### thrust faults

USE **geological faults**

### thrust loads

GS loads (forces)  
. dynamic loads  
. . **thrust loads**  
RT aerodynamic loads  
axial compression loads  
axial loads  
compression loads  
jet thrust  
rocket thrust  
structural design criteria

### thrust measurement

GS mechanical measurement  
. **thrust measurement**  
RT accelerometers  
dynamometers  
∞ force  
∞ measurement

### thrust power

USE **thrust**

### thrust programming

UF *optimum thrust programming*  
GS scheduling  
. programming (scheduling)  
. . **thrust programming**  
RT flight mechanics  
flight optimization  
flight plans  
orbital mechanics  
parking orbits  
propulsive efficiency  
trajectory control

### thrust reversal

RT aircraft brakes  
brakes (for arresting motion)  
braking  
deceleration

### thrust termination

GS stopping  
. **thrust termination**  
RT burnout  
rocket thrust  
stage separation  
variable thrust

### thrust vector control

UF *TVC (control)*  
GS attitude control  
. directional control  
. . **thrust vector control**  
flight control  
. **thrust vector control**  
thrust control  
. **thrust vector control**  
RT air slew missiles  
automatic control  
automatic flight control  
∞ control  
guide vanes  
gyrostabilizers  
jet vanes  
liquid injection  
maneuverable spacecraft  
missile control  
nozzle thrust coefficients  
rocket engines  
secondary injection

spacecraft control  
variable thrust  
Vernier engines  
X-31 aircraft

### ∞ thrusters

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ion engines  
magnetoplasmadynamic thrusters  
pulsed inductive thrusters  
pulsed plasma thrusters  
rocket engines

### thrust-weight ratio

GS ratios  
. **thrust-weight ratio**  
RT acceleration (physics)  
mass ratios  
pressure ratio  
rocket engines

### thulium

GS chemical elements  
. rare earth elements  
. . **thulium**  
. . . thulium isotopes  
metals  
. rare earth elements  
. . **thulium**  
. . . thulium isotopes

### thulium 171

USE **thulium isotopes**

### thulium compounds

GS rare earth compounds  
. **thulium compounds**  
RT ∞ chemical compounds  
∞ metal compounds

### thulium isotopes

UF *thulium 171*  
GS chemical elements  
. nuclides  
. . isotopes  
. . . **thulium isotopes**  
. rare earth elements  
. . thulium  
. . . **thulium isotopes**  
metals  
. rare earth elements  
. . thulium  
. . . **thulium isotopes**

### Thunderchief aircraft

USE **F-105 aircraft**

### thunderstorms

DEF Local storms resulting from warm humid air rising in an unstable environment.

GS storms  
. storms (meteorology)  
. . rainstorms  
. . . **thunderstorms**  
RT anvil clouds  
arc clouds  
atmospherics  
cirrocumulus clouds  
cirrostratus clouds  
clouds (meteorology)  
cold fronts  
cumulonimbus clouds  
downbursts  
elves  
fronts (meteorology)  
hail  
hailstorms  
lightning  
lightning suppression  
microbursts (meteorology)  
rain  
sprites (atmospheric physics)  
storm damage  
warm fronts  
wind (meteorology)

### thymidine

GS acids  
. **thymidine**

bases (chemical)  
. **thymidine**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . pyrimidines  
. . . . **thymidine**  
RT alloxan  
deoxyribonucleic acid  
nucleosides

### thymine

GS acids  
. **thymine**  
nitrogen compounds  
. **thymine**  
organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . pyrimidines  
. . . . **thymine**  
RT alloxan  
deoxyribonucleic acid

### thymol

GS hydroxyl compounds  
. alcohols  
. . phenols  
. . . **thymol**

### thymus gland

GS anatomy  
. glands (anatomy)  
. . endocrine glands  
. . . **thymus gland**  
. immune systems  
. . lymphatic system  
. . . **thymus gland**

### thyatron

GS electron tubes  
. gas discharge tubes  
. . **thyatron**  
microwave equipment  
. **thyatron**  
rectifiers  
. **thyatron**  
RT current converters (AC to DC)  
silicon controlled rectifiers  
thyristors

### thyristors

GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . **thyristors**  
. . . . silicon controlled rectifiers  
rectifiers  
. **thyristors**  
. . silicon controlled rectifiers  
RT junction transistors  
p-n-p-n junctions  
thyatron  
trigger circuits  
triodes

### thyroid gland

GS anatomy  
. glands (anatomy)  
. . endocrine glands  
. . . **thyroid gland**  
RT calcium metabolism  
hypometabolism  
thyroxine

### thyroxine

GS acids  
. amino acids  
. . **thyroxine**  
organic compounds  
. amino acids  
. . **thyroxine**  
secretions  
. endocrine secretions  
. . hormones  
. . . **thyroxine**  
RT thyroid gland

### Tibet

GS nations

RT . **Tibet**  
Asia  
Bhutan  
Himalayas

**tibia**  
GS anatomy  
. musculoskeletal system  
. . bones  
. . . **tibia**  
RT leg (anatomy)

**TID**  
USE **traveling ionospheric disturbances**

**tidal flats**  
GS landforms  
. flats (landforms)  
. . **tidal flats**  
RT aquaculture  
coasts  
estuaries  
fisheries  
marshlands  
mud  
oceans  
shorelines  
tides

*tidal oscillation*  
USE **tides**

**tidal waves**  
GS water waves  
. **tidal waves**  
RT ocean currents  
ocean surface  
oceanography  
sea breeze  
sea roughness  
seismology  
tsunami waves  
∞ waves  
wind (meteorology)

**tide powered generators**  
RT electric generators  
energy conversion efficiency  
∞ generators  
ocean currents  
ocean surface  
oceanography  
oceans  
sea roughness  
tidepower  
tides  
waterwave energy conversion  
waterwave powered machines

**tide powered machines**  
RT ∞ machinery  
ocean currents  
ocean surface  
sea roughness  
tidepower  
tides  
waterwave energy conversion  
waterwave powered machines

**tidepower**  
GS renewable energy  
. **tidepower**  
RT clean energy  
Earth resources  
∞ energy sources  
ocean currents  
ocean surface  
oceanography  
sea roughness  
tide powered generators  
tide powered machines  
tides  
waterwave energy  
waterwave energy conversion  
waterwave powered machines

**tides**  
DEF The periodic rising and falling of the Earth's oceans and atmosphere. It results from the gravitational forces of the moon and sun

acting upon the rotating Earth. The disturbance actually propagates as a wave through the atmosphere and along the surface of the waters of the Earth. Atmospheric tides are always so designated, whereas the term tide alone commonly implies the oceanic variety. Used for tidal oscillation.

UF *tidal oscillation*  
GS **tides**  
. atmospheric tides  
. Earth tides  
. lunar tides  
RT coastal currents  
estuaries  
flood damage  
floods  
ocean currents  
ocean surface  
oceanography  
pressure ice  
sea roughness  
tidal flats  
tide powered generators  
tide powered machines  
tidepower  
water currents  
waterwave energy conversion  
waterwave powered machines  
wetlands

**tiebolts**  
GS fasteners  
. bolts  
. . **tiebolts**

*TIG welding*  
USE **gas tungsten arc welding**

**tightness**  
RT clearances  
closures  
proximity

**tiles**  
DEF Ceramic surfacing units, usually relatively thin in relation to facial area, made from clay or a mixture of clay and other ceramic materials, called the body of the tile having either a "glazed" or "unglazed" face and fired above red heat in the course of manufacture to a temperature sufficiently high to produce specific physical properties and characteristics.  
RT ceramics  
floors  
grout  
Ludox (trademark)  
masonry  
walls

*tilt*  
USE **attitude (inclination)**

**tilt rotor aircraft**  
DEF A type of convertible aircraft which takes off, hovers, and lands as a helicopter but is converted into a fixed wing aircraft by the 90-degree tilting of its rotor or rotors for use as a propeller for forward flight.  
GS V/STOL aircraft  
. rotary wing aircraft  
. . **tilt rotor aircraft**  
. . . V-22 aircraft  
. . . XV-15 aircraft  
RT ∞ aircraft  
helicopters  
rotor stator interactions  
tilting rotors

**Tilt Rotor Research Aircraft Program**  
GS programs  
. NASA programs  
. . **Tilt Rotor Research Aircraft Program**

RT ∞ aircraft  
helicopters  
rotary wings  
V-22 aircraft

XV-15 aircraft

**tilt wing aircraft**  
UF *pivoted wing aircraft*  
GS **tilt wing aircraft**  
. CL-84 aircraft  
. L-29 jet trainer  
. VZ-2 aircraft  
. XC-142 aircraft  
RT ∞ aircraft  
fan in wing aircraft  
research aircraft  
short takeoff aircraft  
V-22 aircraft  
V/STOL aircraft  
vertical takeoff aircraft  
X-22 aircraft

**tilted propellers**  
GS propellers  
. **tilted propellers**  
RT helicopter propeller drive

*tilting*  
USE **attitude (inclination)**

**tilting rotors**  
GS airfoils  
. wings  
. . rotary wings  
. . . **tilting rotors**  
rotating bodies  
. rotors  
. . rotary wings  
. . . **tilting rotors**  
RT tilt rotor aircraft  
V-22 aircraft  
XV-3 aircraft

**tiltmeters**  
DEF Instruments used to measure small changes in the tilt of the Earth's surface usually in relation to a liquid-level surface or to the rest position of a pendulum.  
GS measuring instruments  
. **tiltmeters**  
RT attitude (inclination)  
geophysics  
seismographs

**tilt-table test**  
(added August 2004)  
DEF A test to evaluate homodynamic or cardiovascular response that uses a tilt-adjustable table to maintain a head-down or head-up body posture.  
GS physiological tests  
. **tilt-table test**  
RT aerospace medicine  
bioastronautics  
cardiovascular system  
gravitational physiology  
head down tilt  
head up tilt  
hemodynamic responses  
hindlimb suspension  
lower body negative pressure  
orthostatic tolerance  
physiological responses  
supine position  
weightlessness simulation

**timber identification**  
GS identifying  
. **timber identification**  
recognition  
. **timber identification**  
RT conifers  
crop identification  
deciduous trees  
Earth resources  
evaluation  
forests  
trees (plants)

**timber inventory**  
GS inventories  
. **timber inventory**  
RT aerial photography  
Earth resources

## timber vigor

forest management  
forests  
infrared photography  
photography  
reforestation  
satellite-borne photography  
trees (plants)

### timber vigor

RT foliage  
forests  
growth  
timberline  
trees (plants)

### timberline

RT dendrochronology  
forests  
growth  
high altitude environments  
polar regions  
timber vigor  
trees (plants)

### time

DEF The hour of the day reckoned by the position of a celestial reference point relative to a reference celestial median. Used for duration.

UF *duration*

GS **time**

. access time  
. burning time  
. downtime  
. ephemeris time  
. flight time  
. MTBF  
. reaction time  
. . chronaxy  
. relaxation time  
. response time (computers)  
. sidereal time  
. testing time  
. transit time  
. universal time

RT

calendars  
celestial geodesy  
chronology  
exposure  
intervals  
launch dates  
month  
prolongation  
relativistic effects  
schedules  
synchronism  
time measurement  
units of measurement

### time constant

DEF Generally, the time required for an instrument to indicate a given percentage of the final reading resulting from an input signal; the relaxation time of an instrument.

GS constants

. **time constant**  
. . perceptual time constant

RT

access time  
 $\infty$  constant  
damping  
dynamic characteristics  
dynamic response  
impedance  
LC circuits  
RC circuits  
reaction time  
relaxation time  
RL circuits  
RLC circuits  
 $\infty$  time response  
transfer functions  
transient response

*time delay*

USE **time lag**

### time dependence

GS dependence  
. **time dependence**  
RT  $\infty$  Helmholtz equations  
spatial dependencies

stochastic processes  
temporal distribution  
 $\infty$  time response

### time discrimination

RT comparator circuits  
sensory discrimination

### time division multiple access

DEF Radio transmission method in which each station of a satellite communication network is assigned a time schedule for transmission (in lieu of frequency division); a multi-element antenna with an adaptive null steering array eliminates interference. Used for TDMA.

UF *TDMA*

GS telecommunication  
. multiple access  
. . **time division multiple access**  
. . radio communication  
. . . radio relay systems  
. . . . **time division multiple access**  
transmission  
. signal transmission  
. . data transmission  
. . . multiple access  
. . . . **time division multiple access**  
RT Aloha system  
channel noise  
frequency division multiple access  
multichannel communication  
packet switching  
pulse communication  
satellite networks  
switching  
wideband communication

### time division multiplexing

DEF A system for the transmission of information about two or more quantities (measurands) over a common channel by dividing available time intervals among the measurands to form a composite pulse train.

GS transmission

. multiplexing  
. . **time division multiplexing**  
RT demultiplexing  
frequency division multiplexing  
pulse modulation  
telemetry  
television transmission  
wavelength division multiplexing

### time domain analysis

(added April 1999)

GS analysis (mathematics)  
. **time domain analysis**  
. . finite difference time domain  
method

RT control systems design  
dynamic response  
parameter identification  
signal processing  
 $\infty$  time response

### time functions

GS functions (mathematics)  
. **time functions**  
RT rates (per time)  
square waves  
stochastic processes  
wave functions  
waveforms  
wavelet analysis

### time lag

DEF The total time between the application of a signal to a measuring instrument and the full indication of that signal within the uncertainty of the instrument. Used for chronotrons, lag (delay), and time delay.

UF *chronotrons*

*lag (delay)*

*time delay*

RT cepstral analysis  
delay  
delay lines  
electric relays  
hysteresis  
inventory controls

reaction time  
refractory period  
responses  
schedules  
 $\infty$  time response  
transmission rate (communications)

*time lapse photography*

USE **chronophotography**

### time marching

DEF Techniques for solving a problem with partial differential equations that have a time derivation.

RT finite difference theory  
numerical analysis  
spatial marching

### time measurement

UF *dating*  
*epochs*  
*timing*  
GS **time measurement**  
. clock paradox  
RT atomic clocks  
chronometers  
clocks  
consecutive events  
frequency measurement  
 $\infty$  measurement  
oscillographs  
radioactive age determination  
rates (per time)  
sidereal time  
stroboscopes  
synchronism  
time  
 $\infty$  time response  
time synchronization  
timing devices  
velocity  
velocity measurement  
windows (intervals)

### time measuring instruments

GS measuring instruments  
. **time measuring instruments**  
. . clocks  
. . . atomic clocks  
. . . . autonomous spacecraft clocks  
. . . chronometers  
. . timing devices

### time of flight spectrometers

GS measuring instruments  
. spectrometers  
. . **time of flight spectrometers**  
RT spectroscopy

### time optimal control

GS automatic control  
. optimal control  
. . **time optimal control**  
optimization  
. optimal control  
. . **time optimal control**  
RT  $\infty$  control

### $\infty$ time response

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT access time  
delay  
response bias  
responses  
temporal distribution  
time constant  
time dependence  
time domain analysis  
time lag  
time measurement

### time series analysis

RT  $\infty$  applications of mathematics  
autocorrelation  
autoregressive moving average  
correlation  
curve fitting  
data sampling  
extrapolation

forecasting  
 Fourier analysis  
 Kalman-Schmidt filtering  
 maximum entropy method  
 scheduling  
 ∞ statistics  
 stochastic processes  
 trend analysis  
 trends

**time sharing**  
 DEF A mode of operation that permits two or more users to execute computer programs concurrently on the same computer system by interleaving the execution of the program. Time sharing may be implemented by time slicing, priority-based interrupts, or other scheduling methods.  
 RT computer programming  
 coordination  
 multiple output programs  
 multiprocessing (computers)  
 multiprogramming  
 pipelining (computers)  
 run time (computers)

**time signals**  
 DEF Accurate signals marking specified times or time intervals. They are used primarily for determining errors of timepieces. Such signals are usually sent from an observatory by radio or telegraph.  
 RT clock paradox  
 frequency standards  
 picosecond pulses  
 pulse duration  
 ∞ signals  
 time synchronization  
 timing devices

**time synchronization**  
 (added December 1998)  
 GS synchronism  
 . **time synchronization**  
 RT clocks  
 frequency standards  
 frequency synchronization  
 Global Positioning System  
 time measurement  
 time signals  
 universal time

**time temperature parameter**  
 RT aging (metallurgy)  
 austenitic stainless steels  
 embrittlement  
 fracture mechanics  
 long term effects  
 metallography  
 precipitation hardening  
 temperature effects

*timers*  
 USE **timing devices**

*timing*  
 USE **time measurement**

**timing devices**  
 UF *timers*  
 GS measuring instruments  
 . time measuring instruments  
 . . **timing devices**  
 RT chronometers  
 clock paradox  
 clocks  
 dwell  
 pendulums  
 tachometers  
 time measurement  
 time signals

**Timoshenko beams**  
 DEF Simple structural units used by Stephen Timoshenko as models in developing analysis equations for deflections and deformations of beams and columns under load.  
 GS structural members  
 . beams (supports)  
 . . **Timoshenko beams**

RT columns (supports)  
 Euler-Bernoulli beams  
 trusses

**tin**  
 GS chemical elements  
 . **tin**  
 . . tin isotopes  
 metals  
 . **tin**  
 . . tin isotopes

**tin alloys**  
 GS alloys  
 . **tin alloys**  
 . . babbitt metal  
 RT bearing alloys  
 bismuth alloys  
 indium alloys  
 solders  
 stannides  
 Zircalloys (trademark)

**tin compounds**  
 GS **tin compounds**  
 . organic tin compounds  
 . stannates  
 . stannides  
 . . niobium stannides  
 . tin oxides  
 . tin tellurides  
 RT ∞ chemical compounds  
 ∞ Group 4A compounds  
 ∞ metal compounds

**tin isotopes**  
 GS chemical elements  
 . nuclides  
 . . isotopes  
 . . . **tin isotopes**  
 . tin  
 . . **tin isotopes**  
 metals  
 . tin  
 . . **tin isotopes**

**tin oxides**  
 GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . **tin oxides**  
 tin compounds  
 . **tin oxides**  
 RT SIS (semiconductors)

**tin tellurides**  
 GS chalcogenides  
 . tellurides  
 . . **tin tellurides**  
 tellurium compounds  
 . tellurides  
 . . **tin tellurides**  
 tin compounds  
 . **tin tellurides**

**tip driven rotors**  
 UF *hot cycle propulsion system*  
 GS airfoils  
 . wings  
 . . rotary wings  
 . . . **tip driven rotors**  
 rotating bodies  
 . rotors  
 . . rotary wings  
 . . . **tip driven rotors**  
 RT XV-9A aircraft

**tip speed**  
 GS rates (per time)  
 . **tip speed**  
 velocity  
 . **tip speed**  
 RT angular velocity  
 critical velocity  
 rotor speed

**tip vanes**  
 DEF Wing mounted rotor tips with their spans oriented approximately parallel to the local free stream to increase the capture area

and power output of the rotor.  
 GS rotating bodies  
 . rotors  
 . . **tip vanes**  
 turbomachinery  
 . turbines  
 . . wind turbines  
 . . . **tip vanes**

**tips**  
 GS **tips**  
 . blade tips  
 . crack tips  
 . nose tips  
 . wing tips  
 RT airfoil profiles  
 edges

**tires**  
 GS **tires**  
 . aircraft tires  
 RT blowouts  
 inflatable structures  
 landing gear  
 rollers  
 toroidal wheels  
 treads  
 vehicle wheels  
 wheel brakes  
 wheels

**TIROS 1 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 1 satellite**  
 RT Thor Able rocket vehicle

**TIROS 2 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 2 satellite**  
 RT Delta launch vehicle

**TIROS 3 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 3 satellite**  
 RT Delta launch vehicle

**TIROS 4 satellite**  
 UF *TIROS D satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 4 satellite**  
 RT Delta launch vehicle

**TIROS 5 satellite**  
 UF *TIROS E satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 5 satellite**  
 RT Delta launch vehicle

**TIROS 6 satellite**  
 UF *TIROS F satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 6 satellite**  
 RT Delta launch vehicle

**TIROS 7 satellite**  
 UF *TIROS G satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 7 satellite**  
 RT Delta launch vehicle

**TIROS 8 satellite**  
 UF *TIROS H satellite*  
 GS artificial satellites  
 . meteorological satellites  
 . . TIROS satellites  
 . . . **TIROS 8 satellite**

## TIROS 9 satellite

RT Delta launch vehicle

### TIROS 9 satellite

UF *TIROS wheel satellite*

GS artificial satellites  
. meteorological satellites  
. . . TIROS satellites  
. . . **TIROS 9 satellite**

RT Delta launch vehicle

### TIROS 10 satellite

GS artificial satellites  
. meteorological satellites  
. . . TIROS satellites  
. . . **TIROS 10 satellite**

RT Delta launch vehicle

### TIROS D satellite

USE **TIROS 4 satellite**

### TIROS E satellite

USE **TIROS 5 satellite**

### TIROS F satellite

USE **TIROS 6 satellite**

### TIROS G satellite

USE **TIROS 7 satellite**

### TIROS H satellite

USE **TIROS 8 satellite**

### TIROS M

GS artificial satellites  
. meteorological satellites  
. . . TIROS satellites  
. . . **TIROS M**

RT ITOS 1  
ITOS 2  
ITOS 3  
ITOS 4  
ITOS satellites

### TIROS N series satellites

DEF A new term for the family of satellites designed to prototype Tiros N.

GS artificial satellites  
. meteorological satellites  
. . . TIROS satellites  
. . . NOAA 6 satellite

RT Advanced Microwave Sounding Unit  
Advanced Very High Resolution Radiometer

ITOS 1  
ITOS 2  
ITOS 3  
ITOS 4  
ITOS satellites  
NOAA 7 satellite  
TIROS operational satellite system

### TIROS operational satellite system

RT cloud photography  
ITOS 1  
ITOS 2  
ITOS 3  
ITOS 4  
satellite observation

∞ systems  
TIROS N series satellites

### TIROS project

GS programs  
. NASA programs  
. . . NASA space programs  
. . . **TIROS project**  
. projects  
. . . **TIROS project**  
. space programs  
. . . NASA space programs  
. . . **TIROS project**

RT cloud photographs  
cloud photography  
meteorological satellites

### TIROS satellites

DEF A series of NASA and NOAA satellites launched to monitor the Earth's weather. Those funded by NASA are called TIROS, and those funded by NOAA are called ESSA.

GS artificial satellites  
. meteorological satellites

. . . **TIROS satellites**  
. . . ITOS satellites  
. . . . ITOS 1  
. . . . ITOS 2  
. . . . ITOS 3  
. . . . ITOS 4  
. . . TIROS 1 satellite  
. . . TIROS 2 satellite  
. . . TIROS 3 satellite  
. . . TIROS 4 satellite  
. . . TIROS 5 satellite  
. . . TIROS 6 satellite  
. . . TIROS 7 satellite  
. . . TIROS 8 satellite  
. . . TIROS 9 satellite  
. . . TIROS 10 satellite  
. . . TIROS M  
. . . TIROS N series satellites  
. . . NOAA 6 satellite

RT cloud photography  
ESSA satellites  
polar orbits  
satellite observation

### TIROS wheel satellite

USE **TIROS 9 satellite**

### tissue culturing

(added August 2004)

DEF Maintaining or growing of tissue, organ primordia, or the whole or part of an organ in vitro so as to preserve its architecture and/or function. Tissue culturing includes both organ culturing and cell culturing.

GS culture techniques  
. **tissue culturing**

RT cell culturing  
clone cells  
culture media  
cultured cells  
microbiology  
organ culturing  
tissue engineering

### tissue engineering

(added October 2000)

DEF Discipline for the in vitro growth and maintenance of tissue, organ primordia, or the whole or part of an organ so as to preserve its architecture and/or function. In terms of application, the primary goal of this technology is the replacement of deficient organs.

GS bioengineering  
. **tissue engineering**  
technologies  
. biotechnology  
. . . **tissue engineering**

RT bioreactors  
cell culturing  
cells (biology)  
clinostats  
culture media  
culture techniques  
cytology  
growth  
histology  
in vitro methods and tests

∞ microgravity applications  
organ culturing  
organs  
tissue culturing  
tissues (biology)

### tissues (biology)

GS **tissues (biology)**  
. connective tissue  
. endothelium  
. epicardium  
. epithelium  
. hypodermis  
. neuroglia  
. plantar tissues  
. scars  
. . . adipose tissues  
. . . bone marrow  
. . . cartilage

RT anatomy  
atrophy

∞ biology  
cancer

∞ cells  
cells (biology)  
cultivation  
cystic fibrosis  
cysts  
fibroblasts  
fibrosis  
histochemical analysis  
histology  
infarction  
macrophages  
mediastinum  
necrosis  
organs  
osteogenesis  
peritoneum  
tissue engineering

### Titan

DEF A satellite of Saturn orbiting at a mean distance of 1,222,000 kilometers.

GS celestial bodies  
. natural satellites  
. . . Saturn satellites  
. . . **Titan**

RT atmospheric composition  
Cassini mission  
Charon  
Huygens probe  
satellite atmospheres  
Saturn (planet)  
Titan atmosphere  
Triton

### Titan 1 ICBM

UF *SM-68 missile*

GS missiles  
. ballistic missiles  
. . . intercontinental ballistic missiles  
. . . Titan ICBM  
. . . . **Titan 1 ICBM**  
. surface to surface missiles  
. . . intercontinental ballistic missiles  
. . . Titan ICBM  
. . . . **Titan 1 ICBM**

RT LR-87-AJ-5 engine

### Titan 2 ICBM

UF *SM-68B missile*

GS missiles  
. ballistic missiles  
. . . intercontinental ballistic missiles  
. . . Titan ICBM  
. . . . **Titan 2 ICBM**  
. surface to surface missiles  
. . . intercontinental ballistic missiles  
. . . Titan ICBM  
. . . . **Titan 2 ICBM**

RT Hyla-Star rocket vehicle

### Titan 3 launch vehicle

GS launch vehicles  
. Titan launch vehicles  
. . . **Titan 3 launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . . Titan launch vehicles  
. . . . **Titan 3 launch vehicle**

RT manned orbital laboratories

### Titan 4 launch vehicle

(added February 1993)

GS launch vehicles  
. Titan launch vehicles  
. . . **Titan 4 launch vehicle**  
. . . Titan 4B launch vehicle  
rocket vehicles  
. multistage rocket vehicles  
. . . Titan launch vehicles  
. . . . **Titan 4 launch vehicle**  
. . . . Titan 4B launch vehicle

RT Titan Centaur launch vehicle

∞ vehicles

### Titan 4B launch vehicle

(added October 1998)

GS launch vehicles  
. Titan launch vehicles

.. Titan 4 launch vehicle  
 ... **Titan 4B launch vehicle**  
 rocket vehicles  
 . multistage rocket vehicles  
 .. Titan launch vehicles  
 ... Titan 4 launch vehicle  
 ... **Titan 4B launch vehicle**  
 RT Cassini mission  
 laser gyroscopes

#### Titan atmosphere

(added May 2005)  
 DEF The atmosphere surrounding the Saturnian satellite Titan.  
 GS environments  
 . extraterrestrial environments  
 .. satellite atmospheres  
 ... **Titan atmosphere**  
 RT Cassini mission  
 Huygens probe  
 Saturn (planet)  
 Titan

#### Titan Centaur launch vehicle

DEF A Titan III rocket augmented with a Centaur rocket for launching spacecraft requiring high-velocity escape trajectories.  
 GS launch vehicles  
 . **Titan Centaur launch vehicle**  
 rocket vehicles  
 . **Titan Centaur launch vehicle**  
 RT Centaur launch vehicle  
 Titan 4 launch vehicle

#### Titan ICBM

GS missiles  
 . ballistic missiles  
 .. intercontinental ballistic missiles  
 ... **Titan ICBM**  
 .... Titan 1 ICBM  
 .... Titan 2 ICBM  
 . surface to surface missiles  
 .. intercontinental ballistic missiles  
 ... **Titan ICBM**  
 .... Titan 1 ICBM  
 .... Titan 2 ICBM  
 RT liquid propellant rocket engines  
 LR-91-AJ-5 engine  
 multistage rocket vehicles  
 YLR-91-AJ-1 engine

#### Titan launch vehicles

GS launch vehicles  
 . **Titan launch vehicles**  
 .. Titan 3 launch vehicle  
 .. Titan 4 launch vehicle  
 ... Titan 4B launch vehicle  
 rocket vehicles  
 . multistage rocket vehicles  
 .. **Titan launch vehicles**  
 ... Titan 3 launch vehicle  
 ... Titan 4 launch vehicle  
 ... Titan 4B launch vehicle  
 RT Gemini 3 flight  
 Gemini 7 flight  
 Gemini 8 flight  
 Gemini 9 flight  
 Gemini 10 flight  
 Gemini 11 flight  
 Gemini 12 flight  
 liquid propellant rocket engines  
 solid propellant rocket engines  
 ∞ vehicles

#### Titan project

GS programs  
 . NASA programs  
 .. NASA space programs  
 ... **Titan project**  
 . projects  
 .. **Titan project**  
 . space programs  
 .. NASA space programs  
 ... **Titan project**  
 RT ∞ boosters  
 Gemini project  
 Gemini spacecraft  
 launch vehicles  
 launchers

launching

#### titanates

GS titanium compounds  
 . **titanates**  
 .. barium titanates  
 .. ilmenite  
 .. lead titanates  
 ... lead zirconate titanates  
 .. magnesium titanates  
 .. perovskites  
 .. strontium titanates  
 .. zirconium titanates  
 ... lead zirconate titanates  
 RT euxenite

#### Titania

DEF A satellite of Uranus orbiting at a mean distance of 438,000 kilometers.  
 GS celestial bodies  
 . natural satellites  
 .. icy satellites  
 ... **Titania**  
 .. Uranus satellites  
 ... **Titania**  
 RT Uranus (planet)

#### titanium

GS chemical elements  
 . **titanium**  
 .. titanium isotopes  
 metals  
 . transition metals  
 .. **titanium**  
 ... titanium isotopes

#### titanium alloys

GS alloys  
 . **titanium alloys**  
 .. nitinol alloys  
 RT aluminides  
 shape memory alloys  
 titanium aluminides  
 vanadium alloys

#### titanium aluminides

(added June 1997)  
 GS aluminum compounds  
 . aluminides  
 .. **titanium aluminides**  
 titanium compounds  
 . **titanium aluminides**  
 RT intermetallics  
 titanium alloys

#### titanium borides

GS boron compounds  
 . borides  
 .. **titanium borides**  
 titanium compounds  
 . **titanium borides**

#### titanium carbides

GS carbon compounds  
 . carbides  
 .. **titanium carbides**  
 titanium compounds  
 . **titanium carbides**  
 RT ceramic fibers  
 ceramic matrix composites

#### titanium chlorides

GS halogen compounds  
 . chlorine compounds  
 .. chlorides  
 ... **titanium chlorides**  
 . halides  
 .. chlorides  
 ... **titanium chlorides**  
 .. metal halides  
 ... **titanium chlorides**  
 titanium compounds  
 . **titanium chlorides**

#### titanium compounds

GS **titanium compounds**  
 . titanates  
 .. barium titanates  
 .. ilmenite  
 .. lead titanates

... lead zirconate titanates  
 .. magnesium titanates  
 .. perovskites  
 .. strontium titanates  
 .. zirconium titanates  
 ... lead zirconate titanates  
 . titanium borides  
 . titanium carbides  
 . titanium chlorides  
 . titanium nitrides  
 . titanium oxides  
 .. anatase  
 .. ilmenite  
 .. rutile  
 . titanium aluminides  
 RT ∞ chemical compounds  
 ∞ Group 4B compounds  
 ∞ metal compounds

#### titanium dioxide

USE **titanium oxides**

#### titanium isotopes

GS chemical elements  
 . nuclides  
 .. isotopes  
 ... **titanium isotopes**  
 . titanium  
 .. **titanium isotopes**  
 metals  
 . transition metals  
 .. titanium  
 ... **titanium isotopes**

#### titanium nitrides

GS nitrogen compounds  
 . nitrides  
 .. metal nitrides  
 ... **titanium nitrides**  
 titanium compounds  
 . **titanium nitrides**  
 RT ceramic matrix composites

#### titanium oxides

UF *titanium dioxide*  
 GS chalcogenides  
 . oxides  
 .. metal oxides  
 ... **titanium oxides**  
 .... anatase  
 .... ilmenite  
 .... rutile  
 titanium compounds  
 . **titanium oxides**  
 .. anatase  
 .. ilmenite  
 .. rutile  
 RT dioxides

#### titration

DEF The determination of the reactive capacity, usually of a solution, especially, the analytical process of successively adding measured amounts of a reagent (as a standard solution) to a known volume or weight of a sample or sample solution until a desired end point is reached.  
 GS chemical reactions  
 . **titration**  
 RT acidity  
 coulometers  
 iodimetry  
 ion concentration  
 Kjeldahl method  
 solutions

#### titrimeters

GS measuring instruments  
 . **titrimeters**  
 RT chemical analysis

#### TNO (astronomy)

(added June 2006)  
 USE **trans-Neptunian objects**

#### TNT (trinitrotoluene)

USE **trinitrotoluene**

#### tobacco

GS plants (botany)  
 . **tobacco**

## tocopherol

RT nicotine

### tocopherol

UF *vitamin E*

GS organic compounds  
. cyclic compounds  
. . heterocyclic compounds  
. . . **tocopherol**  
. lipids  
. . **tocopherol**  
vitamins  
. **tocopherol**

### Togo

GS nations  
. **Togo**  
RT Africa

### toilets

RT human wastes  
sanitation  
spacecrews  
waste disposal

### tokamak devices

DEF Experimental toroidal magnetic confinement devices where toroidal current runs through the plasma in order to produce fusion reactor like plasma conditions. The name is a Russian acronym for toroidal magnetic current.

GS nuclear reactors  
. **tokamak devices**  
. . Joint European Torus  
plasma generators  
. **tokamak devices**  
. . Joint European Torus

RT beam injection  
beta factor  
bumpy toruses  
divertors (fusion reactors)  
∞ electric power  
limiters (fusion reactors)  
nuclear fusion  
plasma compression  
plasma control  
plasma physics  
poloidal flux  
Q values (nuclear physics)  
∞ reactors  
spheromaks

### tolerances (mechanics)

DEF A group of prescribed limits for specific properties of a particular material.

GS **tolerances (mechanics)**

. impact tolerances  
RT acceptability  
accuracy  
allowances  
clearances  
consistency  
dimensional stability  
drift (instrumentation)  
errors  
hysteresis  
inspection  
linearity  
mechanical properties  
nondestructive tests  
precision  
quality control  
radiation tolerance  
range (extremes)  
reliability  
resolution  
sensitivity  
specifications  
stability  
standards

### tolerances (physiology)

GS **tolerances (physiology)**

. acceleration tolerance  
. altitude tolerance  
. cold tolerance  
. heat tolerance  
. human tolerances  
. radiation tolerance

RT acclimatization  
Barany chair

biocontrol systems  
impact resistance  
noise tolerance  
orthostatic tolerance  
physiology  
range (extremes)  
∞ resistance

### Tollmien-Schlichting waves

(added May 1988)

GS elastic waves  
. **Tollmien-Schlichting waves**  
RT Blasius flow  
boundary layer flow  
boundary layer transition  
laminar flow  
turbulent flow

### toluene

GS organic compounds  
. hydrocarbons  
. . **toluene**  
RT solvents  
xylene

### Tomahawk missiles

GS missiles  
. surface to surface missiles  
. . cruise missiles  
. . . **Tomahawk missiles**  
RT weapons

### tomatoes

(added June 1990)

GS farm crops  
. **tomatoes**  
RT agriculture  
botany  
∞ crops  
∞ food  
seeds

### tombolos

USE **bars (landforms)**

### tomography

DEF Technique of making radiographs of plane sections of a body or an object; its purpose is to show detail in a predetermined plane of the body, while blurring the images of structures in other planes. Used for planigraphy.

UF *planigraphy*  
GS imagery  
. radiography  
. . **tomography**  
. . . computer aided tomography

RT computer graphics  
ground penetrating radar  
image enhancement  
optical data processing  
x ray analysis

### TOMS

USE **Total Ozone Mapping Spectrometer**

### tone

USE **pitch**

### tongue

GS anatomy  
. digestive system  
. . **tongue**  
RT mouth  
voice

### Tonk meteorite

GS celestial bodies  
. meteorites  
. . stony meteorites  
. . . carbonaceous meteorites  
. . . . carbonaceous chondrites  
. . . . . **Tonk meteorite**  
. . . chondrites  
. . . carbonaceous chondrites

. . . . . **Tonk meteorite**

### tonometry

USE **intraocular pressure**  
**pressure measurement**

### tonus

USE **muscular tonus**

### tooling

RT ∞ automation  
machining  
mechanization  
setups  
tools

### tools

GS **tools**  
. drill bits  
. drills  
. files (tools)  
. hammers  
. . electromagnetic hammers  
. machine tools  
. . boring machines  
. . grinding machines  
. . lathes  
. . . turret lathes  
. . milling machines  
. . shapers  
. saws  
. shears  
. software development tools  
. space tools  
. wrenches  
RT antiquities  
anvils  
cutters  
fixtures  
∞ hardware  
jigs  
kits  
∞ machinery  
mechanical devices  
mechanization  
platens  
presses  
∞ production  
taps  
tooling  
ultrasonic cleaning

### tooth diseases

UF *aerodontalgia*

GS diseases

. **tooth diseases**

RT cavities  
dental calculi  
dentistry  
oral hygiene  
teeth

### TOPEX

DEF The NASA Ocean Surface Topography Experiment, a proposed mission to utilize satellite altimetry to map the surface topography of the ocean from which the ocean currents are derived.

RT Gulf Stream  
maritime satellites  
ocean currents  
ocean surface  
oceanography  
Poseidon satellite  
satellite observation  
sea states  
topography

### topography

UF *landscape*  
GS **topography**  
. lunar topography  
. terrain  
RT altimetry  
badlands  
barren land  
beaches  
cliffs  
contour sensors  
contours

- cusps (landforms)
- ∞ depression
- desertline
- deserts
- digital elevation models
- dunes
- Earth surface
- elevation
- elevation angle
- escarpments
- geodesy
- geodetic surveys
- geomorphology
- geophysics
- gulfs
- highlands
- hypsography
- isthmuses
- Jupiter red spot
- lagoons
- land
- landforms
- landmarks
- ledges
- mapping
- maria
- Mars surface
- meanders
- muskegs
- oceanography
- peaks (landforms)
- photomapping
- plains
- planetary surfaces
- ∞ profiles
- ravines
- relief maps
- satellite altimetry
- shallow water
- slopes
- stairsteps
- surface roughness
- TOPEX
- valleys
- Venus surface
- wadis
- topology**
- GS geometry
- . **topology**
- . . fixed points (mathematics)
- . . homotopy theory
- . . imbeddings (mathematics)
- . . invariant imbeddings
- . . links (mathematics)
- . . metric space
- . . . Hilbert space
- . . . . Sobolev space
- RT catastrophe theory
- ∞ cells
- continuity
- continuity (mathematics)
- continuums
- deformation
- dimensions
- fault trees
- fibers (mathematics)
- graph theory
- homology
- homotropy
- intervals
- isoperimetric problem
- manifolds (mathematics)
- mapping
- ∞ nets
- network synthesis
- shapes
- switching theory
- toruses
- trees (mathematics)
- Voronoi diagrams
- topping cycle engines**
- RT aircraft engines
- liquid hydrogen
- propulsion system configurations
- wave rotors
- TOPS (spacecraft)**
- UF *Thermoelectric Outer Planet Spacecraft*
- thermoelectric spacecraft*
- GS interplanetary spacecraft
- . **TOPS (spacecraft)**
- RT flyby missions
- interplanetary flight
- outer planets explorers
- space exploration
- space missions
- ∞ spacecraft
- torches**
- GS **torches**
- . plasma torches
- RT cutting
- pyrogen
- welding
- welding machines
- Tornado aircraft*
- USE **MRCA aircraft**
- tornadoes**
- GS storms
- . storms (meteorology)
- . . **tornadoes**
- RT atmospheric circulation
- cold fronts
- cumulonimbus clouds
- cyclones
- fronts (meteorology)
- Fujita method
- ground wind
- hurricanes
- National Severe Storms Project
- rainstorms
- storm damage
- tropical storms
- typhoons
- warm fronts
- wind (meteorology)
- Toro asteroid**
- GS celestial bodies
- . asteroid belts
- . . **Toro asteroid**
- . asteroids
- . . **Toro asteroid**
- RT meteoroids
- solar system
- space debris
- toroidal discharge**
- GS electric current
- . electric discharges
- . . Townsend discharge
- . . . gas discharges
- . . . . **toroidal discharge**
- . . . . . ring discharge
- RT electrodeless discharges
- high frequencies
- plasma jets
- spectrum analysis
- toroidal plasmas**
- UF *plasma rings*
- GS particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . **toroidal plasmas**
- . . . . . corpuscular radiation
- . . . . . energetic particles
- . . . . . plasmas (physics)
- . . . . . **toroidal plasmas**
- RT beam injection
- beta factor
- bumpy toruses
- elliptical plasmas
- limiters (fusion reactors)
- plasma control
- plasma currents
- poloidal flux
- reverse field pinch
- ∞ rings
- rotating plasmas
- solenoids
- spheromaks
- stellarators
- toroidal shells**
- GS shells (structural forms)
- . **toroidal shells**
- RT metal shells
- reinforced shells
- skin (structural member)
- thin walled shells
- toroids
- toroidal wheels**
- DEF Doughnut-shaped wheels designed particularly for vehicles used in soft, granular soil (planetary surfaces). Used for doughnut shape wheels.
- UF *doughnut shape wheels*
- GS wheels
- . **toroidal wheels**
- RT roving vehicles
- suspension systems (vehicles)
- tires
- vehicle wheels
- toroids**
- RT ∞ coils
- ∞ curves
- geometry
- inductors
- ion impact
- magnet coils
- magnetic cores
- toroidal shells
- transformers
- torpedo engines**
- GS engines
- . **torpedo engines**
- . . turborocket engines
- . . ullage rocket engines
- . . Vernier engines
- . . . control rockets
- . . . . SYNCOM apogee engines
- RT internal combustion engines
- rocket propellants
- turbine engines
- underwater propulsion
- torpedoes**
- UF *RETORC (torpedoes)*
- GS explosive devices
- . **torpedoes**
- RT ammunition
- antisubmarine warfare
- ASROC engine
- bombs (ordnance)
- ∞ configurations
- countermeasures
- explosives
- hydroballistics
- missiles
- nuclear weapons
- propellants
- ∞ rockets
- sea launching
- shaped charges
- submerged bodies
- underwater trajectories
- warheads
- weapons
- torque**
- DEF About an axis, the product of a force and the distance of its line of action from the axis. Used for hinge moments.
- UF *hinge moments*
- GS moments
- . **torque**
- RT bending moments
- ∞ force
- loading moments
- moments of inertia
- pitching moments
- rolling moments
- rotation
- shafts (machine elements)
- torque sensors (robotics)
- torquemeters
- torsion
- torsional stress



## torque converters

torsional vibration  
twisting  
yawing moments

### torque converters

DEF Devices for changing the torque speed or mechanical advantage between an input shaft and an output shaft.

RT  $\infty$  converters  
power converters  
transmissions (machine elements)

*torque measuring apparatus*

USE **torquemeters**

### torque motors

GS electromechanical devices  
. electric motors  
. . . **torque motors**  
motors  
. electric motors  
. . . **torque motors**  
RT actuators  
servomotors  
transmissions (machine elements)

*torque sensors (nonrobotics)*

USE **torquemeters**

### torque sensors (robotics)

*(added January 1991)*

GS robot sensors  
. **torque sensors (robotics)**  
RT end effectors  
manipulators  
robots  
 $\infty$  sensors  
servomechanisms  
teleoperators  
torque  
torquemeters

### torquemeters

UF *torque measuring apparatus*  
*torque sensors (nonrobotics)*  
GS measuring instruments  
. **torquemeters**  
RT dynamometers  
mechanical measurement  
torque  
torque sensors (robotics)

### torquers

GS transducers  
. **torquers**  
RT degrees of freedom  
gyroscopes  
sea keeping

### Torres Strait

GS passageways  
. straits  
. . . **Torres Strait**  
RT Australia  
New Guinea (island)

### torsion

RT buckling  
deflection  
deformation  
 $\infty$  force  
moments  
temperature inversions  
torque  
torsional stress  
torsional vibration  
twisting

### torsional stress

GS stresses  
. shear stress  
. . . **torsional stress**  
RT torque  
torsion

### torsional vibration

GS vibration  
. structural vibration  
. . . **torsional vibration**  
RT missile vibration  
random vibration

self induced vibration  
shear strain  
torque  
torsion  
twisting

### torso

GS anatomy  
. **torso**  
RT chest

### toruses

GS geometry  
. Euclidean geometry  
. . . analytic geometry  
. . . . **toruses**  
symmetrical bodies  
. bodies of revolution  
. . . **toruses**  
RT descriptive geometry  
loops  
 $\infty$  rings  
topology

### Tory 2 reactor

GS nuclear electric power generation  
. nuclear power reactors  
. . . **Tory 2 reactor**  
nuclear reactors  
. gas cooled reactors  
. . . **Tory 2 reactor**  
. nuclear power reactors  
. . . **Tory 2 reactor**  
. nuclear research and test reactors  
. . . **Tory 2 reactor**

### Tory 2-A reactor

GS nuclear electric power generation  
. nuclear power reactors  
. . . **Tory 2-A reactor**  
nuclear reactors  
. gas cooled reactors  
. . . **Tory 2-A reactor**  
. nuclear power reactors  
. . . **Tory 2-A reactor**  
. nuclear research and test reactors  
. . . **Tory 2-A reactor**

### Tory 2-C reactor

GS nuclear electric power generation  
. nuclear power reactors  
. . . **Tory 2-C reactor**  
nuclear reactors  
. gas cooled reactors  
. . . **Tory 2-C reactor**  
. nuclear power reactors  
. . . **Tory 2-C reactor**  
. nuclear research and test reactors  
. . . **Tory 2-C reactor**

### TOS-A

USE **ESSA 3 satellite**

### total energy systems

DEF Energy systems which supply both electrical and heat requirements.

GS **total energy systems**  
. solar total energy systems  
RT integrated energy systems  
phosphoric acid fuel cells  
 $\infty$  systems

### total impulse

*(added March 2000)*

DEF The integral of thrust over a given interval of time; the product of thrust and duration expressed in force-seconds; the total thrust produced by a rocket engine or motor over the entire time that its fuel is burning.

GS impulses  
. **total impulse**  
RT propulsion system performance  
propulsive efficiency  
spacecraft propulsion  
specific impulse  
thrust

### Total Ozone Mapping Spectrometer

*(added July 1988)*

UF **TOMS**

GS measuring instruments  
. optical measuring instruments  
. . . photometers  
. . . . ultraviolet spectrometers  
. . . . . **Total Ozone Mapping Spectrometer**  
. radiation measuring instruments  
. . . actinometers  
. . . . ultraviolet detectors  
. . . . . ultraviolet spectrometers  
. . . . . . **Total Ozone Mapping Spectrometer**  
. . . photometers  
. . . . ultraviolet spectrometers  
. . . . . **Total Ozone Mapping Spectrometer**  
. satellite-borne instruments  
. . **Total Ozone Mapping Spectrometer**  
. spectrometers  
. . . ultraviolet spectrometers  
. . . . **Total Ozone Mapping Spectrometer**  
optical equipment  
. optical measuring instruments  
. . . photometers  
. . . . ultraviolet spectrometers  
. . . . . **Total Ozone Mapping Spectrometer**  
RT Antarctic regions  
Nimbus 7 satellite  
ozone depletion  
ozonometry

### total quality management

*(added February 1992)*

UF **TQM (quality control)**  
GS management  
. **total quality management**  
quality control  
. **total quality management**  
RT acceptability  
aircraft reliability  
concurrent engineering  
industrial management  
management methods  
production management  
quality  
reliability  
reliability engineering  
Taguchi methods  
value engineering

*total variation diminishing schemes*

USE **TVD schemes**

### touch

UF *cutaneous perception*  
*tactile sensation*  
GS perception  
. sensory perception  
. . . **touch**  
. . . tactile discrimination  
RT electrocutaneous communication  
skin (anatomy)  
tactile sensors (robotics)

### touchdown

GS landing  
. **touchdown**  
RT aircraft landing  
approach  
approach and landing tests (STS)  
downrange  
spacecraft landing  
vertical landing  
vertical motion  
water landing

### toughness

DEF That property of a material by virtue of which it can absorb work.  
GS mechanical properties  
. **toughness**  
. . . notch sensitivity  
RT abrasion resistance  
brittleness  
compressive strength  
crack initiation  
ductility

- fracture strength  
hardness  
impact tests  
J integral  
shear properties  
tensile strength  
wear resistance
- tourism**  
(added April 1999)  
GS **tourism**  
. space tourism  
RT industries  
recreation  
transportation  
∞ travel
- tourmaline**  
GS aluminum compounds  
. **tourmaline**  
boron compounds  
. **tourmaline**  
minerals  
. **tourmaline**  
silicon compounds  
. silicates  
. . . sodium silicates  
. . . **tourmaline**  
sodium compounds  
. sodium silicates  
. . **tourmaline**  
RT igneous rocks
- Tourmesole satellite*  
USE **D-2 satellites**
- tourniquets**  
GS medical equipment  
. **tourniquets**  
RT blood circulation  
blood flow  
first aid
- Toutatis asteroid**  
(added July 1995)  
GS celestial bodies  
. asteroids  
. . **Toutatis asteroid**  
RT asteroid belts  
meteoroids
- tow missiles**  
GS missiles  
. surface to surface missiles  
. . antitank missiles  
. . . **tow missiles**
- towed bodies**  
UF *drogues*  
*towed targets*  
RT aircraft brakes  
∞ bodies  
brakes (for arresting motion)  
drag chutes  
gliders  
lifting bodies  
parachutes  
sleds  
streamlined bodies  
submerged bodies  
test vehicles  
tetherlines  
towing  
trailers
- towed targets*  
USE **targets**  
**towed bodies**
- Tower Shielding Reactor 2**  
GS nuclear reactors  
. nuclear research and test reactors  
. . **Tower Shielding Reactor 2**  
RT radiation shielding
- towers**  
GS **towers**  
. airport towers  
. umbilical towers  
RT air traffic control
- antennas  
bridges (structures)  
columns (supports)  
concrete structures  
construction industry  
cranes  
pylons  
∞ structures  
tanks (containers)
- towing**  
RT cables (ropes)  
towed bodies  
tractors  
trailers
- Townsend avalanche**  
UF *townsend surfaces*  
GS avalanches  
. **Townsend avalanche**  
RT electromagnetic absorption  
electron avalanche  
ion impact  
secondary emission  
∞ surfaces
- Townsend discharge**  
DEF A type of direct current discharge between two electrodes immersed in a gas and requiring electron emission from the cathode.  
GS electric current  
. electric discharges  
. . **Townsend discharge**  
. . . gas discharges  
. . . . toroidal discharge  
. . . . ring discharge  
RT electrodeless discharges  
ion impact
- townsend surfaces*  
USE **Townsend avalanche**
- toxic diseases**  
UF *poisoning (toxicology)*  
GS diseases  
. **toxic diseases**  
. . benzene poisoning  
. . beryllium poisoning  
. . carbon monoxide poisoning  
. . carbon tetrachloride poisoning  
. . hydrocarbon poisoning  
. . lead poisoning  
RT Clostridium botulinum  
diphtheria  
hyperoxia  
∞ poisoning  
toxicity  
toxicology
- toxic hazards**  
GS hazards  
. **toxic hazards**  
RT aircraft hazards  
biological hazards  
flight hazards  
hazardous materials  
hazardous wastes  
heavy metals  
occupational diseases  
∞ poisoning  
toxicity
- toxicity**  
GS **toxicity**  
. benzene poisoning  
. beryllium poisoning  
. carbon monoxide poisoning  
. carbon tetrachloride poisoning  
. hydrocarbon poisoning  
. lead poisoning  
RT acidosis  
alkalosis  
bioavailability  
chemical properties  
endangered species  
herbicides  
hyperoxia  
poisons  
toxic diseases  
toxic hazards
- toxicology  
toxins and antitoxins  
virulence
- toxicity and safety hazard**  
GS irritation  
. **toxicity and safety hazard**  
RT acroleins  
benzene poisoning  
beryllium poisoning  
carbon tetrachloride poisoning  
chemical properties  
hazardous material disposal (in space)  
hydrocarbon poisoning  
intoxication  
soil pollution
- toxicology**  
RT benzene poisoning  
beryllium poisoning  
bioavailability  
biomarkers  
carbon tetrachloride poisoning  
curare  
endotoxins  
fungicides  
hazards  
hemoperfusion  
hydrocarbon poisoning  
insecticides  
intoxication  
nonpoint sources  
pesticides  
pollution  
red tide  
toxic diseases  
toxicity  
vaccines
- toxins and antitoxins**  
GS **toxins and antitoxins**  
. endotoxins  
. polybrominated biphenyls  
RT biological weapons  
hazardous materials  
immunity  
toxicity  
vaccines
- TQM (quality control)*  
USE **total quality management**
- TRAAC satellite*  
USE **Transit Attitude Control satellite**
- trace contaminants**  
GS contaminants  
. **trace contaminants**  
RT chemical elements  
impurities  
pollution transport  
purity  
∞ tracing
- trace elements**  
RT isotopic labeling  
∞ nutrients  
particle tracks  
siderophile elements  
∞ tracers  
∞ tracing
- TRACE satellite*  
(added May 1998)  
USE **Transition Region and Coronal Explorer**
- ∞ **tracers**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT ammunition  
isotopic labeling  
marking  
trace elements
- trachea**  
GS anatomy  
. respiratory system  
. . **trachea**

## trachyte

RT bronchi  
∞ tubes

### trachyte

GS rocks  
. igneous rocks  
. . **trachyte**  
RT soils  
syenite

### ∞ tracing

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT drawings  
trace contaminants  
trace elements

### tracked vehicles

DEF Land vehicles equipped with continuous roller belts over cogged wheels for moving over rough terrain.

GS surface vehicles  
. motor vehicles  
. . tractors  
. . . **tracked vehicles**  
RT crawler tractors  
∞ vehicles  
vehicular tracks

### tracking (position)

UF *target tracking*  
*tracking studies*  
GS **tracking (position)**  
. compensatory tracking  
. infrared tracking  
. missile tracking  
. multiple target tracking  
. optical tracking  
. photographic tracking  
. polystation doppler tracking system  
. pursuit tracking  
. radar tracking  
. radio tracking  
. . wildlife radiolocation  
. range and range rate tracking  
. space detection and tracking system  
. spacecraft tracking  
. . satellite tracking  
. . . satellite-to-satellite tracking  
. star trackers  
. . CCD star tracker  
. video landmark acquisition and tracking

RT air traffic control  
aircraft detection  
approach control  
detection  
identifying  
instrument landing systems  
laser ranger/tracker  
multispectral tracking telescopes  
position (location)  
rangefinding  
ray tracing  
satellite doppler positioning  
solar sensors  
sound localization  
sound ranging  
tracking problem  
∞ tracks

*Tracking and Data Relay Satellites*  
USE **TDR satellites**

*tracking antennas*

USE **directional antennas**

### tracking filters

DEF Electron devices for attenuating unwanted signals while passing desired signals, by means of phase lock techniques which reduce the effective bandwidth of the circuit and eliminate amplitude variations.

GS electromagnetic wave filters  
. bandpass filters  
. . **tracking filters**  
. electric filters  
. . **tracking filters**  
RT adaptive filters  
bandstop filters

bandwidth  
multiple target tracking  
phase locked systems  
video landmark acquisition and tracking

### tracking networks

GS networks  
. **tracking networks**  
. . Deep Space Network  
. . Global Tracking Network  
. . manned space flight network  
. . MATTS (systems)  
. . polystation doppler tracking system  
. . radar networks  
. . space detection and tracking system  
. . Space Flight Tracking and Data Network  
. . STDN (network)  
RT Advanced Range Instrumentation Ship  
data acquisition  
ground support equipment  
minitrack system  
missile tracking  
Orion (radio interferometry network)  
satellite tracking  
satellite-to-satellite tracking  
spacecraft tracking

### tracking problem

DEF The problem of controlling a system so that the output follows a given path.

RT automatic control  
control theory  
feedback control  
linear systems  
multiple target tracking  
nonlinear systems  
optimal control  
output  
∞ problems  
tracking (position)  
trajectory control  
trajectory optimization

### tracking radar

DEF A radar used for following a target.

GS radar  
. **tracking radar**  
. . Cobra Dane (radar)  
RT coherent radar  
continuous wave radar  
digital radar systems  
monopulse radar  
pulse radar  
radar tracking  
satellite-borne radar  
search radar  
surveillance radar  
TRADEX radar system  
trajectory measurement

### tracking stations

DEF Stations set up to track objects moving through the atmosphere or space, usually by means of radio or radar.

GS stations  
. **tracking stations**  
. . Deep Space Instrumentation Facility  
. . Global Tracking Network  
. . polystation doppler tracking system  
RT ∞ fences  
ground stations  
ground support equipment  
Jodrell Bank Observatory  
∞ mars  
minitrack system  
missile tracking  
radar networks  
satellite tracking  
space detection and tracking system  
Space Flight Tracking and Data Network  
spacecraft tracking

STDN (network)

*tracking studies*

USE **tracking (position)**

### ∞ tracks

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *trails*  
RT conveyors  
ground tracks  
meteor trails  
minitrack system  
particle tracks  
particle trajectories  
smoke trails  
tracking (position)  
vehicular tracks

### traction

RT adhesion  
friction  
pulling

### tractors

GS surface vehicles  
. motor vehicles  
. . **tractors**  
. . . crawler tractors  
. . . tracked vehicles  
RT agriculture  
electric motor vehicles  
ground handling  
handling equipment  
lunar excavation equipment  
materials handling  
planting  
plowing  
sleds  
towing  
transportation  
trucks  
∞ vehicles

*tracts*

USE **sites**

### tradeoffs

RT decision making  
management analysis  
management planning

*Trader aircraft*

USE **C-1A aircraft**

### tradescantia

GS plants (botany)  
. **tradescantia**

### TRADEX radar system

GS radar  
. **TRADEX radar system**  
RT search radar  
∞ systems  
target recognition  
tracking radar

### traffic

GS **traffic**  
. air traffic  
RT accidents  
avoidance  
harbors  
transportation

### traffic control

DEF Control of vehicular traffic such as priority highway lanes, stoplight control, rapid-transit train control, or air traffic control.

GS **traffic control**  
. air traffic control  
. . automated en route ATC  
. . radar approach control  
RT air traffic controllers (personnel)  
airport towers  
approach control  
avoidance  
collision avoidance  
∞ control  
ground based control

- National Aviation System
- tragacanth**  
GS plants (botany)  
. **tragacanth**
- Trailblazer 1 reentry vehicle**  
UF *Trailblazer 1 rocket vehicle*  
GS reentry vehicles  
. **Trailblazer 1 reentry vehicle**  
RT Honest John rocket vehicle  
Lance missile  
multistage rocket vehicles  
Nike-Ajax missile  
rocket vehicles  
solid propellant rocket engines
- Trailblazer 1 rocket vehicle*  
USE **Trailblazer 1 reentry vehicle**
- Trailblazer 2 reentry vehicle**  
UF *Trailblazer 2 rocket vehicle*  
GS reentry vehicles  
. **Trailblazer 2 reentry vehicle**  
RT multistage rocket vehicles  
rocket vehicles  
solid propellant rocket engines  
TX-354 engine
- Trailblazer 2 rocket vehicle*  
USE **Trailblazer 2 reentry vehicle**
- trailers**  
RT automobiles  
couplings  
sleds  
tank trucks  
towed bodies  
towing  
trucks
- trailing edge flaps**  
UF *variable area wings*  
GS airfoils  
. flaps (control surfaces)  
. . wing flaps  
. . . **trailing edge flaps**  
brakes (for arresting motion)  
. aerodynamic brakes  
. . wing flaps  
. . . **trailing edge flaps**  
. aircraft brakes  
. . wing flaps  
. . . **trailing edge flaps**  
control surfaces  
. flaps (control surfaces)  
. . wing flaps  
. . . **trailing edge flaps**  
drag devices  
. aerodynamic brakes  
. . wing flaps  
. . . **trailing edge flaps**  
RT jet flaps  
leading edge slats  
split flaps  
vortex flaps
- trailing edges**  
GS edges  
. **trailing edges**  
. . blunt trailing edges  
RT airfoils  
blunt leading edges  
leading edges  
sharp leading edges  
vortex flaps
- trails*  
USE **tracks**
- trainees*  
USE **students**
- trainers*  
USE **training devices**
- training*  
USE **education**
- training aircraft**  
GS **training aircraft**  
. Alpha jet aircraft  
. jet provost aircraft  
. L-29 jet trainer  
. T-2 aircraft  
. T-28 aircraft  
. T-33 aircraft  
. T-37 aircraft  
. T-38 aircraft  
. T-39 aircraft  
. TS-11 aircraft  
RT ∞ aircraft  
bomber aircraft  
fighter aircraft  
general aviation aircraft  
jet aircraft  
light aircraft  
∞ military aircraft  
∞ subsonic aircraft
- training analysis**  
DEF Evaluation of all facets of instruction -- presentation methods, instructors, effectiveness of training, and testing.  
RT ∞ analyzing  
∞ development  
education  
handbooks  
learning  
personnel development  
planning  
retraining
- training devices**  
UF *trainers*  
GS **training devices**  
. teaching machines  
. training simulators  
. . flight simulators  
. . . cockpit simulators  
. . spacecraft cabin simulators  
RT altitude simulation  
audio visual equipment  
child device  
cockpit simulators  
∞ devices  
education  
educational television  
flight simulators  
multimedia  
onboard equipment  
simulators  
visual aids
- training evaluation**  
DEF Procedures for determining the effectiveness of instruction.  
GS evaluation  
. **training evaluation**  
RT certification  
examination  
instructors  
knowledge  
learning  
∞ performance  
reviewing  
schools  
students
- training simulators**  
UF *simulator training*  
GS simulators  
. **training simulators**  
. . flight simulators  
. . . cockpit simulators  
. . spacecraft cabin simulators  
training devices  
. **training simulators**  
. . flight simulators  
. . . cockpit simulators  
. . spacecraft cabin simulators  
RT astronaut training  
centrifuges  
control simulation  
flight simulation  
flight training  
in-flight simulation  
landing simulation  
lunar orbit and landing simulators  
∞ missile simulators  
pilot training
- space flight training  
virtual reality
- trajectories**  
DEF In general, paths traced by bodies moving as a result of an externally applied force, considered in three dimensions.  
GS **trajectories**  
. abort trajectories  
. ascent trajectories  
. ballistic trajectories  
. descent trajectories  
. . reentry trajectories  
. hyperbolic trajectories  
. interorbital trajectories  
. midcourse trajectories  
. missile trajectories  
. molecular trajectories  
. particle trajectories  
. . electron trajectories  
. rendezvous trajectories  
. round trip trajectories  
. . circumlunar trajectories  
. spacecraft trajectories  
. . interplanetary trajectories  
. . . Earth-Mars trajectories  
. . . Earth-Mercury trajectories  
. . . Earth-Venus trajectories  
. . lunar trajectories  
. . . circumlunar trajectories  
. . . Earth-Moon trajectories  
. . . moon-Earth trajectories  
. spinning unguided rocket trajectory  
. underwater trajectories  
RT apexes  
attractors (mathematics)  
ballistics  
∞ curves  
downrange  
equations of motion  
∞ flight  
flight mechanics  
flight optimization  
flight paths  
flight time  
great circles  
missiles  
orbits  
ordnance  
parabolic flight  
∞ paths  
rocket flight  
space flight  
transfer orbits
- trajectory analysis**  
RT ∞ analyzing  
astrodynamics  
ballistics  
capture effect  
celestial mechanics  
equations of motion  
Goddard Trajectory Determination System  
impact prediction  
mathematical models  
numerical analysis  
orbital mechanics  
preflight analysis  
systems analysis  
trajectory planning
- trajectory control**  
UF *range control*  
GS **trajectory control**  
. trajectory optimization  
RT attitude control  
∞ control  
drift rate  
guidance (motion)  
homing devices  
landing sites  
optimal control  
optimization  
post boost propulsion system  
range safety  
thrust programming  
tracking problem

## trajectory measurement

trajectory planning

**trajectory measurement**

- RT ballistic cameras
- ballistics
- flight mechanics
- ∞ measurement
- telemetry
- tracking radar

**trajectory optimization**

- GS optimization
  - . **trajectory optimization**
- trajectory control
  - . **trajectory optimization**
- RT aircraft maneuvers
- flight mechanics
- flight optimization
- genetic algorithms
- Goddard Trajectory Determination System
- pursuit-evasion games
- tracking problem
- trajectory planning

**trajectory planning**  
(added December 1990)

- UF *path planning*
- GS planning
  - . **trajectory planning**
- RT robot dynamics
- robotics
- trajectory analysis
- trajectory control
- trajectory optimization
- Voronoi diagrams

**tranquilizers**

- GS drugs
  - . **tranquilizers**
- RT central nervous system depressants
- hypertension
- sedatives

*Transall C-160 aircraft*

USE **C-160 aircraft**

**transatmospheric vehicles**

- RT aerospace planes
- aerospace vehicles
- ∞ aircraft
- aircraft design
- National Aerospace Plane Program
- ∞ spacecraft
- spacecraft design
- X-30 vehicle

*transceivers*

USE **transmitter receivers**

**transcendental functions**

- GS functions (mathematics)
  - . **transcendental functions**
  - . . . exponential functions
  - . . . . logarithms
  - . . . periodic functions
  - . . . . trigonometric functions
  - . . . . . cosine series
  - . . . . . sine series
  - . . . . . tangents

**transconductance**

DEF The real part of the transadmittance. Note: Transconductance is, as most commonly used, the interelectrode transconductance between the control grid and the plate. At low frequencies, transconductance is the slope of the control-grid-to-plate transfer characteristic.

- GS electrical properties
  - . electrical impedance
  - . . electrical resistance
  - . . . **transconductance**
  - impedance
  - . electrical impedance
  - . . electrical resistance
  - . . . **transconductance**
- RT ∞ conductivity
- electric potential
- electrodes
- electron tubes

- linear circuits
- low conductivity
- ∞ low resistance
- ohmmeters
- Ohms law
- RC circuits
- reactance
- ∞ resistance
- RL circuits
- RLC circuits
- solid electrodes
- volt-ampere characteristics

**transcontinental systems**

- RT continents
- ∞ systems
- telecommunication
- transportation

**transcription (genetics)**  
(added April 2002)

DEF Transfer of genetic information from DNA to mRNA.

- RT deoxyribonucleic acid
- gene expression
- gene expression regulation
- genetics
- ribonucleic acids

**transducers**

DEF Devices capable of being actuated by energy from one or more other transmission systems or media and of supplying related energy to one or more other transmission systems or media as microphones or thermocouples.

- GS **transducers**
  - . digital transducers
  - . electronic transducers
  - . image transducers
  - . interdigital transducers
  - . magnetic transducers
  - . mode transformers
  - . piezoelectric transducers
  - . . piezoelectric gages
  - . piezoresistive transducers
  - . . piezoelectric gages
  - . pressure sensors
  - . . Bourdon tubes
  - . quartz transducers
  - . sound transducers
  - . . electroacoustic transducers
  - . . . hydrophones
  - . . . loudspeakers
  - . . . microphones
  - . thermopiles
  - . torquers
  - . ultrasonic wave transducers
- RT bulk acoustic wave devices
- control equipment
- ∞ converters
- data converters
- ∞ detectors
- energy conversion efficiency
- extensometers
- form factors
- instrument receivers
- instrument transmitters
- ∞ instruments
- measuring instruments
- meteorological instruments
- photoelectric cells
- ∞ probes
- recording instruments
- remote sensors
- ∞ sensors
- strain gages
- temperature measuring instruments
- ultrasonic cleaning
- vibration meters

**transearth injection**

- GS injection
  - . **transearth injection**
- RT injection guidance
- midcourse guidance
- orbital mechanics
- transfer orbits

**transequatorial propagation**

- GS transmission

- . electromagnetic wave transmission
- . . radio transmission
- . . . **transequatorial propagation**
- . signal transmission
- . . radio transmission
- . . . **transequatorial propagation**
- . wave propagation
- . . **transequatorial propagation**
- RT equators
- F 2 region
- ∞ propagation

*transfer*

USE **transferring**

**transfer functions**

- GS functions (mathematics)
  - . **transfer functions**
  - . . loop transfer functions
  - . . modulation transfer function
  - . . optical transfer function
- RT amplification
- automatic control
- bandwidth
- coupling coefficients
- damping
- dynamic characteristics
- dynamic response
- feedback
- feedback circuits
- high gain
- impedance matching
- logarithmic receivers
- negative feedback
- nonlinear feedback
- Nyquist diagram
- output
- positive feedback
- self oscillation
- sensitivity
- ∞ systems
- time constant
- transient response

**transfer of training**

- GS learning
  - . **transfer of training**
- RT abilities
- education
- generalization (psychology)

**transfer orbits**

DEF In interplanetary travel, elliptical trajectories tangent to the orbits of both the departure planet and the target planet. Used for Hohmann trajectories, Hohmann transfer orbits, and orbital transfer.

- UF *Hohmann trajectories*
- Hohmann transfer orbits*
- orbital transfer*
- GS orbits
  - . elliptical orbits
  - . . **transfer orbits**
  - . . . interplanetary transfer orbits
  - . spacecraft orbits
  - . . **transfer orbits**
  - . . . interplanetary transfer orbits
- RT aeroassist
- aerobraking
- aerocapture
- aeromaneuvering
- circumlunar trajectories
- Earth orbital rendezvous
- Earth orbits
- Earth-Mars trajectories
- Earth-Mercury trajectories
- Earth-Moon trajectories
- Earth-Venus trajectories
- interplanetary trajectories
- lunar orbits
- lunar trajectories
- moon-Earth trajectories
- orbit insertion
- orbital launching
- orbital mechanics
- parking orbits
- planetary orbits
- satellite orbits
- solar orbits
- space rendezvous

spacecraft docking  
trajectories  
transearth injection  
transferring  
translunar injection

*transfer RNA*

USE **ribonucleic acids**

**transfer tunnels**

GS passageways  
. **transfer tunnels**  
RT entrances  
∞ tunnels

**transferred electron devices**

DEF Electronic equipment utilizing diodes exhibiting negative conductance and susceptance. Used for TED.

UF *TED*

GS electronic equipment  
. diodes  
. . semiconductor diodes  
. . . Gunn diodes  
. . . . **transferred electron devices**  
. solid state devices  
. . semiconductor devices  
. . . **transferred electron devices**

RT diffraction radiation  
electron transfer  
gallium arsenides  
indium phosphides  
microwave amplifiers  
microwave oscillators

**transferring**

UF *transfer*

GS **transferring**

. drop transfer  
RT charge transfer  
electron transfer  
energy transfer  
exchanging  
heat transfer  
mass transfer  
materials handling  
momentum transfer  
∞ shift  
technology transfer  
transfer orbits  
transportation

*transform integrals*

USE **integral transformations**

*transformation tensors*

USE **tensors**

∞ **transformations**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

RT Fujita method  
functions (mathematics)  
order-disorder transformations  
phase transformations  
transformations (mathematics)

**transformations (mathematics)**

UF *transforms*

GS **transformations (mathematics)**

. coordinate transformations  
. discrete cosine transform  
. Householder transformations  
. integral transformations  
. . Fourier transformation  
. . . fast Fourier transformations  
. . Fourier-Bessel transformations  
. . Hilbert transformation  
. . Laplace transformation  
. Gabor transformation  
. linear transformations

RT Fujita method  
functions (mathematics)  
gauge invariance  
Racah coefficient  
∞ transformations  
wavelet analysis

**transformers**

GS **transformers**

. instrument transformers  
. mode transformers  
. voltage converters (AC to AC)

RT

amplifiers  
ballasts (impedances)  
circuit protection  
∞ converters  
coupling circuits  
diplexers  
electric coils  
electric filters  
electric motors  
electric reactors  
electrical grounding  
inductance  
magnet coils  
magnetic circuits  
magnetic cores  
oscillators  
phase control  
plasma control  
power supply circuits  
resolvers  
saturable reactors  
solid state devices  
toroids  
up-converters  
voltage regulators

*transforming genes*

(added July 2002)

USE **oncogenes**

*transforms*

USE **transformations (mathematics)**

**transfusion**

RT blood  
first aid  
medical science  
syringes  
veins

**transgranular corrosion**

DEF A slow mode of failure that requires the combined action of stress and aggressive environment where the path of failure runs through the grains producing branched cracking.

GS chemical attack

. **transgranular corrosion**  
corrosion

. **transgranular corrosion**

RT

corrosion tests  
grain boundaries  
intergranular corrosion  
metal fatigue  
protective coatings  
stress corrosion

**transhorizon radio propagation**

GS transmission

. electromagnetic wave transmission  
. . radio transmission  
. . . **transhorizon radio propagation**  
. signal transmission  
. . radio transmissions  
. . . **transhorizon radio propagation**

RT

radio attenuation

radio signals

**transient heating**

GS heating  
. **transient heating**

. . pulse heating  
. . shock heating

RT

aerodynamic heating

**transient loads**

SN (LIMITED TO FORCE LOADS)

GS loads (forces)

. dynamic loads  
. . **transient loads**  
. . . gust loads  
. . . impact loads  
. . . landing loads  
. . . shock loads  
. . . . blast loads

RT

aerodynamic loads  
contact loads  
cyclic loads

random loads  
structural design criteria

**transient oscillations**

GS oscillations

. **transient oscillations**

RT

damping  
electron oscillations  
lasers  
masers  
pilot induced oscillation  
stimulated emission devices  
transverse oscillation

**transient pressures**

GS pressure

. **transient pressures**

RT

mass flow rate  
pressure sensors

**Transient Reactor Test Facility**

UF *TREAT (test facility)*

GS test facilities

. **Transient Reactor Test Facility**

RT

nuclear research and test reactors  
reactor safety  
SNAP

**transient response**

GS dynamic characteristics

. **transient response**

responses

. dynamic response

. . **transient response**

RT

amplification

∞ compensation

damping  
dynamic stability  
impedance  
pressure sensors  
resonant frequencies  
response bias  
sensitivity  
stroking tests  
time constant  
transfer functions

*transients (surges)*

USE **surges**

**transistor amplifiers**

GS amplifiers

. **transistor amplifiers**

electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . **transistor amplifiers**

RT

cascode devices  
current amplifiers  
differential amplifiers  
feedback amplifiers  
intermediate frequency amplifiers  
operational amplifiers  
power amplifiers  
preamplifiers  
transistors

**transistor circuits**

GS circuits

. **transistor circuits**

RT

cascode devices  
DTL integrated circuits  
∞ electronics  
hybrid circuits  
integrated circuits  
linear integrated circuits  
logic circuits  
microelectronics  
printed circuits  
TTL integrated circuits

**transistor logic**

RT Boolean algebra

∞ logic

logic circuits  
logic design  
threshold logic

**transistors**

GS electronic equipment

## transit

- . solid state devices
- .. semiconductor devices
- ... **transistors**
- .... bipolar transistors
- ..... field effect transistors
- ..... charge flow devices
- ..... JFET
- ..... MODFETS
- ..... high electron mobility transistors
- ..... MODFETS
- ..... junction transistors
- ..... JFET
- ..... phototransistors
- ..... silicon transistors
- ..... SOS (semiconductors)
- ..... single electron transistors
- RT cascode devices
- germanium diodes
- ion implantation
- miniaturization
- pentodes
- resonant tunneling
- SIS (semiconductors)
- tetrodes
- transistor amplifiers
- TRAPATT devices
- triodes

*transistor-transistor-logic integ circuits*

USE **TTL integrated circuits**

### ∞ transit

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT occultation
- Transit satellites
- transits

### Transit Attitude Control satellite

- UF *TRAAC satellite*
- GS artificial satellites
- . navigation satellites
- .. **Transit Attitude Control satellite**
- RT ∞ control
- satellite attitude control

### Transit navigation system

- GS satellite navigation systems
- . **Transit navigation system**
- RT NASA programs
- navigation satellites
- Nova satellites
- Transit satellites

### Transit satellites

- GS artificial satellites
- . navigation satellites
- .. **Transit satellites**
- RT Discos (satellite attitude control)
- ∞ transit
- Transit navigation system

### transit time

- SN (NOT LIMITED TO ASTRONOMICAL TIMES OF TRANSIT)
- GS time
- . **transit time**
- RT Barritt diodes
- CATT devices
- flight time
- ∞ motion

### ∞ transition

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT boundary layer transition
- ductile-brittle transition
- electron transitions
- forbidden transitions
- phase transformations

*transition elements (chemistry)*

(added March 2000)

USE **transition metals**

### transition flight

- (added January 1990)
- RT aircraft maneuvers
- ∞ flight
- horizontal flight

- hovering
- V/STOL aircraft
- vertical flight

### transition flow

- GS fluid flow
- . gas flow
- .. molecular flow
- ... **transition flow**
- RT boundary layer thickness
- boundary layer transition
- free molecular flow
- period doubling
- rarefied gas dynamics
- slip flow

### ∞ transition layers

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT boundary layer transition
- interlayers
- laminar flow
- plasma layers
- shear layers
- shock layers
- shock waves
- surface layers
- turbulent flow

### transition metals

- UF *transition elements (chemistry)*
- GS metals
- . **transition metals**
- .. cadmium
- ... cadmium isotopes
- .. chromium
- ... chromium isotopes
- .. cobalt
- ... cobalt isotopes
- .... cobalt 58
- .... cobalt 60
- .. copper
- ... copper isotopes
- .. gold
- ... gold isotopes
- .... gold 198
- .. hafnium
- ... hafnium isotopes
- .. iridium
- ... iridium isotopes
- .. iron
- ... iron isotopes
- .... iron 57
- .... iron 58
- .... iron 59
- .. manganese
- ... manganese isotopes
- .. mercury (metal)
- ... mercury isotopes
- ... mercury vapor
- .. molybdenum
- .. nickel
- ... nickel isotopes
- .. niobium
- ... niobium isotopes
- .... niobium 95
- .. osmium
- ... osmium isotopes
- .. palladium
- .. platinum
- ... platinum isotopes
- .. rhenium
- ... rhenium isotopes
- .. rhodium
- ... rhodium isotopes
- .. ruthenium
- ... ruthenium isotopes
- .. scandium
- ... scandium isotopes
- .. silver
- ... silver isotopes
- .. tantalum
- ... tantalum isotopes
- .. technetium
- ... technetium isotopes
- .. titanium
- ... titanium isotopes
- .. tungsten
- ... tungsten isotopes

- .. vanadium
- ... vanadium isotopes
- .. yttrium
- ... yttrium isotopes
- .. zinc
- ... zinc isotopes
- .. zirconium
- ... zirconium isotopes
- .... zirconium 95
- RT actinide series
- complex compounds
- metal nitrides
- palladium compounds
- rare earth elements
- refractory metals
- ruthenium compounds
- shape memory alloys
- transuranium elements

### transition points

- DEF In aerodynamics, the points of change from laminar to turbulent flow.
- RT boundary layer transition
- ∞ equilibrium
- Knudsen flow
- phase diagrams
- Reynolds number

### transition pressure

- DEF The pressure at which phase transition occurs.
- GS pressure
- . **transition pressure**
- RT high pressure
- hydrostatic pressure
- phase transformations
- pressure effects

### transition probabilities

- RT electron transitions
- excitation
- Fermi surfaces
- nuclear capture
- probability theory
- spectra

### Transition Region and Coronal Explorer

(added May 1998)

- DEF Small Explorer Mission satellite supporting the investigation of the relationships between fine-scale magnetic fields and their associated plasma structures in the transition region and lower corona of the Sun.

- UF *Explorer 73 satellite*
- TRACE satellite*

- GS artificial satellites
- . scientific satellites
- .. Explorer satellites
- ... **Transition Region and Coronal Explorer**
- .. small scientific satellites
- ... **Transition Region and Coronal Explorer**

- RT chromosphere
- SOHO Mission
- solar atmosphere
- solar corona
- solar magnetic field
- solar observatories
- solar physics
- solar transition region

### transition temperature

- DEF An arbitrarily defined temperature within the temperature range in which metal fracture characteristics determined usually by notched tests are changing rapidly such as from primarily fibrous (shear) to primarily crystalline (cleavage) fracture. The arbitrarily defined temperature in a range in which the ductility of a material changes rapidly with temperature.

- GS temperature
- . **transition temperature**
- RT ductile-brittle transition
- glass transition temperature
- heat of fusion
- Kondo effect
- liquid phases
- melting points
- phase diagrams

phase transformations  
 solidification  
 superconducting power transmission  
 superconductivity

**transits**

SN (EXCLUDES PARTIAL OR TOTAL OCCULTATION OF ONE BODY BY ANOTHER)  
 GS measuring instruments  
 . optical measuring instruments  
 . . **transits**  
 . . . theodolites  
 . . . . cinetheodolites  
 optical equipment  
 . optical measuring instruments  
 . . **transits**  
 . . . theodolites  
 . . . . cinetheodolites  
 RT compasses  
 sextants  
 ∞ transit

**translating**

GS **translating**  
 . machine translation  
 RT decoding  
 documentation  
 ∞ interpretation  
 languages  
 technical writing  
 ∞ translators

**translational motion**

GS **translational motion**  
 . three dimensional motion  
 . . three dimensional flow  
 . . . Karman-Bodewadt flow  
 . . . secondary flow  
 RT ∞ motion  
 racks (gears)  
 rigid structures

∞ **translators**

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT computer programs  
 decoders  
 digital to voice translators  
 language programming  
 repeaters  
 translating

**translucence**

GS electromagnetic properties  
 . optical properties  
 . . **translucence**  
 RT light transmission  
 opacity  
 optical density  
 transmissivity  
 transparence

**translunar injection**

GS injection  
 . **translunar injection**  
 RT injection guidance  
 midcourse guidance  
 orbital mechanics  
 transfer orbits

*translunar space*

USE **interplanetary space**

**transmission**

DEF Process by which radiant energy proceeds through any material or object. Used for coaxial transmission.

UF *coaxial transmission*  
 GS **transmission**  
 . demultiplexing  
 . electric power transmission  
 . electromagnetic wave transmission  
 . . light transmission  
 . . . light scattering  
 . . . . halos  
 . . microwave attenuation  
 . . radar transmission  
 . . radio transmission  
 . . . double sideband transmission

. . . ionospheric propagation  
 . . . . ionospheric F-scatter propagation  
 . . . microwave transmission  
 . . . multipath transmission  
 . . . short wave radio transmission  
 . . . single sideband transmission  
 . . . spread spectrum transmission  
 . . . transequatorial propagation  
 . . . transhorizon radio propagation  
 . . scatter propagation  
 . . . ionospheric F-scatter propagation  
 . . television transmission  
 . heat transmission  
 . . heat transfer  
 . . . aerodynamic heat transfer  
 . . . . hypersonic heat transfer  
 . . . . supersonic heat transfer  
 . . . conductive heat transfer  
 . . . convective heat transfer  
 . . . laminar heat transfer  
 . . . radiative heat transfer  
 . . . turbulent heat transfer  
 . multiplexing  
 . . code division multiplexing  
 . . frequency division multiplexing  
 . . time division multiplexing  
 . . wavelength division multiplexing  
 . self propagation  
 . signal transmission  
 . . data transmission  
 . . . automatic picture transmission  
 . . . multiple access  
 . . . . Aloha system  
 . . . . carrier sense multiple access  
 . . . . code division multiple access  
 . . . . demand assignment multiple access  
 . . . . frequency division multiple access  
 . . . . time division multiple access  
 . . . packet transmission  
 . . . . Aloha system  
 . . . single channel per carrier transmission  
 . . microwave attenuation  
 . . radar transmission  
 . . radio transmission  
 . . . double sideband transmission  
 . . . ionospheric propagation  
 . . . . ionospheric F-scatter propagation  
 . . . microwave transmission  
 . . . multipath transmission  
 . . . short wave radio transmission  
 . . . single sideband transmission  
 . . . spread spectrum transmission  
 . . . transequatorial propagation  
 . . . transhorizon radio propagation  
 . . satellite transmission  
 . . telemetry  
 . . . biotelemetry  
 . . . P.A.C.M. telemetry  
 . . . PCM telemetry  
 . . . radio telemetry  
 . . . . pulse frequency modulation telemetry  
 . . television transmission  
 . sound transmission  
 . stress propagation  
 . telephony  
 . wave propagation  
 . . acoustic propagation  
 . . sound propagation  
 . . diffraction propagation  
 . . ground wave propagation  
 . . ionospheric propagation  
 . . . ionospheric F-scatter propagation  
 . . light scattering  
 . . . halos  
 . . scatter propagation  
 . . . ionospheric F-scatter propagation  
 . . shock wave propagation  
 . . transequatorial propagation  
 RT absorptance  
 atmospheric attenuation  
 attenuation  
 broadcasting  
 ∞ conduction

diffraction  
 electromagnetic absorption  
 electromagnetic radiation  
 optical filters  
 output  
 ∞ propagation  
 radar attenuation  
 radio attenuation  
 reflection  
 refraction  
 signal reflection  
 telecommunication  
 transmissivity  
 transmittance  
 wave dispersion

**transmission circuits**

GS circuits  
 . **transmission circuits**  
 RT circuit protection  
 electric power transmission  
 signal stabilization  
 strip transmission lines  
 telecommunication

**transmission efficiency**

GS efficiency  
 . **transmission efficiency**  
 RT Aloha system  
 attenuation coefficients  
 bit error rate  
 carrier to noise ratios  
 data transmission  
 downlinking  
 electromagnetic wave transmission  
 frequency hopping  
 intersymbolic interference  
 network control  
 opacity  
 packet transmission  
 packets (communication)  
 power efficiency  
 signal transmission  
 transmission rate (communications)  
 transmittance  
 uplinking

**transmission electron microscopy**

(added December 1992)  
 DEF A type of electron microscopy in which the specimen transmits an electron beam focused on it. Image contrasts are formed by the scattering of electrons out of the beam. Various magnetic lenses perform functions analogous to those of ordinary lenses in light microscopy.

UF *TEM (microscopy)*  
 GS microscopy  
 . electron microscopy  
 . . **transmission electron microscopy**  
 RT electron beams  
 electron scattering  
 field emission  
 ion microscopes  
 magnetic lenses  
 microanalysis  
 phase contrast  
 scanning tunneling microscopy

**transmission fluids**

RT fluid transmission lines  
 ∞ fluids  
 hydraulic fluids  
 working fluids

**transmission lines**

DEF The conductive connectons between system elements which carry signal power. (2) lines used for electric power transmission.

UF *trunks (lines)*  
 GS **transmission lines**  
 . communication cables  
 . . coaxial cables  
 . . fluid transmission lines  
 . . power lines  
 . . strip transmission lines  
 . . microstrip transmission lines  
 . . submarine cables  
 . . underground transmission lines  
 RT acoustic delay lines



## transmission loss

- antenna couplers
- antenna feeds
- backward waves
- ∞ cables
- circuit protection
- circuits
- delta antennas
- directional couplers
- distributed amplifiers
- electric conductors
- electric current
- electric power transmission
- electric wire
- electrical engineering
- electrification
- harnesses
- impedance matching
- insulators
- ∞ lines
- mode transformers
- nonresonance
- optical fibers
- Smith chart
- standing wave ratios
- superconducting power transmission
- telecommunication
- waveguides
- wiring

### transmission loss

DEF The reduction in the magnitude of some characteristic of a signal between two stated points in a transmission system.

RT attenuation  
current regulators  
electric power transmission  
insertion  
insertion loss  
losses  
lossy media  
silence  
transmission rate (communications)  
voltage regulators  
wave dispersion

### transmission rate (communications)

(added July 1993)

UF *transmission speed (communications)*

GS rates (per time)  
. **transmission rate**  
(communications)

RT access time  
bit error rate  
channel capacity  
data transmission  
delay  
interprocessor communication  
satellite communication  
signal reception  
signal transmission  
telecommunication  
time lag  
transmission efficiency  
transmission loss

*transmission speed (communications)*

USE **transmission rate**  
(communications)

### transmissions (machine elements)

DEF The gearing system by which power is transmitted from the engine to the live axle in an automobile. Also known as gearboxes.

UF *gearboxes*  
GS mechanical drives  
. **transmissions (machine elements)**  
RT gears  
shafts (machine elements)  
torque converters  
torque motors  
vehicle wheels

### transmissivity

DEF Concerning radiation incident upon the boundary between two media, transmissivity is the ratio of the radiation transmitted through the boundary to the component of radiation normal to the boundary.

GS electromagnetic properties  
. optical properties

. . . **transmissivity**  
RT absorptance  
absorptivity  
density (mass/volume)  
light scattering  
opacity  
∞ physical properties  
translucence  
transmission  
transmittance  
transparence  
transponders  
visibility

### transmissometers

GS measuring instruments  
. optical measuring instruments  
. . **transmissometers**  
optical equipment  
. optical measuring instruments  
. . **transmissometers**  
RT densitometers  
photometers  
radiance  
telephotometry  
transmittance

### transmittance

DEF The ratio of the radiant flux transmitted by a medium or a body to the incident flux.

GS electromagnetic properties  
. optical properties  
. . **transmittance**  
RT absorptance  
attenuation coefficients  
density (mass/volume)  
electromagnetic absorption  
infrared absorption  
light (visible radiation)  
optical density  
photometry  
ray tracing  
reflectance  
scattering  
thermochromic coatings  
transmission  
transmission efficiency  
transmissivity  
transmissometers  
transparence

### transmitter receivers

DEF Combinations of transmitters and receivers in single housings, with some components being used by both units. Used for transceivers.

UF *transceivers*  
GS communication equipment  
. radio receivers  
. . **transmitter receivers**  
radio equipment  
. radio receivers  
. . **transmitter receivers**  
. radio transmitters  
. . **transmitter receivers**  
receivers  
. radio receivers  
. . **transmitter receivers**  
transmitters  
. radio transmitters  
. . **transmitter receivers**  
RT interrogation  
transponders

### transmitters

DEF Devices used for the generation of signals of any type and form which are to be transmitted. Used for senders.

UF *senders*  
GS **transmitters**  
. emergency locator transmitters  
. instrument transmitters  
. radar transmitters  
. radio transmitters  
. . radio beacons  
. . . omnidirectional radio ranges  
. . . self calibrating omnirange  
. . radiometeorographs  
. . radiosondes  
. . . ionosondes

. . . rawinsondes  
. . radiotelephones  
. . sonobuoys  
. . transmitter receivers  
. repeaters  
RT antennas  
attenuation  
duplexers  
∞ instruments  
microphones  
receivers  
signal encoding  
telecommunication  
television transmission  
transponders

### transmutation

GS nuclear reactions  
. nuclear transformations  
. . **transmutation**  
RT neutron irradiation  
neutron transmutation doping  
radiogenic materials

### trans-Neptunian objects

(added June 2006)

DEF Solar system objects that orbit the sun at an average distance that is greater than the orbital distance of Neptune.

UF *TNO (astronomy)*  
GS celestial bodies  
. **trans-Neptunian objects**  
. . Charon  
. . Pluto (planet)  
. . Quaoar  
RT asteroids  
Kuiper belt  
Oort cloud  
planetology  
solar system

### transoceanic communication

GS telecommunication  
. **transoceanic communication**  
transoceanic systems  
. **transoceanic communication**  
RT facsimile communication  
radio communication  
Relay satellites

### transoceanic flight

DEF Flight across an ocean.  
RT ∞ flight

### transoceanic systems

GS **transoceanic systems**  
. transoceanic communication  
RT intercontinental ballistic missiles  
ocean data acquisitions systems  
∞ systems  
telecommunication  
transportation  
world data centers

*transonic aircraft*

USE **supersonic aircraft**

*Transonic Aircraft Technology Program*

USE **TACT program**

### transonic compressors

GS compressors  
. **transonic compressors**  
RT supersonic compressors  
turbocompressors

### transonic flight

RT ∞ flight  
rocket flight  
sonic booms  
supersonic flight

### transonic flow

DEF In aerodynamics, flow of a fluid over a body in the range just above and just below the acoustic velocity. Used for sonic flow and transonics.

UF *sonic flow*  
*transonics*  
GS fluid flow

- . compressible flow
- . . **transonic flow**
- RT aerodynamics
- compressibility effects
- ∞ flow
- flow velocity
- gas flow
- nozzle flow
- Ringleb flow
- shock waves
- sonic nozzles
- subsonic flow
- supersonic flow
- trisonic wind tunnels
- wind tunnels
- transonic flutter**
- GS vibration
- . structural vibration
- . . flutter
- . . . **transonic flutter**
- . . self induced vibration
- . . . **transonic flutter**
- RT missile vibration
- subsonic flutter
- supersonic flutter
- transonic inlets*
- USE **supersonic inlets**
- transonic nozzles**
- RT conical nozzles
- convergent-divergent nozzles
- hypersonic nozzles
- ∞ nozzles
- sonic nozzles
- supersonic nozzles
- wind tunnel nozzles
- transonic speed**
- SN (APPROXIMATELY MACH 0. 8 TO 1. 2)
- DEF The speed of a body relative to the surrounding fluid at which the flow is in some places on the body subsonic and in other places supersonic.
- GS rates (per time)
- . **transonic speed**
- velocity
- . **transonic speed**
- RT acoustic velocity
- subsonic speed
- supersonic speed
- transonic turbines*
- USE **supersonic turbines**
- transonic wind tunnels**
- GS test facilities
- . wind tunnels
- . . **transonic wind tunnels**
- RT blowdown wind tunnels
- hypersonic wind tunnels
- slotted wind tunnels
- subsonic wind tunnels
- supersonic wind tunnels
- wing flow method tests
- transonics*
- USE **transonic flow**
- transparence**
- UF *transparent materials*
- GS electromagnetic properties
- . optical properties
- . . **transparence**
- RT absorptance
- absorptivity
- atmospheric optics
- clarity
- density (mass/volume)
- electromagnetic absorption
- haze
- light transmission
- opacity
- optical density
- radome materials
- translucence
- transmissivity
- transmittance
- turbidity
- transparent materials*
- USE **transparence**
- transpiration**
- DEF The passage of gas or liquid through a porous solid (usually under conditions of molecular flow). Used for fluid transpiration.
- UF *fluid transpiration*
- GS phase transformations
- . vaporizing
- . . evaporation
- . . . **transpiration**
- RT cooling
- cooling systems
- evanescence
- evapotranspiration
- evolution (liberation)
- gas evolution
- mass transfer
- molecular flow
- outgassing
- permeating
- perspiration
- plant physiology
- temperature control
- transpiration cooling*
- USE **sweat cooling**
- transplantation**
- RT clinical medicine
- heart implantation
- immunosuppression
- surgery
- transplutonic planets*  
(added June 1998)
- USE **hypothetical planets**
- transponder control group**
- UF *TCG (tracking)*
- RT ∞ control
- radar tracking
- satellite tracking
- spacecraft tracking
- telemetry
- transponders
- transponders**
- DEF Combined receiver and transmitter whose function is to transmit signals automatically when triggered by an interrogator. Used for responders.
- UF *responders*
- GS radio equipment
- . **transponders**
- RT air traffic control
- Beacon Collision Avoidance System
- interrogation
- radar beacons
- radar equipment
- radio receivers
- radio transmitters
- transmissivity
- transmitter receivers
- transmitters
- transponder control group
- transport aircraft**
- GS **transport aircraft**
- . Aladin 2 aircraft
- . AN-2 aircraft
- . AN-22 aircraft
- . AN-24 aircraft
- . Argosy MK-1 aircraft
- . BAC 111 aircraft
- . Boeing 707 aircraft
- . Boeing 720 aircraft
- . Boeing 727 aircraft
- . Boeing 733 aircraft
- . Boeing 737 aircraft
- . Boeing 747 aircraft
- . Boeing 757 aircraft
- . Boeing 767 aircraft
- . Boeing 777 aircraft
- . Boeing 2707 aircraft
- . cargo aircraft
- . . Breguet 941 aircraft
- . . C-1A aircraft
- . . C-2 aircraft
- . . C-5 aircraft
- . . C-9 aircraft
- . . C-15 aircraft
- . . C-17 aircraft
- . . C-33 aircraft
- . . C-35 aircraft
- . . C-46 aircraft
- . . C-47 aircraft
- . . C-54 aircraft
- . . C-118 aircraft
- . . C-119 aircraft
- . . C-121 aircraft
- . . C-123 aircraft
- . . C-124 aircraft
- . . C-130 aircraft
- . . C-131 aircraft
- . . C-133 aircraft
- . . C-135 aircraft
- . . C-140 aircraft
- . . C-141 aircraft
- . . C-160 aircraft
- . . CH-21 helicopter
- . . CL-44 aircraft
- . . DC 3 aircraft
- . . DC 7 aircraft
- . . P-160 aircraft
- . . P-166 aircraft
- . . spanloader aircraft
- . . YC-14 aircraft
- . CH-3 helicopter
- . CH-34 helicopter
- . CH-46 helicopter
- . CH-47 helicopter
- . CH-54 helicopter
- . CL-84 aircraft
- . CL-823 aircraft
- . Concorde aircraft
- . CV-880 aircraft
- . DC 8 aircraft
- . DC 9 aircraft
- . DC 10 aircraft
- . DH 121 aircraft
- . DH 125 aircraft
- . DHC 2 aircraft
- . DHC 4 aircraft
- . DHC 5 aircraft
- . DO-31 aircraft
- . DO-328 aircraft
- . Electra aircraft
- . European Airbus
- . . A-300 aircraft
- . . A-310 aircraft
- . . A-320 aircraft
- . . A-330 aircraft
- . . A-340 aircraft
- . . A-380 aircraft
- . F-27 aircraft
- . F-28 transport aircraft
- . G-1 aircraft
- . G-222 aircraft
- . H-19 helicopter
- . H-53 helicopter
- . H-56 helicopter
- . HC-3 helicopter
- . HFB-320 aircraft
- . IL-14 aircraft
- . IL-76 aircraft
- . IL-86 aircraft
- . IL-96 aircraft
- . L-1011 aircraft
- . L-2000 aircraft
- . light intratheater transport
- . light transport aircraft
- . Lockheed model 18 aircraft
- . MD 11 aircraft
- . MD 80 aircraft
- . MH-262 aircraft
- . Mystere 20 aircraft
- . Mystere 50 aircraft
- . S-58 helicopter
- . S-61 helicopter
- . SA-330 helicopter
- . SC-5 aircraft
- . SC-7 aircraft
- . SH-3 helicopter
- . SH-4 helicopter
- . short haul aircraft

## transport properties

- . . C-8A augmentor wing aircraft
- . . Cessna 402B aircraft
- . . Mercure aircraft
- . Boeing 717 aircraft
- . tanker aircraft
- . TU-124 aircraft
- . TU-144 aircraft
- . TU-154 aircraft
- . TU-204 aircraft
- . UH-34 helicopter
- . UH-60A helicopter
- . UH-61A helicopter
- . VC-10 aircraft
- . very large transport aircraft
- . Viscount aircraft
- . XC-142 aircraft
- . YS-11 aircraft
- RT air transportation
- ∞ aircraft
- commercial aircraft
- general aviation aircraft
- jet aircraft
- light aircraft
- ∞ low wing aircraft
- ∞ military aircraft
- passenger aircraft
- rotary wing aircraft
- ∞ subsonic aircraft
- supersonic aircraft
- ∞ transport vehicles
- turbofan aircraft
- turboprop aircraft
- utility aircraft
- V/STOL aircraft
- water takeoff and landing aircraft

*transport coefficients*

USE **transport properties**

### transport properties

- UF *transport coefficients*
- GS **transport properties**
  - . atmospheric conductivity
  - . . ionospheric conductivity
  - . carrier mobility
  - . . electron mobility
  - . . hole mobility
  - . diffusion coefficient
  - . . Soret coefficient
  - . electrical resistivity
  - . . ionospheric conductivity
  - . . magnetoresistivity
  - . . photoconductivity
  - . . plasma conductivity
  - . . superconductivity
  - . . . Kondo effect
  - . gaseous diffusion
  - . . gaseous self-diffusion
  - . ionic mobility
  - . thermal conductivity
  - . thermal diffusivity
  - . viscosity
  - . . eddy viscosity
  - . . gas viscosity
- RT binary fluids
- Boltzmann transport equation
- ∞ conductivity
- diffusion
- flow coefficients
- Hall effect
- Hall resistance
- heat transfer
- high temperature tests
- kinetic theory
- Lighthill gas model
- mobility
- ∞ physical properties
- pollution transport
- ∞ properties
- radiation transport
- Seebeck effect
- ∞ solid state physics
- thermoelectricity

### transport theory

- GS kinetic theory
- . **transport theory**
- . . Chapman-Enskog theory
- . . Eyring theory
- . . mixing length flow theory

- RT Boltzmann transport equation
- diffusion theory
- gas transport
- integral equations
- molecular interactions
- Monte Carlo method
- pollution transport
- reaction-diffusion equations
- ∞ theories

### ∞ transport vehicles

- SN ((USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW))
- RT crawler tractors
- ground effect machines
- rapid transit systems
- ships
- transport aircraft
- ∞ vehicles

### transportation

- GS **transportation**
  - . air transportation
  - . marine transportation
  - . rail transportation
  - . rapid transit systems
  - . space transportation
  - . . space transportation system
  - . . . Advanced Launch System (STS)
  - . . . Saenger space transportation system
- RT . urban transportation
- artificial harbors
- automated guideway transit vehicles
- automated transit vehicles
- cargo
- contractors
- conveyors
- deepwater terminals
- delivery
- distributing
- ∞ distribution
- electric automobiles
- evacuating (transportation)
- freight costs
- freighters
- handling equipment
- hauling
- highways
- logistics
- materials handling
- missiles
- logistics
- motor vehicles
- offshore docking
- offshore platforms
- packaging
- passengers
- pipelines
- riding quality
- roads
- routes
- services
- site selection
- tanker terminals
- terminal facilities
- tourism
- tractors
- traffic
- transcontinental systems
- transferring
- transoceanic systems
- transportation networks
- ∞ travel
- trucks

### transportation energy

- RT allocations
- cargo
- commercial energy
- distributing
- domestic energy
- economic factors
- ∞ energy
- energy conversion
- engines
- fuels
- hauling
- industrial energy
- ships

- ∞ tankers
- trucks

### transportation networks

- DEF Networks of highways, railways, subways, etc., for the movement of passenger and cargo.
- RT highways
- intersections
- rapid transit systems
- roads
- transportation

### transporter

- GS surface vehicles
- . **transporter**
- RT ∞ containers
- ∞ vehicles

### transputers

- (added August 1989)
- GS data processing equipment
- . computers
- . . **transputers**
- RT architecture (computers)
- distributed processing
- interprocessor communication
- microprocessors
- parallel processing (computers)

### transuranium elements

DEF Elements above uranium in the periodic table, that is, with an atomic number greater than 92.

- GS chemical elements
- . actinide series
- . . **transuranium elements**
- . . . americium
- . . . . americium isotopes
- . . . . . americium 241
- . . . berkelium
- . . . californium
- . . . . californium isotopes
- . . . curium
- . . . . curium isotopes
- . . . . . curium 242
- . . . . . curium 244
- . . . einsteinium
- . . . fermium
- . . . lawrencium
- . . . mendelevium
- . . . neptunium
- . . . . neptunium isotopes
- . . . nobelium
- . . . plutonium
- . . . . plutonium isotopes
- . . . . . plutonium 238
- . . . . . plutonium 239
- . . . . . plutonium 240
- . . . . . plutonium 241
- . . . . . plutonium 244
- . . . sergenium
- . nuclides
- . . isotopes
- . . . radioactive isotopes
- . . . . **transuranium elements**
- . . . . . americium
- . . . . . . americium isotopes
- . . . . . . . americium 241
- . . . . . berkelium
- . . . . . californium
- . . . . . . californium isotopes
- . . . . . . . curium
- . . . . . . . . curium isotopes
- . . . . . . . . . curium 242
- . . . . . . . . . curium 244
- . . . . . einsteinium
- . . . . . fermium
- . . . . . lawrencium
- . . . . . mendelevium
- . . . . . neptunium
- . . . . . . neptunium isotopes
- . . . . . nobelium
- . . . . . plutonium
- . . . . . . plutonium isotopes
- . . . . . . . plutonium 238
- . . . . . . . plutonium 239
- . . . . . . . plutonium 240
- . . . . . . . plutonium 241
- . . . . . . . plutonium 244

. . . . . sergenium  
 metals  
 . actinide series  
 . . **transuranium elements**  
 . . . americium  
 . . . . . americium isotopes  
 . . . . . americium 241  
 . . . berkelium  
 . . . californium  
 . . . . . californium isotopes  
 . . . curium  
 . . . . . curium isotopes  
 . . . . . curium 242  
 . . . . . curium 244  
 . . . einsteinium  
 . . . fermium  
 . . . lawrencium  
 . . . mendeleevium  
 . . . neptunium  
 . . . . . neptunium isotopes  
 . . . nobelium  
 . . . plutonium  
 . . . . . plutonium isotopes  
 . . . . . plutonium 238  
 . . . . . plutonium 239  
 . . . . . plutonium 240  
 . . . . . plutonium 241  
 . . . . . plutonium 244  
 . . . sergenium  
 RT transition metals  
  
**transverse acceleration**  
 GS rates (per time)  
 . acceleration (physics)  
 . . **transverse acceleration**  
 RT ∞ acceleration  
 acceleration measurement  
 acceleration stresses (physiology)  
 angular acceleration  
 transverse momentum  
  
**transverse loads**  
 (added June 1992)  
 GS loads (forces)  
 . **transverse loads**  
 RT dynamic loads  
 force distribution  
 load distribution (forces)  
 loading moments  
 shear stress  
 static loads  
 stress distribution  
 stresses  
  
**transverse momentum**  
 (added June 1999)  
 GS momentum  
 . **transverse momentum**  
 RT angular momentum  
 elementary particle interactions  
 particle motion  
 transverse acceleration  
  
**transverse oscillation**  
 DEF Oscillation in which the direction of motion of the particles is perpendicular to the direction of advance of the oscillatory motion in contrast with longitudinal oscillation, in which the direction of motion in the same as that of advance. Used for transverse vibration.  
 UF *transverse vibration*  
 GS oscillations  
 . **transverse oscillation**  
 . . H waves  
 RT gamma rays  
 harmonic oscillation  
 lateral oscillation  
 stable oscillations  
 transient oscillations  
  
*transverse vibration*  
 USE **transverse oscillation**  
  
**transverse waves**  
 DEF Waves in which the direction of displacement at each point of the medium is parallel to the wave front.  
 GS **transverse waves**  
 . H waves  
 RT elastic waves

electromagnetic radiation  
 gamma rays  
 longitudinal waves  
 magnetohydrodynamic flow  
 plane waves  
 radio waves  
 S waves  
 SH waves  
 vibration mode  
 wave packets  
 ∞ waves  
  
*transversely excited atmospheric lasers*  
 USE **TEA lasers**  
  
**TRAP program**  
 GS programs  
 . **TRAP program**  
 RT plasma control  
 ∞ radiation  
  
**TRAPATT devices**  
 UF *trapped plasma avalanche triggered transit*  
 GS electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . **TRAPATT devices**  
 RT avalanche diodes  
 ∞ devices  
 diodes  
 transistors  
  
*TRAPATT diodes*  
 USE **avalanche diodes**  
  
**trapezoidal tail surfaces**  
 GS assemblies  
 . tail assemblies  
 . . **trapezoidal tail surfaces**  
 planforms  
 . **trapezoidal tail surfaces**  
 tail surfaces  
 . **trapezoidal tail surfaces**  
 RT control surfaces  
 horizontal tail surfaces  
 hypersonic aircraft  
 rudders  
 stabilizers (fluid dynamics)  
 supersonic aircraft  
 ∞ surfaces  
 sweptback tail surfaces  
  
**trapezoidal wings**  
 GS airfoils  
 . wings  
 . . low aspect ratio wings  
 . . . **trapezoidal wings**  
 . . swept wings  
 . . . swept forward wings  
 . . . . **trapezoidal wings**  
 . . . sweptback wings  
 . . . . **trapezoidal wings**  
 planforms  
 . wing planforms  
 . . swept forward wings  
 . . . **trapezoidal wings**  
 . . sweptback wings  
 . . . **trapezoidal wings**

. . . radiation belts  
 . . . . . artificial radiation belts  
 . . . . . inner radiation belt  
 . . . . . outer radiation belt  
 . . . proton belts  
 RT charged particles  
 electron precipitation  
 laser cooling  
 proton precipitation  
 trapping  
  
*trapped plasma avalanche triggered transit*  
 USE **TRAPATT devices**  
  
**trapped vortices**  
 (added August 1989)  
 DEF Air flow in rotary motion but trapped relative to leading edge vortex separation, which increases not only lift but also drag. The trapped vortices result in thrust and reduced drag. Used for vortex traps.  
 UF *vortex traps*  
 GS vortices  
 . **trapped vortices**  
 RT counterflow  
 flow distribution  
 mixing  
 rotating fluids  
 rotating liquids  
 turbulent mixing  
 turbulent wakes  
 vortex rings  
 vorticity  
  
**trapping**  
 GS **trapping**  
 . cryotrapping  
 RT conduction bands  
 crystal defects  
 flux pinning  
 ion storage  
 phosphorescence  
 radiation belts  
 trapped magnetic fields  
 trapped particles  
  
**traps**  
 GS **traps**  
 . cold traps  
 . ion traps (instrumentation)  
 . vapor traps  
 RT concentrators  
 entrapment  
 separators  
 valves  
  
 ∞ **travel**  
 SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
 RT distance  
 harbors  
 logistics  
 range (extremes)  
 tourism  
 transportation  
  
**traveling charge**  
 GS electric charge  
 . **traveling charge**  
 RT electrostatics  
 energy dissipation  
 field theory (physics)  
  
**traveling ionospheric disturbances**  
 DEF Atmospheric gravity waves originating at the auroral oval or at the terminator with speeds of 1000 km/hour over the Earth's surface. Due to interaction between the neutral atmosphere and the ionosphere, they result in temporary enhancements and depletions of the ionosphere that travel with the gravity waves.  
 UF *TID*  
 GS ionospheric disturbances  
 . **traveling ionospheric disturbances**  
 RT gravity waves  
 ionospheric currents  
 ionospheric propagation  
 ionospheric storms  
 ionospheric tilts

## traveling salesman problem

magnetic variations  
sudden ionospheric disturbances

### traveling salesman problem

RT operations research  
probability theory  
∞ problems  
statistical analysis

### traveling solvent method

SN (LIMITED TO CRYSTAL GROWTH  
TECHNIQUES)  
GS growth  
. crystal growth  
. . **traveling solvent method**  
RT additives  
carrier injection  
electroepitaxy  
∞ methodology

### traveling wave amplifiers

GS amplifiers  
. **traveling wave amplifiers**  
RT amplifier design  
power amplifiers  
traveling wave tubes

### traveling wave masers

GS stimulated emission devices  
. masers  
. . **traveling wave masers**  
RT amplifiers  
cavity resonators  
coherent electromagnetic radiation

### traveling wave modulation

GS modulation  
. **traveling wave modulation**  
RT lasers  
light modulation  
wave diffraction

### traveling wave tubes

DEF Electron tubes in which streams of electrons interact continuously or repeatedly with guided electromagnetic waves moving substantially in synchronism with them, and in such a way that there is a net transfer of energy from the streams to the waves. Used for crestatrons and helix tubes.

UF *crestatrons*  
*helix tubes*  
GS electron tubes  
. vacuum tubes  
. . microwave tubes  
. . . **traveling wave tubes**  
. . . . backward wave tubes  
. . . . helitrons  
. . . . carcinotrons  
microwave equipment  
. microwave tubes  
. . **traveling wave tubes**  
. . . backward wave tubes  
. . . . helitrons  
. . . . carcinotrons  
RT backward waves  
Brillouin flow  
crossed field amplifiers  
cyclotron resonance devices  
electron bunching  
magnetostatic amplifiers  
magnetrons  
microwave oscillators  
oscillations  
scalping  
traveling wave amplifiers

### traveling waves

GS **traveling waves**  
. solitary waves  
RT backward waves  
elastic waves  
electromagnetic radiation  
nonresonance  
phase velocity  
plane waves  
radio waves

### trays

RT ∞ buckets  
∞ containers

∞ plates

### treadmills

RT physical exercise  
physical fitness  
physical work  
physiological tests

### treads

RT stairways  
tires  
vehicular tracks

### TREAT (test facility)

USE **Transient Reactor Test Facility**

### ∞ treatment

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
UF *conditioning (treating)*  
RT air conditioning  
clinical medicine  
heat treatment  
prewhitening  
sewage treatment  
surface treatment  
thermomechanical treatment  
waste treatment  
water treatment

### tree ring dating

USE **dendrochronology**

### ∞ trees

SN (USE OF A MORE SPECIFIC TERM IS  
RECOMMENDED--CONSULT THE TERMS  
LISTED BELOW)  
RT conifers  
trees (mathematics)  
trees (plants)

### trees (mathematics)

GS **trees (mathematics)**  
. fault trees  
RT analysis (mathematics)  
circuits  
graph theory  
graphs (charts)  
∞ nets  
Petri nets  
sneak circuit analysis  
topology  
∞ trees

### trees (plants)

DEF Woody plants having one well defined stem and a more or less definitely formed crown, usually attaining a height of at least 8 feet.

GS plants (botany)  
. **trees (plants)**  
. . citrus trees  
. . conifers  
. . deciduous trees  
RT balsa  
canopies (vegetation)  
chaparral  
clearings (openings)  
defoliant  
defoliation  
dendrochronology  
forests  
geobotany  
herbicides  
logging (industry)  
Masonite (trademark)  
orchards  
phreatophytes  
plywood  
silviculture  
timber identification  
timber inventory  
timber vigor  
timberline  
∞ trees  
vegetation  
wood

### Trefftz method

(added July 1998)

DEF Boundary-type approximation scheme for the solution of boundary value problems for

partial differential equations.

UF *hybrid-Trefftz finite element method*  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . boundary element method  
. . . . **Trefftz method**  
RT bending theory  
boundary conditions  
boundary value problems  
finite element method  
partial differential equations  
plate theory  
structural analysis

### trellis coding

(added August 1991)

DEF A 'sliding window' method of encoding a binary data stream into a sequence of real numbers that are input to a noisy transmission channel.

GS coding  
. signal encoding  
. . **trellis coding**  
RT binary codes  
channel noise  
∞ codes  
concatenated codes  
convolution integrals  
phase modulation  
phase shift keying

### tremors

RT earthquake resistance  
earthquakes  
paralysis  
Parkinson disease  
Rouse belts

### trend analysis

(added May 1989)

DEF A management tool for evaluating variation in data with the ultimate objective of forecasting future events based upon an examination of past results.

GS information analysis  
. **trend analysis**  
RT ∞ analyzing  
data mining  
failure analysis  
performance prediction  
prediction analysis techniques  
regularity  
reliability analysis  
statistical analysis  
time series analysis  
trends

### trends

RT extrapolation  
forecasting  
growth  
periodic variations  
∞ projection  
time series analysis  
trend analysis

### Tresca flow

GS fluid flow  
. plastic flow  
. . **Tresca flow**  
RT ductility  
stability  
yield point

### triacetin

GS acetates  
. **triacetin**  
esters  
. **triacetin**  
RT acetic acid  
glycerols  
plasticizers  
solvents

### triaminoguanidinenitrate

USE **TAGN**

### triaminoguanidinium azide

GS nitrogen compounds

. azides (organic)  
 . . **triaminoguanidinium azide**  
 organic compounds  
 . amines  
 . . diamines  
 . . . guanidines  
 . . . . **triaminoguanidinium azide**

*triaminotrinitrobenzene*  
 USE **TATB**

**triangles**  
 GS geometry  
 . Euclidean geometry  
 . . polygons  
 . . . **triangles**  
 RT tetrahedrons  
 trigonometry

*triangular wings*  
 USE **delta wings**

**triangulation**  
 RT angles (geometry)  
 mapping  
 navigation  
 trigonometry  
 wildlife radiolocation

**triatomic molecules**  
 GS molecules  
 . polyatomic molecules  
 . . **triatomic molecules**  
 RT diatomic molecules

**triaxial stresses**  
 UF *triaxiality*  
 GS stresses  
 . **triaxial stresses**  
 RT mechanical properties  
 tensile stress

*triaxiality*  
 USE **triaxial stresses**

**tribolia**  
 GS animals  
 . invertebrates  
 . . arthropods  
 . . . insects  
 . . . . Coleoptera  
 . . . . . beetles  
 . . . . . **tribolia**

**tribology**  
 DEF Science of friction, wear, and lubrication.  
 RT abrasion  
 corrosion  
 erosion  
 erosive burning  
 fretting  
 friction  
 interfacial tension  
 lubrication  
 triboluminescence  
 tribometers  
 vapor phase lubrication  
 wear

**triboluminescence**  
 DEF The emission of light caused by application of mechanical energy to a solid.  
 GS emission  
 . light emission  
 . . luminescence  
 . . . photoluminescence  
 . . . . **triboluminescence**  
 RT fluorescence  
 friction  
 mechanical properties  
 photoluminescent bands  
 stresses  
 tribology

**tribometers**  
 (*added September 2002*)  
 DEF Instruments and related methods for determining the degree of friction between two bodies.  
 GS measuring instruments

. **tribometers**  
 RT friction  
 friction measurement  
 ∞ instruments  
 lubricant tests  
 sliding friction  
 tribology  
 wear tests

*tribometry*  
 (*added September 2002*)  
 USE **friction measurement**

**tributaries**  
 RT drainage patterns  
 Earth resources  
 estuaries  
 rivers

*trichlorides*  
 USE **chlorides**

**trichloroethylene**  
 (*added September 1995*)  
 GS halogen compounds  
 . chlorine compounds  
 . . **trichloroethylene**  
 organic compounds  
 . ethylene compounds  
 . . chloroethylene  
 . . . **trichloroethylene**  
 RT cleaning  
 reduction (chemistry)  
 solvents

*Trident aircraft*  
 USE **DH 121 aircraft**

**trident submarine**  
 GS water vehicles  
 . ships  
 . . submarines  
 . . . **trident submarine**  
 . underwater vehicles  
 . . submarines  
 . . . **trident submarine**  
 RT navy  
 nuclear propulsion

**trienes**  
 GS organic compounds  
 . hydrocarbons  
 . . aliphatic hydrocarbons  
 . . . alkenes  
 . . . . **trienes**

**triethyl compounds**  
 GS alkyl compounds  
 . **triethyl compounds**  
 RT ∞ chemical compounds  
 diethyl compounds  
 ethyl compounds

**trifluoroamine oxide**  
 GS halogen compounds  
 . fluorine compounds  
 . . fluoro compounds  
 . . . fluorine organic compounds  
 . . . . fluoroamines  
 . . . . . **trifluoroamine oxide**  
 organic compounds  
 . amines  
 . . fluoroamines  
 . . . **trifluoroamine oxide**  
 . fluorine organic compounds  
 . . fluoroamines  
 . . . **trifluoroamine oxide**

**trigatrons**  
 GS switches  
 . **trigatrons**  
 RT ∞ gas tubes  
 pulse modulation  
 spark gaps  
 trigger circuits

**trigger circuits**  
 DEF Circuits that have two conditions of stability, with means for passing from one to the other when certain conditions are satisfied, ei-

ther spontaneously or through application of an external stimulus.  
 GS circuits  
 . **trigger circuits**  
 RT anticoincidence detectors  
 bistable circuits  
 gates (circuits)  
 multivibrators  
 threshold gates  
 threshold logic  
 thyristors  
 trigatrons

*triggers*  
 USE **actuators**

**trigonometric functions**  
 GS analysis (mathematics)  
 . real variables  
 . . periodic functions  
 . . . **trigonometric functions**  
 . . . . cosine series  
 . . . . sine series  
 . . . . tangents  
 functions (mathematics)  
 . transcendental functions  
 . . periodic functions  
 . . . **trigonometric functions**  
 . . . . cosine series  
 . . . . sine series  
 . . . . tangents  
 RT Fresnel integrals  
 sine waves  
 trigonometry

**trigonometry**  
 GS geometry  
 . Euclidean geometry  
 . . analytic geometry  
 . . . **trigonometry**  
 RT angles (geometry)  
 ∞ science  
 triangles  
 triangulation  
 trigonometric functions

*trim (balance)*  
 USE **aerodynamic balance**

**trimers**  
 GS oligomers  
 . **trimers**  
 prepolymers  
 . **trimers**  
 RT dimers  
 monomers

**trimethadione**  
 GS drugs  
 . **trimethadione**  
 ketones  
 . **trimethadione**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . **trimethadione**

**trimethyl compounds**  
 GS alkyl compounds  
 . **trimethyl compounds**  
 RT ∞ chemical compounds  
 dimethyl compounds  
 methyl compounds

**Trinidad and Tobago**  
 GS landforms  
 . islands  
 . . West Indies  
 . . . **Trinidad and Tobago**  
 nations  
 . **Trinidad and Tobago**  
 RT Caribbean region  
 South America

**trinitramine**  
 GS nitrogen compounds  
 . **trinitramine**  
 organic compounds  
 . amines

## trinitro compounds

. . . **trinitramine**

**trinitro compounds**  
GS nitrogen compounds  
. nitro compounds  
. . . **trinitro compounds**  
RT ∞ chemical compounds

**trinitrotoluene**  
UF *TNT (trinitrotoluene)*  
GS explosives  
. **trinitrotoluene**  
. nitrogen compounds  
. nitro compounds  
. . nitrobenzenes  
. . . **trinitrotoluene**  
RT exposure

*trinitrotriazocyclohexane*  
USE **RDX**

**triodes**  
RT CATT devices  
diodes  
electron tubes  
microwave tubes  
semiconductor devices  
tetrodes  
thyristors  
transistors

**triols**  
GS hydroxyl compounds  
. alcohols  
. . **triols**  
. . . cyanuric acid

**triphenyl silicon**  
GS organic compounds  
. organic silicon compounds  
. . **triphenyl silicon**  
silicon compounds  
. organic silicon compounds  
. . **triphenyl silicon**

**triphenyls**  
GS organic compounds  
. hydrocarbons  
. . **triphenyls**  
phenyls  
. polyphenyls  
. . **triphenyls**

*triple axis spectrometers*  
USE **neutron spectrometers**

**triple stars**  
(added October 1988)  
GS celestial bodies  
. stars  
. . **triple stars**  
RT binary stars  
companion stars  
stellar systems  
three body problem

*triplet excitation*  
USE **atomic energy levels**

*triplet state*  
USE **atomic energy levels**

**tripods**  
GS supports  
. **tripods**  
RT optical equipment

*tripropellants*  
USE **liquid rocket propellants**

**trisonic wind tunnels**  
DEF Wind tunnels designed for subsonic, transonic, and supersonic flows.  
GS test facilities  
. wind tunnels  
. . **trisonic wind tunnels**  
RT slotted wind tunnels  
transonic flow

wind tunnel tests

**tritium**  
UF *hydrogen 3*  
GS chemical elements  
. hydrogen  
. . hydrogen isotopes  
. . . **tritium**  
. nuclides  
. . isotopes  
. . . hydrogen isotopes  
. . . . **tritium**  
. . . . radioactive isotopes  
. . . . **tritium**  
gases  
. hydrogen  
. . hydrogen isotopes  
. . . **tritium**  
RT heavy water  
nuclear fuels

**Triton**  
DEF One of the two satellites of the planet Neptune, with a diameter of about 4800 kilometers, orbiting at a mean distance of 354,000 kilometers.  
GS celestial bodies  
. natural satellites  
. . Neptune satellites  
. . . **Triton**  
RT Galilean satellites  
Neptune (planet)  
Neptune atmosphere  
satellite atmospheres  
Titan

**tritons**  
GS ions  
. **tritons**  
particles  
. charged particles  
. . energetic particles  
. . . nuclei (nuclear physics)  
. . . . **tritons**  
. . . . corpuscular radiation  
. . . . energetic particles  
. . . . nuclei (nuclear physics)  
. . . . **tritons**  
RT alpha particles  
protons

**trivalent ions**  
GS ions  
. **trivalent ions**  
RT free radicals  
positive ions  
valence

**TRMM satellite**  
(added May 1998)  
DEF Satellite supporting the joint US-Japanese Tropical Rainfall Measuring Mission (TRMM) to explore tropical rainfall and its effects on the Earth energy budget, general circulation, and climate. The TRMM satellite represents the first dual deployment of a precipitation radar and passive microwave radiometer on an Earth-viewing satellite.

UF *Tropical Rainfall Measuring Mission sat*  
GS artificial satellites  
. meteorological satellites  
. . **TRMM satellite**  
. . scientific satellites  
. . . **TRMM satellite**  
RT atmospheric circulation  
CERES (experiment)  
Earth radiation budget  
equatorial atmosphere  
rain  
tropical meteorology

*trochoids*  
USE **pivots**

**troilite**  
GS chalcogenides  
. sulfides  
. . pyrrhotite  
. . . **troilite**

iron compounds  
. pyrrhotite  
. . **troilite**  
minerals  
. pyrrhotite  
. . **troilite**  
sulfur compounds  
. sulfides  
. . pyrrhotite  
. . . **troilite**  
RT iron meteorites  
meteoritic composition

*Trojan aircraft*  
USE **T-28 aircraft**

**Trojan asteroids**  
(added August 2000)  
DEF Any asteroid that orbits in the Lagrange points of another (larger) body. In particular, those asteroids with a revolution period approximately equal to that of Jupiter (1:1 resonance) and clustered at either of the two Lagrange points--60 degrees ahead of or behind the Jupiter. Most asteroids of this group are named after the heroes of the Trojan War.

GS celestial bodies  
. asteroids  
. . **Trojan asteroids**  
RT Jupiter (planet)  
Lagrangian equilibrium points  
three body problem  
Trojan orbits

**Trojan orbits**  
GS orbits  
. **Trojan orbits**  
RT celestial mechanics  
many body problem  
three body problem  
Trojan asteroids

**Trombe walls**  
DEF Structures with passive solar collectors in the walls.  
GS walls  
. **Trombe walls**  
RT energy technology  
heat storage  
phase change materials  
radiative heat transfer  
solar energy absorbers  
solar heating  
solar houses  
thermal insulation

**tropical meteorology**  
GS meteorology  
. **tropical meteorology**  
RT agrometeorology  
el Nino  
equatorial atmosphere  
GARP Atlantic Tropical Experiment  
intertropical convergent zones  
intraseasonal variations  
Madden-Julian Oscillation  
meteorological parameters  
quasi-biennial oscillation  
TRMM satellite

*Tropical Rainfall Measuring Mission sat*  
(added May 1998)  
USE **TRMM satellite**

**tropical regions**  
UF *jungles*  
*low latitudes*  
*subtropical regions*  
*tropics*  
GS regions  
. **tropical regions**  
. . Amazon region (South America)  
. . . intertropical convergent zones  
RT climatology  
equatorial atmosphere  
equatorial regions  
GARP Atlantic Tropical Experiment  
geography  
hot weather  
laterites

- Lomonosov current  
 meteorology  
 rain forests  
 temperate regions  
 Virgin Islands
- tropical storms**  
 GS storms  
 . storms (meteorology)  
 . . **tropical storms**  
 . . . hurricanes  
 . . . . Anna hurricane  
 . . . typhoons  
 RT atmospheric circulation  
 cyclones  
 meteorology  
 storm damage  
 tornadoes
- tropics*  
 USE **tropical regions**
- tropism**  
 GS **tropism**  
 . aeolotropism  
 . geotropism  
 . gravitropism  
 . gyrotropism  
 . neurotropism
- tropopause**  
 SN (ALTITUDE APPROXIMATELY 15 TO 20 KM)  
 DEF The boundary between the troposphere and the stratosphere, usually characterized by an abrupt change of lapse rate. The change is in the direction of increased atmospheric stability from regions below to regions above the tropopause. Its height varies from 15 to 20 kilometers in the tropics to about 10 kilometers in polar regions. In polar regions in winter it is often difficult or impossible to determine just where the tropopause lies, since under some conditions there is no abrupt change in lapse rate at any height.  
 GS Earth atmosphere  
 . lower atmosphere  
 . . troposphere  
 . . . **tropopause**  
 RT diurnal variations  
 isothermal layers  
 middle atmosphere
- troposphere**  
 SN (GROUND LEVEL TO APPROXIMATELY 15 KM)  
 DEF That portion of the atmosphere from the Earth's surface to the stratosphere; that is, the lowest 10 to 20 kilometers of the atmosphere. The troposphere is characterized by decreasing temperature with height, appreciable vertical wind motion, appreciable water vapor content, and weather. Dynamically, the troposphere can be divided into the following layers: surface boundary layer, Ekman layer, and free atmosphere.  
 GS Earth atmosphere  
 . lower atmosphere  
 . . **troposphere**  
 . . . tropopause  
 RT chemosphere  
 homosphere  
 Intasat satellite
- tropospheric radiation**  
 SN (EXCLUDES TERRESTRIAL RADIATION)  
 GS atmospheric radiation  
 . **tropospheric radiation**  
 electromagnetic radiation  
 . **tropospheric radiation**  
 RT  $\infty$  radiation  
 sky radiation  
 stratosphere radiation  
 terrestrial radiation
- tropospheric scattering**  
 GS scattering  
 . wave scattering  
 . . atmospheric scattering  
 . . . **tropospheric scattering**  
 RT light scattering
- wideband communication
- tropospheric waves**  
 SN (EXCLUDES RADIO WAVES)  
 DEF Radio waves that are propagated by reflection from a place of abrupt change in the dielectric constant or its gradient in the troposphere.  
 GS **tropospheric waves**  
 . planetary waves  
 RT elastic waves  
 lee waves  
 radio waves  
 surface waves  
 $\infty$  waves
- tropyl compounds**  
 GS bases (chemical)  
 . alkaloids  
 . . **tropyl compounds**  
 nitrogen compounds  
 . alkaloids  
 . . **tropyl compounds**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . alkaloids  
 . . . . **tropyl compounds**  
 RT  $\infty$  chemical compounds
- troubleshooting*  
 USE **maintenance**
- troughs**  
 RT canals  
 ditches  
 irrigation  
 low pressure
- trucks**  
 SN (EXCLUDES UNDERCARRIAGES)  
 UF *vans*  
 GS surface vehicles  
 . motor vehicles  
 . . **trucks**  
 . . . tank trucks  
 RT antiskid devices  
 automobiles  
 cargo  
 delivery  
 dollies  
 electric motor vehicles  
 ground handling  
 hauling  
 materials handling  
 $\infty$  military vehicles  
 recovery vehicles  
 tractors  
 trailers  
 transportation  
 transportation energy
- truncation (mathematics)*  
 USE **approximation**
- truncation errors**  
 DEF In computations, the errors resulting from the use of only a finite number of terms of an infinite series or from the approximation of operations in the infinitesimal calculus by operations in the calculus of finite differences.  
 GS analysis (mathematics)  
 . numerical analysis  
 . . **truncation errors**  
 errors  
 . **truncation errors**  
 RT ill-conditioned problems (mathematics)  
 precision
- trunks (lines)*  
 USE **transmission lines**
- trunnions*  
 USE **shafts (machine elements)**
- trusses**  
 GS structural members  
 . **trusses**  
 RT arches  
 beams (supports)
- construction industry  
 frames  
 girders  
 I beams  
 Integrated Truss Structure P1  
 Integrated Truss Structure S1  
 Integrated Truss Structure Z1  
 loops  
 Maxwell-Mohr method  
 megamechanics  
 $\infty$  structures  
 struts  
 supports  
 Timoshenko beams
- trypanosome**  
 GS animals  
 . protozoa  
 . . Flagellata  
 . . . **trypanosome**  
 microorganisms  
 . protozoa  
 . . Flagellata  
 . . . **trypanosome**  
 parasites  
 . **trypanosome**  
 RT parasitic diseases
- trypsin**  
 GS biopolymers  
 . proteins  
 . . enzymes  
 . . . **trypsin**  
 organic compounds  
 . proteins  
 . . enzymes  
 . . . **trypsin**  
 RT pancreas
- tryptamines**  
 GS organic compounds  
 . amines  
 . . **tryptamines**  
 . . . melatonin  
 . . . serotonin  
 . . . cyclic compounds  
 . . heterocyclic compounds  
 . . . indoles  
 . . . . **tryptamines**  
 . . . . . melatonin  
 . . . . . serotonin
- tryptophan**  
 GS acids  
 . amino acids  
 . . **tryptophan**  
 . carboxylic acids  
 . . **tryptophan**  
 nitrogen compounds  
 . **tryptophan**  
 organic compounds  
 . amino acids  
 . . **tryptophan**  
 . carboxylic acids  
 . . **tryptophan**  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . indoles  
 . . . . **tryptophan**
- TS-11 aircraft**  
 UF *Iskra aircraft*  
*Polish TS-11 aircraft*  
 GS jet aircraft  
 . **TS-11 aircraft**  
 monoplanes  
 . **TS-11 aircraft**  
 training aircraft  
 . **TS-11 aircraft**  
 RT  $\infty$  aircraft
- TSR-2 aircraft**  
 UF *BAC TSR 2 aircraft*  
 attack aircraft  
 GS **TSR-2 aircraft**  
 BAC aircraft  
 . **TSR-2 aircraft**  
 jet aircraft  
 . **TSR-2 aircraft**  
 monoplanes



## tsunami waves

. **TSR-2 aircraft**  
reconnaissance aircraft  
. **TSR-2 aircraft**  
supersonic aircraft  
. **TSR-2 aircraft**  
RT ∞ aircraft

### tsunami waves

DEF A series of waves of extremely long length and period typically caused by a sudden vertical displacement of a large area of the sea floor during an undorsa earthquake.

RT Earth movements  
earthquake damage  
earthquakes  
frontal waves  
seismic waves  
shock waves  
surface waves  
tidal waves  
water waves

### TTL integrated circuits

SN (TRANSISTOR-TRANSISTOR-LOGIC INTEGRATED CIRCUITS)  
UF *transistor-transistor-logic integ circuits*  
GS circuits  
. integrated circuits  
. . **TTL integrated circuits**  
RT electronic packaging  
large scale integration  
microminiaturization  
molecular electronics  
transistor circuits

### TU-104 aircraft

UF *Camel aircraft*  
GS commercial aircraft  
. **TU-104 aircraft**  
jet aircraft  
. **TU-104 aircraft**  
monoplanes  
. **TU-104 aircraft**  
passenger aircraft  
. **TU-104 aircraft**  
Tupolev aircraft  
. **TU-104 aircraft**  
RT ∞ aircraft  
TU-154 aircraft

### TU-124 aircraft

UF *Cookpot aircraft*  
GS commercial aircraft  
. **TU-124 aircraft**  
jet aircraft  
. **TU-124 aircraft**  
monoplanes  
. **TU-124 aircraft**  
passenger aircraft  
. **TU-124 aircraft**  
transport aircraft  
. **TU-124 aircraft**  
Tupolev aircraft  
. **TU-124 aircraft**  
RT ∞ aircraft  
turbofan engines

### TU-134 aircraft

GS commercial aircraft  
. **TU-134 aircraft**  
jet aircraft  
. turbofan aircraft  
. . **TU-134 aircraft**  
monoplanes  
. **TU-134 aircraft**  
passenger aircraft  
. **TU-134 aircraft**  
Tupolev aircraft  
. **TU-134 aircraft**  
RT ∞ aircraft

### TU-144 aircraft

GS commercial aircraft  
. supersonic commercial air transport  
. . **TU-144 aircraft**  
jet aircraft  
. turbofan aircraft  
. . **TU-144 aircraft**  
passenger aircraft  
. **TU-144 aircraft**

supersonic aircraft  
. supersonic transports  
. . supersonic commercial air transport  
. . . **TU-144 aircraft**  
transport aircraft  
. **TU-144 aircraft**  
RT ∞ aircraft

### TU-154 aircraft

GS commercial aircraft  
. **TU-154 aircraft**  
jet aircraft  
. **TU-154 aircraft**  
transport aircraft  
. **TU-154 aircraft**  
Tupolev aircraft  
. **TU-154 aircraft**  
RT ∞ aircraft  
cargo aircraft  
passenger aircraft  
TU-104 aircraft

### TU-204 aircraft

(added September 1994)  
GS commercial aircraft  
. **TU-204 aircraft**  
jet aircraft  
. **TU-204 aircraft**  
passenger aircraft  
. **TU-204 aircraft**  
transport aircraft  
. **TU-204 aircraft**  
Tupolev aircraft  
. **TU-204 aircraft**  
RT ∞ aircraft

### tube anodes

GS electrodes  
. anodes  
. . **tube anodes**  
RT cathodes  
electrode materials  
electron guns

### tube cathodes

GS electrodes  
. cathodes  
. . **tube cathodes**  
. . . cold cathodes  
. . . hot cathodes  
. . . photocathodes  
. . . thermionic cathodes  
. . . tunnel cathodes  
RT cold cathode tubes  
electron guns  
hollow cathodes

### tube grids

GS electrodes  
. **tube grids**  
RT bias  
electron guns  
electron tubes  
∞ grids  
ionizers

### tube heat exchangers

GS heat exchangers  
. **tube heat exchangers**  
RT regenerators

### tube lasers

DEF Stimulated emission devices activated with shock tubes.  
RT chemical lasers  
gasdynamic lasers  
laser outputs  
pulsed lasers  
shock tubes  
waveguide lasers

### tuberculosis

GS diseases  
. infectious diseases  
. . bacterial diseases  
. . . **tuberculosis**  
. respiratory diseases

### . . tuberculosis

### ∞ tubes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT Bourdon tubes  
bronchi  
burettes  
cannulae  
capillary tubes  
circular tubes  
ducts  
electron tubes  
eustachian tubes  
Hilsch tubes  
hoses  
linings  
manifolds  
microwave tubes  
nanotubes  
pipes (tubes)  
pitot tubes  
shock tubes  
siphons  
trachea  
Venturi tubes

### tubing

USE **pipes (tubes)**

### tubular fullerenes

(added September 2001)  
USE **carbon nanotubes**

### Tully-Fisher relation

(added March 2004)  
DEF A correlation for spiral galaxies between their luminosity and rotational velocity that can be used to calculate the distance to the galaxy or associated galactic cluster.  
RT cosmology  
distance  
galactic rotation  
luminosity  
spiral galaxies

### tumbling motion

DEF An attitude situation in which the vehicle continues on its flight, but turns end over end about its center of mass.  
RT attitude stability  
coning motion  
destabilization  
mixers  
∞ motion  
rotating environments  
satellite rotation  
∞ separation  
spacecraft motion  
spacecraft stability

### tumor suppressor genes

(added June 2004)  
DEF Genes that inhibit expression of the tumorigenic phenotype. They are normally involved in holding cellular growth in check. When tumor suppressor genes are inactivated or lost, a barrier to normal proliferation is removed and unregulated growth is possible.  
GS genes  
. **tumor suppressor genes**  
RT cancer  
neoplasms  
tumor suppressor proteins  
tumors

### tumor suppressor proteins

(added June 2004)  
DEF Proteins that are normally involved in holding cellular growth in check. Deficiencies or abnormalities in these proteins may lead to unregulated cell growth and tumor development.  
GS biopolymers  
. proteins  
. . **tumor suppressor proteins**  
organic compounds  
. proteins  
. . **tumor suppressor proteins**  
RT cancer  
neoplasms

tumor suppressor genes  
tumors

**tumors**  
GS diseases  
  . **tumors**  
  . . neoplasms  
  . . . cancer  
  . . . . leukemias  
RT cysts  
occupational diseases  
tumor suppressor genes  
tumor suppressor proteins

**tunable filters**  
(added June 1995)  
DEF Filters consisting generally of combinations of capacitors, inductors, and resistors that have been selected in such a way as to present a relative minimum (maximum) impedance to one or more specific frequencies.  
RT acousto-optics  
adaptive filters  
charge transfer devices  
crystal filters  
electric filters  
electro-optics  
∞ filters  
microwave filters  
optical filters  
radio filters  
tuning

**tunable lasers**  
DEF Stimulated emission devices with selectable frequency output.  
GS stimulated emission devices  
  . lasers  
  . . **tunable lasers**  
RT DBR lasers  
diffraction radiation  
light modulation  
optical communication  
tuning  
wiggler magnets

**tundra**  
DEF A treeless, level or gently undulating plain characteristic of arctic and subarctic regions. It usually has a marshy surface which supports a growth of mosses, lichens, and numerous low shrubs underlain by a dark, mucky soil and permafrost.  
GS land  
  . plains  
  . . **tundra**  
landforms  
  . plains  
  . . **tundra**  
RT Arctic regions  
Asia  
geography  
North America

**turners**  
GS **turners**  
  . waveguide tuners  
RT radio receivers  
resonance probes  
resonant frequencies  
television receivers

**tungstates**  
GS tungsten compounds  
  . **tungstates**  
  . . calcium tungstates  
  . . lead tungstates  
  . . zinc tungstates

**tungsten**  
UF *wolfram*  
GS chemical elements  
  . **tungsten**  
  metals  
  . refractory metals  
  . . **tungsten**  
  . transition metals  
  . . **tungsten**  
  refractory materials  
  . refractory metals

. . **tungsten**

**tungsten alloys**  
GS alloys  
  . heat resistant alloys  
  . . refractory metal alloys  
  . . . **tungsten alloys**  
  refractory materials  
  . refractory metal alloys  
  . . **tungsten alloys**  
RT hafnium alloys  
Stellite (trademark)

**tungsten carbides**  
GS carbon compounds  
  . carbides  
  . . **tungsten carbides**  
  tungsten compounds  
  . **tungsten carbides**

**tungsten chlorides**  
GS halogen compounds  
  . chlorine compounds  
  . . chlorides  
  . . . **tungsten chlorides**  
  . halides  
  . . chlorides  
  . . . **tungsten chlorides**  
  . metal halides  
  . . . tungsten halides  
  . . . . **tungsten chlorides**  
  tungsten compounds  
  . tungsten halides  
  . . **tungsten chlorides**

**tungsten compounds**  
GS **tungsten compounds**  
  . tungstates  
  . . calcium tungstates  
  . . lead tungstates  
  . . zinc tungstates  
  . tungsten carbides  
  . tungsten halides  
  . . tungsten chlorides  
  . . tungsten fluorides  
  . tungsten oxides  
  . . scheelite  
RT ∞ chemical compounds  
∞ Group 6B compounds  
∞ metal compounds

**tungsten fluorides**  
GS halogen compounds  
  . fluorine compounds  
  . . fluorides  
  . . . metal fluorides  
  . . . . **tungsten fluorides**  
  . halides  
  . . fluorides  
  . . . metal fluorides  
  . . . . **tungsten fluorides**  
  . metal halides  
  . . . metal fluorides  
  . . . . **tungsten fluorides**  
  . . tungsten halides  
  . . . . **tungsten fluorides**  
  tungsten compounds  
  . tungsten halides  
  . . **tungsten fluorides**

**tungsten halides**  
GS halogen compounds  
  . halides  
  . . metal halides  
  . . . **tungsten halides**  
  . . . . tungsten chlorides  
  . . . . tungsten fluorides  
  tungsten compounds  
  . **tungsten halides**  
  . . tungsten chlorides  
  . . tungsten fluorides

*tungsten inert gas welding*  
USE **gas tungsten arc welding**

**tungsten isotopes**  
GS chemical elements  
  . nuclides  
  . . isotopes  
  . . . **tungsten isotopes**

metals  
  . refractory metals  
  . . **tungsten isotopes**  
  . transition metals  
  . . . **tungsten isotopes**  
  refractory materials  
  . refractory metals  
  . . **tungsten isotopes**

**tungsten oxides**  
GS chalcogenides  
  . oxides  
  . . metal oxides  
  . . . **tungsten oxides**  
  . . . . scheelite  
  tungsten compounds  
  . **tungsten oxides**  
  . . scheelite

**Tungusk meteorite**  
UF *Tunguska event*  
GS celestial bodies  
  . meteorites  
  . . stony meteorites  
  . . . **Tungusk meteorite**  
RT meteorite collisions  
meteorite craters

*Tunguska event*  
USE **Tungusk meteorite**

**tuning**  
GS **tuning**  
  . Schuler tuning  
RT automatic frequency control  
automatic gain control  
dye lasers  
frequency pulling  
mistuning (turbomachinery)  
Q factors  
resonance  
resonant frequencies  
resonators  
tunable filters  
tunable lasers

**tuning fork gyroscopes**  
GS gyroscopes  
  . **tuning fork gyroscopes**  
RT resonators

**Tunisia**  
GS nations  
  . **Tunisia**  
RT Africa

**tunnel cathodes**  
GS electrodes  
  . cathodes  
  . . tube cathodes  
  . . . **tunnel cathodes**  
RT cold cathode tubes  
cold cathodes  
electron tubes  
hollow cathodes  
∞ tunnels

**tunnel diodes**  
UF *Esaki diodes*  
GS electronic equipment  
  . diodes  
  . . semiconductor diodes  
  . . . **tunnel diodes**  
  . . . . resonant tunneling diodes  
RT electron tunneling  
junction diodes  
MIM diodes  
negative conductance  
negative resistance circuits  
resonant tunneling  
tunnel junctions  
∞ tunnels

**tunnel junctions**  
(added September 1993)  
DEF An electronic device having an extremely thin potential barrier to electron flow, so that the transport characteristic (the current-voltage flow) is primarily governed by the quantum-mechanical tunneling process which

## tunneling

permits electrons to penetrate the barrier.

- RT barrier layers
- electron tunneling
- heterojunctions
- Josephson junctions
- photoconductors
- quantum electronics
- semiconductor devices
- semiconductor junctions
- single electron transistors
- solar cells
- superconducting devices
- tunnel diodes

*tunnel resistors*

- USE **electron tunneling resistors**

## ∞ tunneling

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT electron tunneling
- resonant tunneling
- tunneling (excavation)

## tunneling (excavation)

- GS excavation
- . **tunneling (excavation)**
- RT bedrock
- construction
- drainage
- drilling
- jacks (lifts)
- lining processes
- rocks
- soils
- ∞ tunneling
- underground structures

## ∞ tunnels

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)
- RT gaps
- hydraulic test tunnels
- lunar shelters
- passageways
- streets
- transfer tunnels
- tunnel cathodes
- tunnel diodes
- wind tunnels

## Tupolev aircraft

- GS **Tupolev aircraft**
- . TU-104 aircraft
- . TU-124 aircraft
- . TU-134 aircraft
- . TU-154 aircraft
- . TU-204 aircraft
- RT ∞ aircraft

## turbidity

- GS electromagnetic properties
- . optical properties
- . . **turbidity**
- RT absorbance
- clarity
- haze
- light transmission
- opacity
- optical density
- ∞ properties
- solubility
- transparence

## turbine blades

- DEF The blades of a turbine wheel.
- GS turbomachine blades
- . **turbine blades**
- RT ∞ blades
- compressor blades
- engine parts
- fan blades
- rotor blades (turbomachinery)
- rotor stator interactions
- stator blades

## turbines

### turbine engines

DEF Engines incorporating a turbine as a principal component; especially gas turbine engines.

- GS engines
- . **turbine engines**
- . . gas turbine engines
- . . . hydrogen engines
- . . . jet engines
- . . . T-58 engine
- . . . ramjet engines
- . . . . integral rocket ramjets
- . . . . low volume ramjet engines
- . . . . pulsejet engines
- . . . . supersonic combustion ramjet engines
- . . . . turboramjet engines
- . . . . turbojet engines
- . . . . Bristol-Siddeley Olympus 593 engine
- . . . . Bristol-Siddeley Viper engine
- . . . . ducted fan engines
- . . . . J-33 engine
- . . . . J-34 engine
- . . . . J-47 engine
- . . . . J-52 engine
- . . . . J-57 engine
- . . . . J-58 engine
- . . . . J-65 engine
- . . . . J-69-T-25 engine
- . . . . J-71 engine
- . . . . J-73 engine
- . . . . J-75 engine
- . . . . J-79 engine
- . . . . J-85 engine
- . . . . J-93 engine
- . . . . RA-28 engine
- . . . . turbofan engines
- . . . . . Bristol-Siddeley BS 53 engine
- . . . . . CF-700 engine
- . . . . . convertible fan-shaft engines
- . . . . . J-97 engine
- . . . . . TF-30 engine
- . . . . . TF-34 engine
- . . . . . TF-41 engine
- . . . . . turboprop engines
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine
- . . . . . turboramjet engines
- RT aircraft engines
- automobile engines
- convergent nozzles
- gas bearings
- integral rocket ramjets
- torpedo engines

### turbine exhaust nozzles

- GS exhaust nozzles
- . **turbine exhaust nozzles**
- RT conical nozzles
- convergent-divergent nozzles

### turbine instruments

- RT flowmeters
- ∞ instruments
- turbomachinery

### turbine pumps

- UF *turbopumps*
- GS pumps
- . axial flow pumps
- . . **turbine pumps**
- turbomachinery
- . **turbine pumps**
- RT centrifugal pumps
- fuel pumps
- jet pumps
- preburners
- turbines

## turbocompressors

### turbine wheels

DEF Multivaned wheels or rotors, especially in gas turbine engines, rotated by the impulse from or reaction to a fluid passing across the vanes. Used for rotor disks and turborotors.

- UF *rotor disks*
- turborotors*
- GS rotating bodies
- . rotors
- . . **turbine wheels**
- wheels
- . **turbine wheels**
- RT compressor rotors
- engine parts
- hydraulic equipment
- impellers
- turbines
- turbomachine blades
- water wheels

### turbines

- GS turbomachinery
- . **turbines**
- . . axial flow turbines
- . . gas turbines
- . . shrouded turbines
- . . steam turbines
- . . supersonic turbines
- . . two stage turbines
- . . wind turbines
- . . . tip vanes
- RT engines
- geothermal energy conversion
- geothermal energy extraction
- impellers
- impulse generators
- jet engine fuels
- jet propulsion
- ∞ nozzles
- refractories
- rotating generators
- rotors
- stators
- turbine blades
- turbine pumps
- turbine wheels
- turbogenerators
- turboshafts

*turbochargers*

- USE **superchargers**
- turbocompressors**

### turbocompressors

- UF *axial compressors*
- axial flow compressors*
- multistage compressors*
- turbochargers*
- GS compressors
- . **turbocompressors**
- turbomachinery
- . **turbocompressors**
- RT centrifugal compressors
- centrifugal pumps
- compressor blades
- compressor rotors
- rotating stalls
- rotors
- superchargers
- supersonic compressors
- transonic compressors
- turbine pumps
- turbofans

*turboconverters*

- USE **turbogenerators**

*turboelectric conversion*

- USE **turbogenerators**

### turbofan aircraft

- GS jet aircraft
- . **turbofan aircraft**
- . . A-7 aircraft
- . . BAC 111 aircraft
- . . Boeing 707 aircraft
- . . Boeing 717 aircraft
- . . Boeing 720 aircraft

- .. Boeing 727 aircraft
- .. Boeing 733 aircraft
- .. Boeing 737 aircraft
- .. Boeing 757 aircraft
- .. Boeing 767 aircraft
- .. C-141 aircraft
- .. CL-600 challenger aircraft
- .. Concorde aircraft
- .. CV-990 aircraft
- .. DC 8 aircraft
- .. DH 121 aircraft
- .. DO-31 aircraft
- .. F-5 aircraft
- .. F-28 transport aircraft
- .. F-111 aircraft
- .. IL-62 aircraft
- .. Mystere 20 aircraft
- .. P-1127 aircraft
- .. P-1154 aircraft
- .. Saab 37 aircraft
- .. Saab 105 aircraft
- .. SE-210 aircraft
- .. TU-134 aircraft
- .. TU-144 aircraft

RT  $\infty$  aircraft

- C-135 aircraft
- $\infty$  low wing aircraft
- passenger aircraft
- transport aircraft
- turboprop aircraft

**turbofan engines**

GS engines

- . air breathing engines
- .. gas turbine engines
- ... jet engines
- ... turbojet engines
- ... **turbofan engines**
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- . internal combustion engines
- .. gas turbine engines
- ... jet engines
- ... turbojet engines
- ... **turbofan engines**
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine
- . turbine engines
- .. gas turbine engines
- ... jet engines
- ... turbojet engines
- ... **turbofan engines**
- ..... Bristol-Siddeley BS 53 engine
- ..... CF-700 engine
- ..... convertible fan-shaft engines
- ..... J-97 engine
- ..... TF-30 engine
- ..... TF-34 engine
- ..... TF-41 engine

RT B-52 aircraft

- Boeing 747 aircraft
- Boeing 767 aircraft
- C-5 aircraft
- C-17 aircraft
- C-141 aircraft
- DC 10 aircraft
- ducted fan engines
- L-1011 aircraft
- Mystere 50 aircraft
- P-1127 aircraft
- P-1154 aircraft
- TU-124 aircraft
- turbofans
- turboprop engines

**turbofans**

DEF Turbojet engines in which additional propulsive thrust is gained by extending a por-

tion of the compressor or turbine blades outside the inner engine cases.

GS turbomachinery

. **turbofans**

RT ducted fans

$\infty$  fans

lift fans

turbocompressors

turbofan engines

**turbogenerators**

UF *thermal power*

*turboconverters*

*turboelectric conversion*

GS electric generators

. rotating generators

.. **turbogenerators**

... ASTEC solar turboelectric

generator

turbomachinery

. **turbogenerators**

.. ASTEC solar turboelectric

generator

RT AC generators

$\infty$  conversion

$\infty$  electric power

electrical engineering

gas turbine engines

gas turbines

$\infty$  generators

geothermal energy conversion

geothermal energy extraction

geothermal energy utilization

hydroelectric power stations

hydroelectricity

SNAP

SNAP 1

SNAP 2

SNAP 8

solar generators

space power reactors

space power unit reactors

steam turbines

turbines

wind turbines

*turbojet aircraft*

USE **jet aircraft**

**turbojet engine control**

GS engine control

. **turbojet engine control**

RT aircraft control

automatic control

$\infty$  control

flight control

fuel control

remote control

servocontrol

thrust control

**turbojet engines**

DEF Jet engines incorporating a turbine driven air compressor to take in and compress the air for the combustion of fuel (or for heating by a nuclear reactor), the gases of combustion (or the heated air) being used both to rotate the turbine and create a thrust producing jet.

GS engines

. air breathing engines

.. gas turbine engines

... jet engines

... **turbojet engines**

..... Bristol-Siddeley Olympus 593

engine

..... Bristol-Siddeley Viper engine

..... ducted fan engines

..... J-33 engine

..... J-34 engine

..... J-47 engine

..... J-52 engine

..... J-57 engine

..... J-58 engine

..... J-65 engine

..... J-69-T-25 engine

..... J-71 engine

..... J-73 engine

..... J-75 engine

..... J-79 engine

..... J-85 engine

..... J-93 engine

..... RA-28 engine

..... turbofan engines

..... Bristol-Siddeley BS 53 engine

..... CF-700 engine

..... convertible fan-shaft engines

..... J-97 engine

..... TF-30 engine

..... TF-34 engine

..... TF-41 engine

..... turboprop engines

..... T-34 engine

..... T-38 engine

..... T-53 engine

..... T-55 engine

..... T-56 engine

..... T-63 engine

..... T-64 engine

..... T-74 engine

..... T-76 engine

..... T-78 engine

..... turboramjet engines

. internal combustion engines

.. gas turbine engines

... jet engines

... **turbojet engines**

..... Bristol-Siddeley Olympus 593

engine

..... Bristol-Siddeley Viper engine

..... ducted fan engines

..... J-33 engine

..... J-34 engine

..... J-47 engine

..... J-52 engine

..... J-57 engine

..... J-58 engine

..... J-65 engine

..... J-69-T-25 engine

..... J-71 engine

..... J-73 engine

..... J-75 engine

..... J-79 engine

..... J-85 engine

..... J-93 engine

..... RA-28 engine

..... turbofan engines

..... Bristol-Siddeley BS 53 engine

..... CF-700 engine

..... convertible fan-shaft engines

..... J-97 engine

..... TF-30 engine

..... TF-34 engine

..... TF-41 engine

..... turboprop engines

..... T-34 engine

..... T-38 engine

..... T-53 engine

..... T-55 engine

..... T-56 engine

..... T-63 engine

..... T-64 engine

..... T-74 engine

..... T-76 engine

..... T-78 engine

..... turboramjet engines

. turbine engines

.. gas turbine engines

... jet engines

... **turbojet engines**

..... Bristol-Siddeley Olympus 593

engine

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..... J-52 engine

..... J-57 engine

..... J-58 engine

..... J-65 engine

..... J-69-T-25 engine

..... J-71 engine

..... J-73 engine

..... J-75 engine

..... J-79 engine

..... J-85 engine

..... J-93 engine

..... RA-28 engine

..... turbofan engines

## turbomachine blades

- . . . . . Bristol-Siddeley BS 53 engine
- . . . . . CF-700 engine
- . . . . . convertible fan-shaft engines
- . . . . . J-97 engine
- . . . . . TF-30 engine
- . . . . . TF-34 engine
- . . . . . TF-41 engine
- . . . . . turboprop engines
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine
- . . . . . turboramjet engines

- RT convergent nozzles
- Hound Dog missile
- jet aircraft
- Mace missiles
- quail missile
- ramjet engines
- Regulus missile

## turbomachine blades

- GS **turbomachine blades**
- . compressor blades
- . rotor blades (turbomachinery)
- . stator blades
- . turbine blades

- RT airfoils
- ∞ blades
- ∞ buckets
- cascade flow
- fan blades
- impellers
- mistuning (turbomachinery)
- paddles
- rotors
- turbine wheels
- vanes

## turbomachinery

- GS **turbomachinery**
- . centrifugal compressors
- . centrifugal pumps
- . J-33 engine
- . turbine pumps
- . turbines
- . . axial flow turbines
- . . gas turbines
- . . shrouded turbines
- . . steam turbines
- . . supersonic turbines
- . . two stage turbines
- . . wind turbines
- . . . tip vanes
- . turbocompressors
- . turbofans
- . turbogenerators
- . . ASTEC solar turboelectric generator

- RT blowers
- compressors
- ∞ machinery
- pumps
- rotating generators
- rotor dynamics
- superchargers
- turbine instruments
- wave rotors

## turbopause

- GS Earth atmosphere
- . upper atmosphere
- . . thermosphere
- . . . **turbopause**
- RT atmospheric circulation
- atmospheric physics
- atmospheric turbulence

## turboprop aircraft

- GS jet aircraft
- . **turboprop aircraft**
- . . AN-22 aircraft
- . . AN-24 aircraft
- . . Argosy MK-1 aircraft

- . . ATR-72 aircraft
- . . Breguet 941 aircraft
- . . Breguet 1150 aircraft
- . . C-2 aircraft
- . . C-130 aircraft
- . . C-133 aircraft
- . . C-160 aircraft
- . . CL-44 aircraft
- . . CL-84 aircraft
- . . DHC 5 aircraft
- . . DO-328 aircraft
- . . E-2 aircraft
- . . Electra aircraft
- . . F-27 aircraft
- . . G-222 aircraft
- . . HS-748 aircraft
- . . MH-262 aircraft
- . . OV-1 aircraft
- . . OV-10 aircraft
- . . P-3 aircraft
- . . SC-5 aircraft
- . . Viscount aircraft
- . . YS-11 aircraft

- RT ∞ aircraft
- general aviation aircraft
- ∞ low wing aircraft
- passenger aircraft
- ∞ subsonic aircraft
- transport aircraft
- turbofan aircraft

## turboprop engines

- UF *Dart turboprop engines*
- GS engines
- . air breathing engines
- . . gas turbine engines
- . . . jet engines
- . . . . turbojet engines
- . . . . . **turboprop engines**
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine
- . internal combustion engines
- . . gas turbine engines
- . . . jet engines
- . . . . turbojet engines
- . . . . . **turboprop engines**
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine
- . turbine engines
- . . gas turbine engines
- . . . jet engines
- . . . . turbojet engines
- . . . . . **turboprop engines**
- . . . . . T-34 engine
- . . . . . T-38 engine
- . . . . . T-53 engine
- . . . . . T-55 engine
- . . . . . T-56 engine
- . . . . . T-63 engine
- . . . . . T-64 engine
- . . . . . T-74 engine
- . . . . . T-76 engine
- . . . . . T-78 engine

- RT C-160 aircraft
- contrarotating propellers
- E-2 aircraft
- P-3 aircraft
- prop-fan technology
- turbofan engines

- XC-142 aircraft

## turbopumps

- USE **turbine pumps**

## turboramjet engines

- GS engines
- . air breathing engines
- . . gas turbine engines
- . . . jet engines
- . . . . ramjet engines
- . . . . . **turboramjet engines**
- . . . . . turbojet engines
- . . . . . **turboramjet engines**
- . . internal combustion engines
- . . . gas turbine engines
- . . . . jet engines
- . . . . . ramjet engines
- . . . . . **turboramjet engines**
- . . . . . turbojet engines
- . . . . . **turboramjet engines**
- . . turbine engines
- . . . gas turbine engines
- . . . . jet engines
- . . . . . ramjet engines
- . . . . . **turboramjet engines**
- . . . . . turbojet engines
- . . . . . **turboramjet engines**
- RT ∞ hybrid rocket engines

## turborocket engines

- GS engines
- . rocket engines
- . . **turborocket engines**
- . . . torpedo engines
- . . . . **turborocket engines**
- RT booster rocket engines
- hydrazine engines
- hydrogen oxygen engines
- liquid air cycle engines
- restartable rocket engines
- sustainer rocket engines

## turborotors

- USE **turbine wheels**

## turboshfts

- GS shafts (machine elements)
- . rotating shafts
- . . **turboshfts**
- RT convertible fan-shaft engines
- rotors
- turbines
- wave rotors

## Turbo-Skyvan aircraft

- USE **SC-7 aircraft**

## turbulence

- DEF A state of fluid flow in which the instantaneous velocities exhibit irregular and apparently random fluctuations so that in practice only statistical properties can be recognized and subjected to analysis.

## GS turbulence

- . atmospheric turbulence
- . . clear air turbulence
- . . . gusts
- . . . low level turbulence
- . . homogeneous turbulence
- . . isotropic turbulence
- . . low turbulence
- . . magnetohydrodynamic turbulence
- . . plasma turbulence
- . . . Langmuir turbulence

- RT aerodynamic drag
- atmospheric effects
- backwash
- boundary layer control
- boundary layer transition
- flow characteristics
- fluid dynamics
- gas streams
- micrometeorology
- mixing
- ∞ motion
- nonuniformity
- panel method (fluid dynamics)
- period doubling
- sea roughness

- slipstreams
  - steady flow
  - strange attractors
  - Strouhal number
  - surface noise interactions
  - turbulent boundary layer
  - turbulent flow
  - unsteady flow
  - vertical air currents
  - vortex filaments
  - vortices
  - vorticity
  - wakes
  - wind effects
- turbulence effects**
- RT aerodynamic stability
  - buffeting
  - ∞ effects
  - flutter
  - seeing (astronomy)
  - separated flow
- turbulence meters**
- UF *hot-wire turbulence meters*
  - GS measuring instruments
  - . **turbulence meters**
  - RT hot-wire flowmeters
- turbulence models**  
(added September 1988)
- GS models
    - . mathematical models
    - . . **turbulence models**
    - . . . Baldwin-Lomax turbulence model
    - . . . k-epsilon turbulence model
    - . . . k-omega turbulence model
  - RT computational fluid dynamics
  - flow equations
  - large eddy simulation
  - magnetohydrodynamic simulation
  - mixing length flow theory
  - renormalization group methods
  - Reynolds averaging
  - turbulent boundary layer
  - turbulent combustion
  - turbulent flow
- turbulent boundary layer**
- DEF The layer in which the Reynolds stresses are much larger than the viscous stresses. When the Reynolds number is sufficiently high, there is a turbulent layer adjacent to the laminar boundary layer.
- GS boundary layers
  - . **turbulent boundary layer**
  - RT Baldwin-Lomax turbulence model
  - boundary layer transition
  - compressible boundary layer
  - Ekman layer
  - hypersonic boundary layer
  - incompressible boundary layer
  - k-epsilon turbulence model
  - k-omega turbulence model
  - laminar boundary layer
  - ∞ layers
  - mixing layers (fluids)
  - Reynolds stress
  - riblets
  - supersonic boundary layers
  - thermal boundary layer
  - three dimensional boundary layer
  - turbulence
  - turbulence models
  - two dimensional boundary layer
- turbulent combustion**  
(added September 1992)
- DEF Combustion or combustible flow in which turbulence is superimposed on the main movement of the flame fronts resulting in random, unpredictable fluctuations.
- GS combustion
  - . **turbulent combustion**
  - RT chemical explosions
  - combustible flow
  - combustion physics
  - combustion stability
  - flame propagation
  - flames
- fuel combustion
  - oxidation
  - premixed flames
  - propellant combustion
  - reacting flow
  - turbulence models
  - turbulent flames
  - turbulent flow
- turbulent diffusion**
- UF *eddy diffusion*
  - GS diffusion
  - . **turbulent diffusion**
  - RT atmospheric diffusion
  - atmospheric turbulence
  - clear air turbulence
  - counterflow
- turbulent flames**  
(added June 1997)
- GS flames
  - . **turbulent flames**
  - RT combustible flow
  - flame propagation
  - flame stability
  - premixed flames
  - turbulent combustion
  - turbulent flow
- turbulent flow**
- DEF Fluid motion in which random motions of parts of the fluid are superimposed upon a simple pattern of flow. All or nearly all fluid flow displays some degree of turbulence. The opposite is laminar flow.
- GS fluid flow
  - . **turbulent flow**
  - . . cavitation flow
  - . . . supercavitating flow
  - RT aerodynamic interference
  - aerodynamics
  - annular flow
  - atmospheric turbulence
  - Baldwin-Lomax turbulence model
  - Blasius flow
  - boundary layer transition
  - closure law
  - combustible flow
  - counterflow
  - critical flow
  - direct numerical simulation
  - eddy viscosity
  - flow characteristics
  - flow stability
  - fluid amplifiers
  - free convection
  - gas flow
  - gust alleviators
  - inviscid flow
  - isotropic turbulence
  - k-epsilon turbulence model
  - Kolmogorov theory
  - k-omega turbulence model
  - Lagrange similarity hypothesis
  - laminar flow
  - large eddy simulation
  - liquid flow
  - mass flow
  - mixing length flow theory
  - multiphase flow
  - nonuniform flow
  - open channel flow
  - orifice flow
  - particle laden jets
  - period doubling
  - pipe flow
  - pressure oscillations
  - reacting flow
  - recirculative fluid flow
  - Reynolds number
  - Reynolds stress
  - rotating fluids
  - single-phase flow
  - steady flow
  - steam flow
  - subcritical flow
  - supercritical flow
  - Tollmien-Schlichting waves
  - ∞ transition layers
  - turbulence
- turbulence models
  - turbulent combustion
  - turbulent flames
  - two phase flow
  - uniform flow
  - viscous drag
  - viscous flow
  - vortex avoidance
  - vortex breakdown
  - vortices
  - vorticity transport hypothesis
- turbulent heat transfer**
- GS transmission
  - . heat transmission
  - . . heat transfer
  - . . . **turbulent heat transfer**
  - RT aerodynamic heat transfer
  - convective heat transfer
  - laminar heat transfer
  - thermohydraulics
- turbulent jets**
- RT fluid amplifiers
  - jet streams (meteorology)
  - ∞ jets
- turbulent mixing**
- GS mixing
  - . **turbulent mixing**
  - RT agitation
  - laminar mixing
  - mixing layers (fluids)
  - mixing length flow theory
  - recirculative fluid flow
  - trapped vortices
  - vortices
- turbulent wakes**
- UF *swirling wakes*
  - GS wakes
  - . **turbulent wakes**
  - . . slipstreams
  - . . . propeller slipstreams
  - RT aircraft wakes
  - laminar wakes
  - trapped vortices
  - vortex advisory system
  - vortex sheets
  - vortex streets
- Turing machines**
- DEF Mathematical models of devices that change their internal states and read from, write on, and move potentially infinite tapes, all in accordance with their present states, thereby constituting models for computerlike behavior. Invented in the 1930s, they are named after their inventor, A.M. Turing. Used for finite-state machines.
- UF *finite-state machines*
  - RT automata theory
  - cellular automata
  - digital computers
  - ∞ machinery
  - mathematical logic
  - quantum computation
  - self organizing systems
- Turkey**
- GS nations
  - . **Turkey**
  - RT Black Sea
  - Europe
  - Turkish space program
- turkeys**
- GS animals
  - . vertebrates
  - . . birds
  - . . . **turkeys**
  - RT livestock
- Turkish space program**  
(added August 1990)
- GS programs
  - . space programs
  - . . European space programs
  - . . . **Turkish space program**

## Turkmenistan

RT Turkey

### Turkmenistan

(added August 1993)

GS nations

. Turkmenistan

RT Asia

### turnaround (STS)

DEF The intervals between flights of the shuttle orbiters.

RT downtime

flight time

launch dates

schedules

sequencing

spacecraft maintenance

testing time

### turning flight

UF *banking flight*

GS **turning flight**

. minor circle turning flight

RT aerodynamic balance

aircraft maneuvers

aircraft stability

climbing flight

∞ flight

flight paths

horizontal flight

lateral oscillation

lateral stability

maneuvers

momentum

roll

yaw

### turnstile antennas

DEF Antennas composed of two dipole antennas, normal to each other, with their axes intersecting at their midpoints. Usually, the currents are equal and in phase quadrature.

GS antennas

. omnidirectional antennas

. . turnstile antennas

arrays

. antenna arrays

. . turnstile antennas

RT dipole antennas

∞ grids

wire grid lenses

### turpentine

GS solvents

. turpentine

terpenes

. turpentine

RT paints

∞ turret

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)

RT gun turrets

turret lathes

### turret lathes

GS tools

. machine tools

. . lathes

. . . turret lathes

RT ∞ turret

### turtles

GS animals

. vertebrates

. . reptiles

. . . turtles

### Tutor aircraft

USE CL-41 aircraft

### TVC (control)

USE thrust vector control

### TVD schemes

(added August 1989)

UF *total variation diminishing schemes*

GS analysis (mathematics)

. numerical analysis

. . approximation

. . . TVD schemes

RT computational fluid dynamics

essentially non-oscillatory schemes

finite difference theory

finite volume method

### twenty-four hour orbits

GS orbits

. Earth orbits

. . **twenty-four hour orbits**

. spacecraft orbits

. . satellite orbits

RT

circular orbits

equatorial orbits

geosynchronous orbits

orbital mechanics

PAS

planetary orbits

polar orbits

stationary orbits

Synchronous Communications

Satellite Proj

synchronous satellites

### twenty-seven day variation

GS variations

. **twenty-seven day variation**

RT

solar cycles

solar rotation

starspots

sunspots

### twilight glow

GS atmospheric radiation

. sky radiation

. . airglow

. . . **twilight glow**

electromagnetic radiation

. light (visible radiation)

. . sky radiation

. . . airglow

. . . . **twilight glow**

RT

dayglow

night

night sky

### twinning

GS **twinning**

. mechanical twinning

RT

crystal defects

crystal growth

crystal structure

grain boundaries

stacking fault energy

### twisted wings

GS airfoils

. wings

. . **twisted wings**

RT

cambered wings

fixed wings

flexible wings

ring wings

uncambered wings

### twisting

UF *pretwisting*

RT

bending

buckling

deformation

distortion

kinking

structural strain

torque

torsion

torsional vibration

warping

winding

### twitching

RT involuntary actions

muscles

muscular function

### two body orbits

USE **two body problem**

### two body problem

DEF That problem in classical celestial me-

chanics which treats of the relative motion of two point masses under their mutual gravitational attraction. Used for two body orbits.

UF *two body orbits*

RT binary stars

celestial mechanics

Earth-Moon system

Hylleraas coordinates

many body problem

orbital mechanics

orbits

perturbation

∞ problems

Roche limit

three body problem

### two dimensional bodies

RT ∞ bodies

∞ cross sections

ducted bodies

mathematical models

∞ surfaces

### two dimensional boundary layer

GS boundary layers

. **two dimensional boundary layer**

RT

laminar boundary layer

supersonic boundary layers

turbulent boundary layer

### two dimensional flow

GS fluid flow

. **two dimensional flow**

. . Couette flow

. . Ringleb flow

RT

axial flow

Blasius flow

capillary waves

coaxial flow

flow geometry

Hartmann flow

one dimensional flow

Prandtl-Meyer expansion

radial flow

Rayleigh waves

steady flow

stream functions (fluids)

Taylor instability

three dimensional flow

wall flow

wedge flow

### two dimensional jets

RT jet flow

jet mixing flow

∞ jets

wall flow

### two dimensional models

(added August 1988)

GS models

. **two dimensional models**

RT

computerized simulation

mathematical models

three dimensional models

### two fluid models

RT Boltzmann distribution

liquid helium

magnetohydrodynamic flow

mixing layers (fluids)

rotating plasmas

shock wave propagation

superfluidity

### two phase flow

GS fluid flow

. multiphase flow

. . **two phase flow**

RT

gas flow

laminar flow

liquid flow

particle image velocimetry

∞ pressure drop

single-phase flow

solids flow

turbulent flow

*two phase systems*  
 USE **binary systems (materials)**

*two photon coherent states*  
 USE **squeezed states (quantum theory)**

**two reflector antennas**  
 GS antennas  
 . directional antennas  
 . . reflector antennas  
 . . . **two reflector antennas**

RT Cassegrain antennas  
 radio antennas  
 reflectometers  
 reflectors

**two stage plasma engines**  
 GS engines  
 . rocket engines  
 . . electric rocket engines  
 . . . plasma engines  
 . . . . **two stage plasma engines**

RT electric propulsion  
 plasmas (physics)

**two stage turbines**  
 GS turbomachinery  
 . turbines  
 . . **two stage turbines**

RT gas turbine engines  
 gas turbines  
 steam turbines

**two-wavelength lasers**  
 GS stimulated emission devices  
 . lasers  
 . . **two-wavelength lasers**

RT coherent light  
 dye lasers  
 laser outputs  
 masers  
 molecular oscillators  
 quantum amplifiers  
 stimulated emission

*TX-33-39 engine*  
 USE **XM-33 engine**

**TX-77 engine**  
 GS engines  
 . rocket engines  
 . . solid propellant rocket engines  
 . . . **TX-77 engine**

RT Lance missile

**TX-354 engine**  
 UF *Castor 2 engine*

GS engines  
 . rocket engines  
 . . solid propellant rocket engines  
 . . . **TX-354 engine**

RT booster rocket engines  
 Little Joe 2 launch vehicle  
 RAM B launch vehicle  
 Scout launch vehicle  
 sustainer rocket engines  
 Trailblazer 2 reentry vehicle  
 XM-33 engine

**Tycho crater**  
 GS craters  
 . lunar craters  
 . . **Tycho crater**

RT meteorite craters

**type 2 bursts**  
 GS bursts  
 . radio bursts  
 . . solar radio bursts  
 . . . **type 2 bursts**  
 electromagnetic radiation  
 . radio waves  
 . . extraterrestrial radio waves  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 2 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 2 bursts**

. . . radio emission  
 . . . . radio bursts  
 . . . . . solar radio bursts  
 . . . . . **type 2 bursts**  
 . . . . solar radio emission  
 . . . . . solar radio bursts  
 . . . . . **type 2 bursts**  
 emission  
 . radio emission  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 2 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 2 bursts**  
 extraterrestrial radiation  
 . extraterrestrial radio waves  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 2 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 2 bursts**  
 solar radiation  
 . . solar radio emission  
 . . . solar radio bursts  
 . . . . **type 2 bursts**

**type 3 bursts**  
 GS bursts  
 . radio bursts  
 . . solar radio bursts  
 . . . **type 3 bursts**  
 electromagnetic radiation  
 . radio waves  
 . . extraterrestrial radio waves  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 . . radio emission  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 emission  
 . radio emission  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 3 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 extraterrestrial radiation  
 . extraterrestrial radio waves  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 3 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 3 bursts**  
 solar radiation  
 . . solar radio emission  
 . . . solar radio bursts  
 . . . . **type 3 bursts**

**type 4 bursts**  
 GS bursts  
 . radio bursts  
 . . solar radio bursts  
 . . . **type 4 bursts**  
 electromagnetic radiation  
 . radio waves  
 . . extraterrestrial radio waves  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 . . radio emission  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 . . . solar radio emission

. . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 emission  
 . radio emission  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 4 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 extraterrestrial radiation  
 . extraterrestrial radio waves  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 4 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 4 bursts**  
 solar radiation  
 . . solar radio emission  
 . . . solar radio bursts  
 . . . . **type 4 bursts**

**type 5 bursts**  
 GS bursts  
 . radio bursts  
 . . solar radio bursts  
 . . . **type 5 bursts**  
 electromagnetic radiation  
 . radio waves  
 . . extraterrestrial radio waves  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 . . radio emission  
 . . . radio bursts  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 emission  
 . radio emission  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 5 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 extraterrestrial radiation  
 . extraterrestrial radio waves  
 . . radio bursts  
 . . . solar radio bursts  
 . . . . **type 5 bursts**  
 . . . solar radio emission  
 . . . . solar radio bursts  
 . . . . . **type 5 bursts**  
 solar radiation  
 . . solar radio emission  
 . . . solar radio bursts  
 . . . . **type 5 bursts**

**typewriters**  
 GS **typewriters**  
 . automatic typewriters  
 . teletypewriters  
 . . teleprinters

RT printers

**typhoid**  
 GS diseases  
 . infectious diseases  
 . . bacterial diseases  
 . . . **typhoid**

**Typhon weapon system**  
 GS weapon systems  
 . **Typhon weapon system**

RT Bumblebee project  
 ∞ systems

**typhoons**  
 GS storms  
 . storms (meteorology)  
 . . cyclones  
 . . . **typhoons**  
 . . . tropical storms



## typhus

RT . . . **typhoons**  
atmospheric circulation  
hurricanes  
marine meteorology  
meteorology  
storm damage  
tornadoes

**typhus**  
GS diseases

. infectious diseases  
. . . bacterial diseases  
. . . **typhus**

**tyrosine**  
GS acids  
. amino acids  
. . **tyrosine**

organic compounds  
. amino acids  
. . **tyrosine**  
RT enzyme activity  
liver

# U

## U bends

- GS pipes (tubes)
  - . **U bends**
- RT fittings

## U spin space

- GS algebra
  - . vector spaces
  - . . **U spin space**
- RT matrices (mathematics)
  - quantum mechanics

## U tubes

- USE **manometers**

## U-2 aircraft

- UF *ER-2 aircraft*
  - Lockheed U-2 aircraft*
  - WU-2 aircraft*
- GS jet aircraft
  - . **U-2 aircraft**
  - Lockheed aircraft
    - . **U-2 aircraft**
    - monoplanes
      - . **U-2 aircraft**
    - reconnaissance aircraft
      - . **U-2 aircraft**
    - research vehicles
      - . research aircraft
        - . . **U-2 aircraft**
    - utility aircraft
      - . **U-2 aircraft**
  - RT  $\infty$  aircraft

## U-10 aircraft

- UF *Courier aircraft*
  - L-28 aircraft*
- GS Helio aircraft
  - . **U-10 aircraft**
  - light aircraft
    - . **U-10 aircraft**
  - monoplanes
    - . **U-10 aircraft**
  - passenger aircraft
    - . **U-10 aircraft**
  - utility aircraft
    - . **U-10 aircraft**
  - V/STOL aircraft
    - . short takeoff aircraft
      - . . **U-10 aircraft**
  - RT  $\infty$  aircraft

## U.S.S.R.

- UF *Soviet Union*
- GS nations
  - . **U.S.S.R.**
- RT Asia
  - Barents Sea
  - Black Sea
  - Caucasus Mountains (U.S.S.R.)
  - Europe
  - Kurile Islands
  - Moscow
  - Sea of Okhotsk
  - Siberia

## U.S.S.R. space program

- GS programs
  - . space programs
  - . . **U.S.S.R. space program**
- RT Apollo Soyuz test project
  - Automatic Universal Orbiting Stations
  - Buran space shuttle
  - GLONASS
  - international cooperation
  - international relations
  - International Satellite Geodesy Experiment
  - lunar retroreflectors
  - Lunik 19 lunar probe
  - Lunik 22 lunar probe
  - Lunik lunar probes
  - Lunokhod lunar roving vehicles
  - Mars 1 spacecraft
  - Mars 2 spacecraft
  - Mars 3 spacecraft
  - Mars 4 Spacecraft
  - Mars 5 spacecraft
  - Mars 6 spacecraft

- Mars 7 spacecraft
- Mir space station
- Molniya satellites
- Proton satellites
- Russian Space Program
- Salyut space station
- Soyuz spacecraft
- Vega project
- Venera 8 satellite
- Venera 10 satellite
- Venera 11 satellite
- Venera 12 satellite
- Venera satellites

## UARS (satellite)

- USE **Upper Atmosphere Research Satellite (UARS)**

## UAS

- (added August 2007)
- USE **unmanned aircraft systems**

## UBV spectra

- GS spectra
  - . radiation spectra
  - . . electromagnetic spectra
  - . . . **UBV spectra**
- RT color-color diagram

## Udimet alloys

- GS alloys
  - . heat resistant alloys
  - . . **Udimet alloys**
  - . nickel alloys
  - . . **Udimet alloys**

## UFO

- USE **unidentified flying objects**

## Uganda

- GS nations
  - . **Uganda**
- RT Africa

## UGV (vehicles)

- (added July 2002)
- USE **unmanned ground vehicles**

## UH-1 helicopter

- UF *HU-1 helicopter*
  - Iroquois helicopter*
  - RH-2 helicopter*
  - YHU-1 helicopter*
  - YUH-1 helicopter*
- GS Bell aircraft
  - . **UH-1 helicopter**
  - utility aircraft
    - . **UH-1 helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **UH-1 helicopter**
  - RT UH-60A helicopter
    - UH-61A helicopter

## UH-2 helicopter

- UF *HU2K-1 helicopter*
  - Kaman UH-2A helicopter*
  - Seasprite helicopter*
- GS Kaman aircraft
  - . **UH-2 helicopter**
  - utility aircraft
    - . **UH-2 helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **UH-2 helicopter**

## UH-12 helicopter

- USE **OH-23 helicopter**

## UH-13 helicopter

- USE **OH-13 helicopter**

## UH-34 helicopter

- UF *HUS-1 helicopter*
  - Seahorse helicopter*

- GS Sikorsky aircraft
  - . **UH-34 helicopter**
  - transport aircraft
    - . **UH-34 helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **UH-34 helicopter**
  - RT S-58 helicopter

## UH-60A helicopter

- UF *YUH-60A helicopter*
- GS Sikorsky aircraft
  - . **UH-60A helicopter**
  - transport aircraft
    - . **UH-60A helicopter**
  - utility aircraft
    - . **UH-60A helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **UH-60A helicopter**
  - RT helicopter design
    - UH-1 helicopter

## UH-61A helicopter

- UF *YUH-61A helicopter*
- GS Sikorsky aircraft
  - . **UH-61A helicopter**
  - transport aircraft
    - . **UH-61A helicopter**
  - utility aircraft
    - . **UH-61A helicopter**
  - V/STOL aircraft
    - . rotary wing aircraft
    - . . helicopters
    - . . . military helicopters
    - . . . . **UH-61A helicopter**
  - RT helicopter design
    - UH-1 helicopter

## UHTREX (nuclear reactors)

- USE **high temperature nuclear reactors**

## Uhuru satellite

- UF *Explorer 42 satellite*
- GS artificial satellites
  - . scientific satellites
  - . . Explorer satellites
  - . . . **Uhuru satellite**
- RT galactic radiation
  - SAS
  - satellite observation
  - x ray astronomy
  - x ray stars

## UK 4 satellite

- GS artificial satellites
  - . scientific satellites
  - . . UK satellites
  - . . . **UK 4 satellite**

## UK satellites

- UF *United Kingdom satellites*
- GS artificial satellites
  - . scientific satellites
  - . . **UK satellites**
  - . . . Ariel 4 satellite
  - . . . Ariel 5 satellite
  - . . . Miranda satellite
  - . . . UK 4 satellite
- RT Infrared Astronomy Satellite
  - Skynet satellites
  - UK space program

## UK space program

- GS programs
  - . space programs
  - . . European space programs
  - . . . **UK space program**
- RT HOTOL launch vehicle
  - UK satellites
  - United Kingdom

## Ukraine

- (added August 1993)
- GS nations

## Ukrainian space program

- . **Ukraine**
- RT Europe
  - Ukrainian space program
- Ukrainian space program**
  - (added January 1999)
  - GS programs
    - . space programs
    - . . **Ukrainian space program**
  - RT Ukraine
    - Zenit launch vehicles
- ulcers**
- GS diseases
  - . **ulcers**
- RT cancer
- ullage**
- DEF The amount that a container, such as a fuel tank, lacks of being full.
- RT fuel tank pressurization
  - fuel tanks
  - interface stability
  - liquid sloshing
  - propellant tanks
  - splashing
  - tank geometry
  - ullage rocket engines
- ullage rocket engines**
- GS engines
  - . rocket engines
  - . . **ullage rocket engines**
  - . torpedo engines
  - . . **ullage rocket engines**
- RT solid propellant rocket engines
  - ullage
- ULM (light modulation)*
- USE **ultrasonic light modulation**
- ulna**
- GS anatomy
  - . musculoskeletal system
  - . . bones
  - . . . **ulna**
- RT arm (anatomy)
  - elbow (anatomy)
- ultra short wave radio equipment*
- USE **very high frequency radio equipment**
- ultracapacitors*
  - (added September 2003)
  - USE **electrochemical capacitors**
- ultrahigh frequencies**
- SN (300 TO 3000 MHZ)
- UF *L band*
  - S band*
- GS frequencies
  - . radio frequencies
  - . . **ultrahigh frequencies**
  - . . . P band
- RT decimeter waves
  - EISCAT radar system (Europe)
  - Fleet Satellite Communication System
  - low frequencies
  - passive L-band radiometers
  - praetersonic devices
  - unified S band
  - very high frequency radio equipment
- ultrahigh vacuum**
- GS pressure
  - . vacuum
  - . . **ultrahigh vacuum**
- RT high vacuum
  - low density research
  - residual gas
  - vacuum apparatus
  - vacuum tests
- ultralight aircraft**
- DEF An aircraft for one person weighing less than 254 pounds with a top speed of 55 knots and a maximum stalling speed of 24 knots.
- RT ∞ aircraft
  - hang gliders
- light aircraft
- man powered aircraft
- ∞ winged vehicles
- ultralow frequencies*
- USE **extremely low frequencies**
- ultralow temperature*
- USE **cryogenic temperature**
- ultrapure metals**
- GS metals
  - . **ultrapure metals**
- RT crystal lattices
  - impurities
  - purification
  - purity
  - single crystals
  - space processing
  - vapor deposition
  - zone melting
- ultrashort pulsed lasers**
- GS stimulated emission devices
  - . lasers
  - . . pulsed lasers
  - . . . **ultrashort pulsed lasers**
- RT glass lasers
  - laser applications
  - light amplifiers
  - pulse duration
  - quantum amplifiers
  - stimulated emission
- ultrasonic agitation**
- GS agitation
  - . **ultrasonic agitation**
- RT ultrasonics
- ultrasonic cleaning**
- GS cleaning
  - . **ultrasonic cleaning**
- RT acoustics
  - cavitation flow
  - cleaners
  - etching
  - fluid flow
  - grinding machines
  - machine tools
  - piezoelectric transducers
  - polishing
  - tools
  - transducers
  - ultrasonic processing
  - ultrasonics
- ultrasonic densimeters**
- DEF Density measuring instruments utilizing ultrasonic devices (sensors).
- GS measuring instruments
  - . densimeters
  - . . **ultrasonic densimeters**
- RT density (mass/volume)
  - density measurement
  - ∞ instruments
  - ∞ measurement
- ultrasonic flaw detection**
- GS detection
  - . **ultrasonic flaw detection**
- RT acoustic imaging
  - ∞ detectors
  - examination
  - identifying
  - inspection
  - nondestructive tests
  - quality control
  - ultrasonic scanners
- ultrasonic grinding machines*
- USE **ultrasonic machining**
- ultrasonic light modulation**
- UF *ULM (light modulation)*
- GS modulation
  - . light modulation
  - . . **ultrasonic light modulation**
- RT Bragg cells
- ultrasonics
- ultrasonic machining**
- UF *ultrasonic grinding machines*
- GS machining
  - . **ultrasonic machining**
- RT ultrasonics
- ultrasonic processing**
  - (added June 1998)
  - DEF The use of ultrasonic radiation to synthesize a compound or material, or alter the structure, properties, or form of a material.
  - UF *sonochemistry*
    - ultrasonic treatment*
  - RT ∞ processing
    - ultrasonic cleaning
    - ultrasonics
- ultrasonic radiation**
- UF *ultrasonic waves*
- GS elastic waves
  - . **ultrasonic radiation**
- RT acoustic frequencies
  - coherent acoustic radiation
  - magnetoelastic waves
  - ∞ radiation
    - sound waves
    - ultrasonics
    - underwater acoustics
- ultrasonic scanners**
- GS scanners
  - . **ultrasonic scanners**
- RT acoustics
  - imaging techniques
  - measuring instruments
  - scanning
  - ultrasonic flaw detection
  - ultrasonics
- ultrasonic soldering**
- UF *sonic soldering*
- GS soldering
  - . **ultrasonic soldering**
- RT brazing
  - ∞ joining
    - ultrasonic welding
    - ultrasonics
- ultrasonic spectroscopy**
- GS spectroscopy
  - . **ultrasonic spectroscopy**
- RT cracks
  - nondestructive tests
  - spectrum analysis
- ultrasonic tests**
- RT acoustic measurement
  - acoustic sounding
  - dynamic modulus of elasticity
  - Lamb waves
  - ∞ materials tests
  - nondestructive tests
  - SH waves
  - ∞ tests
    - ultrasonics
- ultrasonic treatment*
  - (added June 1998)
  - USE **ultrasonic processing**
- ultrasonic wave transducers**
- GS transducers
  - . **ultrasonic wave transducers**
- RT electroacoustics
  - electronic transducers
  - microphones
  - piezoelectric actuators
  - piezoelectric motors
  - pressure sensors
  - sonar
  - surface acoustic wave devices
  - ultrasonics
  - underwater acoustics
- ultrasonic waves*
- USE **ultrasonic radiation**
- ultrasonic welding**
- GS welding

- . pressure welding
- . . **ultrasonic welding**
- RT spot welds
- ultrasonic soldering
- ultrasonics
- ultrasonics**
- DEF The technology of sound at frequencies above the audio frequency range.
- RT acoustics
- electroacoustics
- ultrasonic agitation
- ultrasonic cleaning
- ultrasonic light modulation
- ultrasonic machining
- ultrasonic processing
- ultrasonic radiation
- ultrasonic scanners
- ultrasonic soldering
- ultrasonic tests
- ultrasonic wave transducers
- ultrasonic welding
- ultraviolet absorption**
- GS energy absorption
- . radiation absorption
- . . electromagnetic absorption
- . . . **ultraviolet absorption**
- RT  $\infty$  absorption
- ultraviolet detectors
- ultraviolet astronomy**
- DEF Use of special optical instruments for the observation of astronomical phenomena in the ultraviolet spectrum.
- GS astronomy
- . **ultraviolet astronomy**
- RT electromagnetic radiation
- Extreme Ultraviolet Explorer satellite
- Hubble Space Telescope
- Lyman alpha radiation
- Lyman beta radiation
- Spartan satellites
- Starsat telescope
- telescopes
- ultraviolet telescopes
- ultraviolet detectors**
- GS measuring instruments
- . radiation measuring instruments
- . . actinometers
- . . . **ultraviolet detectors**
- . . . . ultraviolet spectrometers
- . . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . . . ultraviolet spectrophotometers
- RT  $\infty$  detectors
- photometers
- radiometers
- ultraviolet absorption
- ultraviolet radiation
- ultraviolet spectra
- x ray detectors
- ultraviolet emission**
- (added August 1991)
- GS electromagnetic radiation
- . ultraviolet radiation
- . . **ultraviolet emission**
- emission
- . **ultraviolet emission**
- RT emission spectra
- spectral emission
- ultraviolet spectra
- ultraviolet filters**
- GS electromagnetic wave filters
- . optical filters
- . . **ultraviolet filters**
- RT bandpass filters
- electric filters
- infrared filters
- ultraviolet imagery**
- (added January 1997)
- GS imagery
- . **ultraviolet imagery**
- . . ultraviolet photography
- RT ultraviolet photometry
- ultraviolet telescopes
- ultraviolet lasers**
- UF *UV lasers*
- GS stimulated emission devices
- . lasers
- . . gas lasers
- . . . **ultraviolet lasers**
- . . . pulsed lasers
- . . . . **ultraviolet lasers**
- RT coherent light
- laser outputs
- light amplifiers
- light transmission
- masers
- molecular oscillators
- nitrogen lasers
- quantum amplifiers
- stimulated emission
- xenon chloride lasers
- ultraviolet light*
- USE **ultraviolet radiation**
- ultraviolet lithography*
- USE **lithography**
- ultraviolet microscopy**
- GS microscopy
- . **ultraviolet microscopy**
- RT microscopes
- ultraviolet photography**
- GS imagery
- . photography
- . . **ultraviolet photography**
- . . ultraviolet imagery
- . . . **ultraviolet photography**
- RT aerial photography
- cameras
- color photography
- faint object camera
- infrared photography
- radar photography
- ultraviolet photometry**
- GS imagery
- . photography
- . . **ultraviolet photometry**
- optical measurement
- . photometry
- . . **ultraviolet photometry**
- RT black and white photography
- ultraviolet imagery
- ultraviolet radiation**
- DEF Electromagnetic radiation of shorter wavelength than visible radiation; roughly, radiation in the wavelength interval from 100 to 4000 angstroms. Used for ultraviolet light.
- UF *ultraviolet light*
- GS electromagnetic radiation
- . **ultraviolet radiation**
- . . extreme ultraviolet radiation
- . . far ultraviolet radiation
- . . . Lyman alpha radiation
- . . . Lyman beta radiation
- . . near ultraviolet radiation
- . . ultraviolet emission
- RT beams (radiation)
- black body radiation
- Cerenkov radiation
- coherent electromagnetic radiation
- coronal holes
- dayglow
- IUE
- microchannels
- monochromatic radiation
- polarized electromagnetic radiation
- $\infty$  radiation
- Seyfert galaxies
- solar radiation
- sterilization
- sunlight
- thermal radiation
- ultraviolet detectors
- Umkehr effect
- ultraviolet reflection**
- GS reflection
- . **ultraviolet reflection**
- RT infrared reflection
- radio echoes
- reflectometers
- spread reflection
- ultraviolet spectra**
- GS spectra
- . radiation spectra
- . . electromagnetic spectra
- . . . **ultraviolet spectra**
- RT absorption spectra
- emission spectra
- Herzberg bands
- high dispersion spectrographs
- light (visible radiation)
- line spectra
- Lyman spectra
- molecular spectra
- radio spectroscopy
- solar spectra
- stellar spectra
- ultraviolet detectors
- ultraviolet emission
- ultraviolet spectrographs*
- USE **ultraviolet spectrometers**
- ultraviolet spectrometers**
- UF *ultraviolet spectrographs*
- GS measuring instruments
- . optical measuring instruments
- . . photometers
- . . . **ultraviolet spectrometers**
- . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . radiation measuring instruments
- . . actinometers
- . . . ultraviolet detectors
- . . . . **ultraviolet spectrometers**
- . . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . photometers
- . . . **ultraviolet spectrometers**
- . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . photometers
- . . . **ultraviolet spectrometers**
- . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- . . spectrometers
- . . **ultraviolet spectrometers**
- . . . high dispersion spectrographs
- . . . Total Ozone Mapping Spectrometer
- optical equipment
- . optical measuring instruments
- . . photometers
- . . . **ultraviolet spectrometers**
- . . . . high dispersion spectrographs
- . . . . . Total Ozone Mapping Spectrometer
- RT Ebert spectrometers
- Solar Maximum Mission
- solar spectrometers
- ultraviolet spectrophotometers**
- GS measuring instruments
- . optical measuring instruments
- . . photometers
- . . . **ultraviolet spectrophotometers**
- . . . spectrophotometers
- . . . . **ultraviolet spectrophotometers**
- . . . . radiation measuring instruments
- . . . . actinometers
- . . . . spectrophotometers
- . . . . . **ultraviolet spectrophotometers**
- . . . . . ultraviolet detectors
- . . . . . **ultraviolet spectrophotometers**
- . . . . . photometers
- . . . . **ultraviolet spectrophotometers**
- optical equipment
- . optical measuring instruments
- . . photometers
- . . . **ultraviolet spectrophotometers**
- . . . spectrophotometers

# ultraviolet spectroscopy

. . . ultraviolet spectrophotometers

## ultraviolet spectroscopy

- GS spectroscopy
- . **ultraviolet spectroscopy**
- RT absorption spectroscopy
- astronomical spectroscopy
- molecular spectroscopy
- optogalvanic spectroscopy
- radio spectroscopy
- spectroscopic analysis
- spectrum analysis
- vacuum spectroscopy
- x ray spectroscopy

## ultraviolet telescopes

DEF Optical telescopes designed to collect ultraviolet light (wavelengths not capable of passing through Earth's atmosphere) and as such must be used in space.

- GS telescopes
- . **ultraviolet telescopes**
- . . Starlab
- RT far ultraviolet radiation
- spaceborne astronomy
- Swift observatory
- ultraviolet astronomy
- ultraviolet imagery
- x ray astronomy

## Ulysses mission

DEF A proposed ESA/NASA mission using the STS for orbital launching of two spin-stabilized spacecraft equipped with instruments for solar and astrophysical observations. Used for International Solar Polar Mission.

- UF *International Solar Polar Mission*
- GS space missions
- . **Ulysses mission**
- RT Inertial Upper Stage
- mission planning
- ∞ missions
- Solar Maximum Mission
- solar probes
- sun

## umbilical connectors

- GS connectors
- . **umbilical connectors**
- RT bundles
- extravehicular activity
- tetherlines

## umbilical towers

- GS towers
- . **umbilical towers**
- RT gantry cranes
- launching pads

## umbras

DEF The darkest parts of shadows in which light is completely cut off by intervening objects. Lighter parts surrounding the umbras, in which the light is only partly cut off, are called penumbras. The darker central portions of sun spots, surrounded by lighter penumbra.

- RT eclipses
- penumbras
- shadows

## Umbriel

DEF A satellite of Uranus orbiting at a mean distance of 267,000 kilometers.

- GS celestial bodies
- . natural satellites
- . . Uranus satellites
- . . . **Umbriel**
- RT Uranus (planet)

## Umkehr effect

DEF Due to the presence of the ozone layer, an anomaly of the relative zenith intensities of scattered sunlight at certain wavelengths in the ultraviolet as the sun approaches the horizon.

- RT ∞ effects
- light scattering
- ozonosphere
- sunlight

ultraviolet radiation

## Umklapp process

- RT electron scattering
- phonon beams
- phonons
- photon-electron interaction
- ∞ processes

## uncambered wings

- GS airfoils
- . wings
- . . **uncambered wings**
- . . . ring wings
- RT cambered wings
- fixed wings
- thin wings
- twisted wings

## uncertain systems

- (added June 2000)
- RT control systems design
- control theory
- fuzzy systems
- linear systems
- nonlinear systems
- probability theory
- ∞ systems

## unconsciousness

- GS **unconsciousness**
- . blackout (physiology)
- . . blackout prevention
- . . narcosis
- RT anesthesia
- ∞ coma
- syncope

## uncontrolled reentry (spacecraft)

DEF The descent into a denser atmosphere of a spacecraft in an elliptical orbit due to aerodynamic drag and other perturbation forces. The gradually increasing deceleration causes some kinetic energy to be converted into atmospheric heat. The centrifugal force decreases and gravity pulls the spacecraft further into the atmosphere. The spacecraft eventually burns.

- GS atmospheric entry
- . reentry
- . . hypersonic reentry
- . . . **uncontrolled reentry (spacecraft)**
- . . spacecraft reentry
- . . . **uncontrolled reentry (spacecraft)**
- RT aerodynamic heating
- Cosmos 954 satellite
- descent
- flight paths
- plasma sheaths
- spacecraft breakup
- spacecraft survivability

## uncoupled modes

DEF Modes of vibration that can exist in systems concurrently with and independently of other modes.

- GS modes
- . vibration mode
- . . **uncoupled modes**
- RT coupled modes
- couples
- modes (standing waves)

## undamped oscillations

- GS oscillations
- . **undamped oscillations**
- RT airfoil oscillations
- flapping
- flutter
- resonant vibration
- stable oscillations
- wing oscillations

## under surface blowing

DEF Use of jets blowing on the underside of airfoils for variations in pressure distribution.

- GS blowing
- . **under surface blowing**
- RT aerodynamic characteristics

- aircraft configurations
- circulation control airfoils
- lift
- ∞ surfaces
- upper surface blowing

## undercarriages

- GS frames
- . **undercarriages**
- RT carriages
- carts
- chassis
- dollies
- landing gear
- substructures
- suspension systems (vehicles)

*undercooling*

(added May 1999)

USE **supercooling**

## underground acoustics

DEF The sounding of subsoils, rocks, etc., for mineralogy and other exploratory purposes.

- RT acoustic sounding
- exploration
- minerals
- strata

## underground communication

- GS communicating
- . **underground communication**
- RT radio communication

## underground explosions

- GS explosions
- . **underground explosions**
- RT chemical explosions
- gas explosions
- mines (excavations)
- nuclear explosions
- seismic waves
- thermonuclear explosions

*underground radio antenna grid (navy)*

USE **Seafarer project**

## underground storage

- RT decommissioning
- mines (excavations)
- missile storage
- propellant storage
- ∞ storage
- storage tanks
- waste management

## underground structures

DEF Subterranean construction of tunnels, passageways, chambers, or excavations.

- RT caves
- excavation
- foundations
- mines (excavations)
- mining
- passageways
- tunneling (excavation)

## underground transmission lines

- GS transmission lines
- . **underground transmission lines**
- RT circuits
- electric power transmission
- ∞ lines
- power lines

## underwater acoustics

- UF *hydroacoustics*
- underwater sound*
- GS acoustics
- . **underwater acoustics**
- RT acoustic scattering
- coherent acoustic radiation
- deep scattering layers
- echo sounding
- elastic waves
- flow noise
- LOFAR
- noise (sound)
- shock waves
- sonar

- sonobuoys
- sound fixing and ranging
- sound transducers
- thermoclines
- ultrasonic radiation
- ultrasonic wave transducers
- underwater breathing apparatus**
  - GS breathing apparatus
  - . **underwater breathing apparatus**
  - RT argon-oxygen atmospheres
  - bioengineering
  - helium-oxygen atmospheres
  - life support systems
- underwater communication**
  - GS telecommunication
  - . communication
  - . . **underwater communication**
  - RT Seafarer project
  - shock waves
  - sonar
  - sonobuoys
  - sound transducers
- underwater engineering**
  - RT breakwaters
  - ∞ engineering
  - submerged bodies
- underwater explosions**
  - GS explosions
  - . **underwater explosions**
  - RT antisubmarine warfare
  - chemical explosions
  - hydroballistics
  - nuclear explosions
  - thermonuclear explosions
- underwater optics**
  - RT diffraction patterns
  - diffraction propagation
  - geometrical optics
  - opacity
  - optical density
  - optical paths
  - ∞ optics
  - refractivity
- underwater photography**
  - GS imagery
  - . photography
  - . . **underwater photography**
  - RT cameras
  - color photography
  - sea water
  - seas
  - submerged bodies
- underwater physiology**
  - DEF The study of the bodily responses to the environmental stresses of the underwater milieu such as pressure, temperature and immersion effects.
  - GS physiology
  - . **underwater physiology**
  - RT diving (underwater)
  - ∞ science
  - stress (physiology)
- underwater propulsion**
  - GS propulsion
  - . marine propulsion
  - . . **underwater propulsion**
  - . . . submarine propulsion
  - RT aeroquatic vehicles
  - chemical propulsion
  - electric propulsion
  - nuclear propulsion
  - propeller drive
  - torpedo engines
- underwater research laboratories**
  - GS laboratories
  - . **underwater research laboratories**
  - research vehicles
  - . **underwater research laboratories**
  - submerged bodies
  - . **underwater research laboratories**
  - water vehicles
- . underwater vehicles
- . . **underwater research laboratories**
- RT bathymeters
- ocean data acquisitions systems
- oceanography
- underwater resources**
  - DEF Earth resources (minerals, petroleum, etc.) within or under the oceans.
  - GS resources
  - . Earth resources
  - . . **underwater resources**
  - RT crude oil
  - dredging
  - fossil fuels
  - geothermal resources
  - marine resources
  - mineral deposits
  - ocean bottom
  - oceanography
  - oil exploration
  - sea water
  - water resources
- underwater sound*
- USE **underwater acoustics**
- underwater structures**
  - RT breakwaters
  - structural design
  - submerged bodies
- underwater tests**
  - GS environmental tests
  - . **underwater tests**
  - . . neutral buoyancy simulation
  - RT corrosion tests
  - diving (underwater)
  - water immersion
- underwater to surface missiles**
  - GS missiles
  - . **underwater to surface missiles**
  - . . Subroc missile
  - RT ∞ surfaces
- underwater trajectories**
  - GS trajectories
  - . **underwater trajectories**
  - RT antisubmarine warfare
  - hydroballistics
  - missile trajectories
  - Subroc missile
  - torpedoes
- underwater vehicles**
  - GS water vehicles
  - . **underwater vehicles**
  - . . submarines
  - . . . ballistic missile submarines
  - . . . guided missile submarines
  - . . . trident submarine
  - . . underwater research laboratories
  - RT aeroquatic vehicles
  - boats
  - ∞ military vehicles
  - research vehicles
  - ships
  - submerged bodies
  - surface vehicles
  - ∞ vehicles
- uniaxial strain*
- USE **axial strain**
- unidentified flying objects**
  - UF *UFO*
  - RT ∞ aircraft
  - extraterrestrial intelligence
  - ∞ spacecraft
  - ∞ vehicles
- unified field theory**
  - DEF Any theory which attempts to express gravitational theory and electromagnetic theory within a single unified framework; usually, an attempt to generalize Einstein's general theory of gravitation alone to a theory of gravitation and classical electromagnetism.
- GS field theory (physics)
- . gauge theory
- . . **unified field theory**
- . . . electroweak model
- . . . standard model (particle physics)
- RT electromagnetic fields
- electromagnetic interactions
- electromagnetism
- gravitational theory
- gravitational fields
- particle theory
- plasma physics
- relativity
- string theory
- supergravity
- supersymmetry
- theoretical physics
- unified S band**
  - RT Apollo spacecraft
  - carrier frequencies
  - circumlunar communication
  - communication equipment
  - differential pulse code modulation
  - manned space flight network
  - pulse code modulation
  - satellite communication
  - spacecraft communication
  - spacecraft tracking
  - superhigh frequencies
  - ultrahigh frequencies
- uniform flow**
  - GS fluid flow
  - . **uniform flow**
  - . . Blasius flow
  - RT aerodynamics
  - gas flow
  - heat transmission
  - laminar flow
  - liquid flow
  - mass flow
  - multiphase flow
  - nonuniform flow
  - pipe flow
  - pressure gradients
  - quasi-steady states
  - single-phase flow
  - solids flow
  - steady flow
  - steam flow
  - subcritical flow
  - turbulent flow
  - unsteady flow
- unimolecular structures**
  - RT molecular structure
  - ∞ structures
- unionization**
  - RT federations
  - organizing
  - personnel
  - ∞ unions
- ∞ **unions**
  - SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
  - RT Boolean algebra
  - unionization
  - unions (connectors)
- unions (connectors)**
  - GS connectors
  - . **unions (connectors)**
  - RT couplings
  - fasteners
  - fittings
  - joints (junctions)
  - linkages
  - ∞ unions
- uniphase flow*
- USE **single-phase flow**
- unipolar transistors*
- USE **field effect transistors**
- uniqueness**
  - RT abnormalities

## uniqueness theorem

ill-conditioned problems  
(mathematics)  
ill-posed problems (mathematics)  
singularity (mathematics)

### uniqueness theorem

GS theorems  
. **uniqueness theorem**  
RT algebra  
complex variables  
geometry  
number theory  
probability theory  
real variables

### United Arab Emirates

GS nations  
. **United Arab Emirates**

### United Kingdom

UF *Great Britain*  
GS nations  
. **United Kingdom**  
.. England  
.. Gibraltar  
.. Northern Ireland  
.. Scotland  
.. Wales  
RT English Channel  
Europe  
UK space program

### United Kingdom satellites

USE **UK satellites**

### United Nations

RT communities  
developing nations  
European Union  
federations  
international cooperation  
international law  
nations  
organizations  
politics  
sea law  
World Meteorological Organization

### United States

UF *USA (United States)*  
GS nations  
. **United States**  
.. Alabama  
.. Alaska  
.. Arizona  
.. Arkansas  
.. California  
.. Colorado  
.. Connecticut  
.. Delaware  
.. District of Columbia  
.. Florida  
.. Georgia  
.. Guam  
.. Hawaii  
.. Idaho  
.. Illinois  
.. Indiana  
.. Iowa  
.. Kansas  
.. Kentucky  
.. Louisiana  
.. Maine  
.. Maryland  
.. Massachusetts  
.. Michigan  
.. Minnesota  
.. Mississippi  
.. Missouri  
.. Montana  
.. Nebraska  
.. Nevada  
.. New Hampshire  
.. New Jersey  
.. New Mexico  
.. New York  
.. North Carolina  
.. North Dakota  
.. Ohio  
.. Oklahoma

.. Oregon  
.. Pennsylvania  
.. Puerto Rico  
.. Rhode Island  
.. South Carolina  
.. South Dakota  
.. Tennessee  
.. Texas  
.. Utah  
.. Vermont  
.. Virgin Islands  
.. Virginia  
.. Washington  
.. West Virginia  
.. Wisconsin  
.. Wyoming

RT Aleutian Islands (US)  
Cascade Range (CA-OR-WA)  
Central Atlantic Region (US)  
Great Lakes (North America)  
Great Plains Corridor (North America)  
International Field Year for Great  
Lakes  
International Hydrological Decade  
Missouri River (US)  
New England (US)  
North America  
Pacific Northwest (US)  
Panama Canal Zone  
Rocky Mountains (North America)  
Southern California

### units of measurement

DEF Precisely stated quantities in terms of which the magnitudes of other quantities of the same kind can be stated. f shichrms of which the magnitude of other Precisely specified quantities in te

GS **units of measurement**  
. International System of Units  
RT conversion tables  
dimensional analysis  
dimensions  
∞ measurement  
metrication  
metrology  
month  
parameterization  
sidereal time  
symbols  
time

### unity

RT homogeneity  
stability

### Unity connecting module

(added November 1998)

DEF Component of the International Space Station providing six ports that serve as connecting points for other station modules and framework elements.

GS modules  
. space station modules  
.. **Unity connecting module**  
RT Integrated Truss Structure Z1  
International Space Station  
spacecraft docking

### Univac 80 computer

GS data processing equipment  
. computers  
.. digital computers  
.. **Univac 80 computer**  
.. Univac computers  
.. **Univac 80 computer**

### Univac 418 computer

GS data processing equipment  
. computers  
.. digital computers  
.. **Univac 418 computer**  
.. Univac computers  
.. **Univac 418 computer**

### Univac 490 computer

GS data processing equipment  
. computers  
.. digital computers  
.. **Univac 490 computer**

.. Univac computers  
.. **Univac 490 computer**

### Univac 494 computer

GS data processing equipment  
. computers  
.. digital computers  
.. **Univac 494 computer**  
.. Univac computers  
.. **Univac 494 computer**

### Univac 1100 series computers

GS data processing equipment  
. computers  
.. analog computers  
.. **Univac 1100 series computers**  
.. Univac 1105 computer  
.. Univac 1106 computer  
.. Univac 1107 computer  
.. Univac 1108 computer  
.. Univac 1110 computer  
.. digital computers  
.. **Univac 1100 series computers**  
.. Univac 1105 computer  
.. Univac 1106 computer  
.. Univac 1107 computer  
.. Univac 1108 computer  
.. Univac 1110 computer  
.. Univac computers  
.. **Univac 1100 series computers**  
.. Univac 1105 computer  
.. Univac 1106 computer  
.. Univac 1107 computer  
.. Univac 1108 computer  
.. Univac 1110 computer

### Univac 1105 computer

GS data processing equipment  
. computers  
.. analog computers  
.. Univac 1100 series computers  
.. **Univac 1105 computer**  
.. digital computers  
.. Univac 1100 series computers  
.. **Univac 1105 computer**  
.. Univac computers  
.. Univac 1100 series computers  
.. **Univac 1105 computer**

### Univac 1106 computer

GS data processing equipment  
. computers  
.. analog computers  
.. Univac 1100 series computers  
.. **Univac 1106 computer**  
.. digital computers  
.. Univac 1100 series computers  
.. **Univac 1106 computer**  
.. Univac computers  
.. Univac 1100 series computers  
.. **Univac 1106 computer**

### Univac 1107 computer

GS data processing equipment  
. computers  
.. analog computers  
.. Univac 1100 series computers  
.. **Univac 1107 computer**  
.. digital computers  
.. Univac 1100 series computers  
.. **Univac 1107 computer**  
.. Univac computers  
.. Univac 1100 series computers  
.. **Univac 1107 computer**

### Univac 1108 computer

GS data processing equipment  
. computers  
.. analog computers  
.. Univac 1100 series computers  
.. **Univac 1108 computer**  
.. digital computers  
.. Univac 1100 series computers  
.. **Univac 1108 computer**  
.. Univac computers  
.. Univac 1100 series computers  
.. **Univac 1108 computer**

### Univac 1110 computer

GS data processing equipment

- . computers
  - .. analog computers
  - ... Univac 1100 series computers
  - .... **Univac 1110 computer**
  - .. digital computers
  - ... Univac 1100 series computers
  - .... **Univac 1110 computer**
  - .. Univac computers
  - ... Univac 1100 series computers
  - .... **Univac 1110 computer**
- Univac 1230 computer**
  - GS data processing equipment
    - . computers
    - .. digital computers
    - ... **Univac 1230 computer**
    - .. Univac computers
    - ... **Univac 1230 computer**
- Univac computers**
  - GS data processing equipment
    - . computers
    - .. **Univac computers**
    - ... Univac 1100 series computers
    - .... Univac 1105 computer
    - .... Univac 1106 computer
    - .... Univac 1107 computer
    - .... Univac 1108 computer
    - .... Univac 1110 computer
    - ... Univac 80 computer
    - ... Univac 418 computer
    - ... Univac 490 computer
    - ... Univac 494 computer
    - ... Univac 1230 computer
    - ... Univac Larc computer
  - RT digital computers
- Univac Larc computer**
  - GS data processing equipment
    - . computers
    - .. digital computers
    - ... **Univac Larc computer**
    - .. Univac computers
    - ... **Univac Larc computer**
- universal time**
  - DEF Time defined by the rotational motion of the Earth and determined from the apparent diurnal motions which reflect this rotation; because of variations in the rate of rotation, universal time is not rigorously uniform. Also called Greenwich mean time.
  - GS time
    - . **universal time**
  - RT ephemeris time
    - time synchronization
- universe**
  - UF *metagalaxy*
  - RT big bang cosmology
    - celestial bodies
    - cosmology
    - ∞ cosmos
    - dark energy
    - dark matter
    - large-scale structure of the universe
    - relic radiation
- universities**
  - UF *colleges*
  - RT education
    - instructors
    - learning
    - schools
    - students
- university program**
  - GS programs
    - . **university program**
  - RT bureaus (organizations)
    - investigation
    - NASA programs
    - teams
- UNIX (operating system)**
  - (added October 1988)
  - GS computer programs
    - . computer systems programs
    - .. operating systems (computers)
    - ... **UNIX (operating system)**
- RT computer programming
  - software engineering
  - workstations
- unloading**
  - RT ∞ discharge
    - disposal
    - dumping
    - ejection
    - emptying
    - evacuating (transportation)
    - expulsion
    - loading operations
    - materials handling
    - releasing
    - removal
    - spreading
- unloading waves**
  - GS elastic waves
    - . **unloading waves**
- unmanned aerial vehicles*
  - USE **pilotless aircraft**
- unmanned aircraft systems**
  - (added August 2007)
  - DEF Pilotless flight systems consisting of an unmanned aircraft, sensors, payloads, communications equipment carried on board the aircraft, and ground control stations that control the flight of the aircraft and receive information collected and transmitted by the payloads.
  - UF *UAS*
  - RT aerial reconnaissance
    - ∞ military aircraft
    - pilotless aircraft
    - reconnaissance aircraft
    - remotely piloted vehicles
    - ∞ systems
- unmanned ground vehicles**
  - (added July 2002)
  - DEF Ground vehicles using remote or autonomous control.
  - UF *UGV (vehicles)*
  - GS surface vehicles
    - . **unmanned ground vehicles**
  - RT autonomous navigation
    - remotely piloted vehicles
    - robot control
    - robotics
    - roving vehicles
    - surface navigation
- unmanned spacecraft**
  - GS **unmanned spacecraft**
    - . Echo 2 satellite
    - . HEAO 1
    - . HEAO 2
    - . HEAO 3
    - . HOTOL launch vehicle
    - . Pioneer Venus spacecraft
    - .. Pioneer Venus 1 spacecraft
    - .. Pioneer Venus 2 spacecraft
    - ... Pioneer Venus 2 entry probes
    - .... Pioneer Venus 2 night probe
    - .... Pioneer Venus 2 sounder probe
    - ... Pioneer Venus 2 transporter bus
    - . space probes
    - .. Explorer 18 satellite
    - .. Giotto mission
    - .. Jupiter probes
    - ... Galileo probe
    - ... Galileo spacecraft
    - .. lunar probes
    - ... Lunik lunar probes
    - .... Lunik 2 lunar probe
    - .... Lunik 3 lunar probe
    - .... Lunik 9 lunar probe
    - .... Lunik 10 lunar probe
    - .... Lunik 11 lunar probe
    - .... Lunik 12 lunar probe
    - .... Lunik 13 lunar probe
    - .... Lunik 14 lunar probe
    - .... Lunik 16 lunar probe
    - .... Lunik 17 lunar probe
    - .... Lunik 19 lunar probe
    - .... Lunik 20 lunar probe
    - .... Lunik 22 lunar probe
  - ... Ranger lunar probes
  - .... Ranger 1 lunar probe
  - .... Ranger 2 lunar probe
  - .... Ranger 3 lunar probe
  - .... Ranger 4 lunar probe
  - .... Ranger 5 lunar probe
  - .... Ranger 6 lunar probe
  - .... Ranger 7 lunar probe
  - .... Ranger 8 lunar probe
  - .... Ranger 9 lunar probe
  - ... Ranger lunar landing vehicles
  - ... Surveyor lunar probes
  - .... Surveyor 1 lunar probe
  - .... Surveyor 2 lunar probe
  - .... Surveyor 3 lunar probe
  - .... Surveyor 4 lunar probe
  - .... Surveyor 5 lunar probe
  - .... Surveyor 6 lunar probe
  - .... Surveyor 7 lunar probe
  - ... LCROSS (satellite)
  - ... Lunar Reconnaissance Orbiter
  - .. Mariner space probes
  - ... Mariner 1 space probe
  - ... Mariner 2 space probe
  - ... Mariner 3 space probe
  - ... Mariner 4 space probe
  - ... Mariner 5 space probe
  - ... Mariner 6 space probe
  - ... Mariner 7 space probe
  - ... Mariner 8 space probe
  - ... Mariner 9 space probe
  - ... Mariner 10 space probe
  - ... Mariner 11 space probe
  - ... Mariner R 2 space probe
  - .. Mariner spacecraft
  - ... Mariner C spacecraft
  - ... Mariner Venus 67 spacecraft
  - .. Mars probes
  - ... Advanced Recon Electric Spacecraft
  - ... Mariner 3 space probe
  - ... Mariner 4 space probe
  - ... Mariner 6 space probe
  - ... Mariner 7 space probe
  - ... Mariner 8 space probe
  - ... Mariner 9 space probe
  - ... Mars 1 spacecraft
  - ... Mars 2 spacecraft
  - ... Mars 3 spacecraft
  - ... Mars 4 spacecraft
  - ... Mars 5 spacecraft
  - ... Mars 6 spacecraft
  - ... Mars 7 spacecraft
  - ... Mars Observer
  - ... Mars Pathfinder
  - ... Viking 1975 entry vehicle
  - ... Viking spacecraft
  - ... Viking 1 spacecraft
  - .... Viking lander 1
  - .... Viking orbiter 1
  - ... Viking 2 spacecraft
  - .... Viking lander 2
  - .... Viking orbiter 2
  - ... Viking lander spacecraft
  - .... Viking lander 1
  - .... Viking lander 2
  - ... Viking orbiter spacecraft
  - .... Viking orbiter 1
  - .... Viking orbiter 2
  - .... Viking orbiter 1975
  - ... Mars Climate Orbiter
  - ... Mars Express
  - ... Mars Global Surveyor
  - ... Mars Polar Lander
  - ... Mars Reconnaissance Orbiter
  - ... Nozomi Mars Orbiter
  - ... Phobos spacecraft
  - ... Phoenix Mars Lander
  - ... Zond 2 space probe
  - .. Pioneer space probes
  - ... Pioneer 1 space probe
  - ... Pioneer 2 space probe
  - ... Pioneer 3 space probe
  - ... Pioneer 4 space probe
  - ... Pioneer 5 space probe
  - ... Pioneer 6 space probe
  - ... Pioneer 7 space probe
  - ... Pioneer 8 space probe
  - ... Pioneer 9 space probe



## unsaturation (chemistry)

... Pioneer 10 space probe  
... Pioneer 11 space probe  
... Pioneer Venus 2 entry probes  
... Pioneer Venus 2 night probe  
... Pioneer Venus 2 sounder probe  
... solar probes  
... Helios 1  
... Helios 2  
... Helios A  
... Helios B  
... Starprobe spacecraft  
... Sunblazer space probe  
... Venus probes  
... Magellan spacecraft (NASA)  
... Mariner 1 space probe  
... Mariner 2 space probe  
... Mariner 5 space probe  
... Mariner 10 space probe  
... Pioneer Venus 2 spacecraft  
... Pioneer Venus 2 entry probes  
... Pioneer Venus 2 night probe  
... Pioneer Venus 2 sounder probe  
... Pioneer Venus 2 transporter bus  
... Venera satellites  
... Venera 2 satellite  
... Venera 3 satellite  
... Venera 4 satellite  
... Venera 5 satellite  
... Venera 6 satellite  
... Venera 7 satellite  
... Venera 8 satellite  
... Venera 9 satellite  
... Venera 10 satellite  
... Venera 11 satellite  
... Venera 12 satellite  
... Zond 1 space probe  
... Zond 3 space probe  
... Zond 4 space probe  
... Zond 5 space probe  
... Zond 6 space probe  
... Zond 7 space probe  
... Zond 8 space probe  
... Huygens probe  
... MESSENGER (spacecraft)  
... Microwave Anisotropy Probe  
... Voyager 1 spacecraft  
... Voyager 2 spacecraft  
... technology feasibility spacecraft  
... Zond space probes  
... Zond 1 space probe  
... Zond 2 space probe  
... Zond 3 space probe  
... Zond 4 space probe  
... Zond 5 space probe  
... Zond 6 space probe  
... Zond 7 space probe  
... Zond 8 space probe

RT artificial satellites  
autonomous docking  
communication satellites  
geophysical satellites  
gravity gradient satellites  
inflatable spacecraft  
interplanetary spacecraft  
lunar landing modules  
lunar satellites  
lunar spacecraft  
manned spacecraft  
Mariner program  
meteorological satellites  
military spacecraft  
reconnaissance spacecraft  
recoverable spacecraft  
rendezvous spacecraft  
reusable spacecraft  
SIRS B satellite  
space capsules  
∞ spacecraft  
Voyager project

## unsaturation (chemistry)

DEF A state in which the atomic bonds of an organic compound's chain or ring are not completely satisfied (not saturated); unsaturation usually results in a double bond (as for olefins) or a triple bond (as for the acetylenes).

RT chemical bonds  
∞ chemistry

precipitation (chemistry)  
∞ saturation  
saturation (chemistry)

## unsteady aerodynamics

GS mechanics (physics)  
... fluid mechanics  
... fluid dynamics  
... gas dynamics  
... aerodynamics  
... **unsteady aerodynamics**  
RT aerodynamic characteristics  
aerodynamic forces  
aerodynamic stability  
aeroelasticity  
aeroservoelasticity  
flutter  
flutter analysis  
unsteady flow  
wing oscillations

## unsteady flow

UF *pulsating flow*  
GS fluid flow  
... **unsteady flow**  
... oscillating flow  
RT aerodynamics  
critical flow  
∞ flow  
flow stability  
flow velocity  
gas flow  
heat transmission  
hydrodynamic coefficients  
laminar flow  
liquid flow  
mass flow  
method of characteristics  
multiphase flow  
nonequilibrium flow  
nonNewtonian flow  
nonuniform flow  
orifice flow  
pipe flow  
pressure gradients  
single-phase flow  
solids flow  
steady flow  
steady state  
steam flow  
Strouhal number  
subcritical flow  
supercritical flow  
turbulence  
uniform flow  
unsteady aerodynamics

## unsteady state

RT ∞ equilibrium  
fluid dynamics  
metastable state  
nonequilibrium conditions  
stability  
steady state  
systems stability  
thermodynamics

## unstructured grids (mathematics)

(added May 1995)

DEF In computational fluid dynamics, grid systems where the flowfield is discretized into triangular-shaped elements for two-dimensional fields, and tetrahedral elements for three-dimensional fields. In this type of grid system the grid points cannot be associated with grid lines.

GS coordinates  
... computational grids  
... **unstructured grids (mathematics)**  
RT computational fluid dynamics  
finite element method  
finite volume method  
grid generation (mathematics)  
multigrid methods  
structured grids (mathematics)

## unswept wings

GS airfoils  
... wings  
... **unswept wings**

... infinite span wings  
... rectangular wings  
... ring wings

RT fixed wings  
swept wings  
wing planforms

## up-converters

DEF Parametric amplifiers characterized by the output signal frequencies being greater than the frequencies of the input signals.

GS frequency converters  
... **up-converters**  
RT ∞ converters  
parametric frequency converters  
transformers

## updrafts

USE **vertical air currents**

## upgrading

RT beneficium  
concentrating  
enrichment  
experience  
improvement  
promotion  
public relations  
purification  
quality  
refining

## uplinking

DEF The transmission of signals from ground terminals to satellites in telecommunication systems.

RT carrier to noise ratios  
communication satellites  
downlinking  
frequency reuse  
microwave transmission  
satellite transmission  
transmission efficiency

## upper air

USE **upper atmosphere**

## upper atmosphere

DEF The general term applied to the atmosphere above the troposphere. Used for upper air.

UF *upper air*  
GS Earth atmosphere  
... **upper atmosphere**  
... Earth ionosphere  
... E region  
... E-1 layer  
... E-2 layer  
... sporadic E layer  
... lower ionosphere  
... D region  
... upper ionosphere  
... F region  
... F 1 region  
... F 2 region  
... exosphere  
... thermosphere  
... turbopause

RT acoustic sounding  
aeronomy  
chemosphere  
field aligned currents  
heterosphere  
high altitude  
homosphere  
meteor trails  
meteorological balloons  
middle atmosphere  
ozonosphere  
plasmasphere  
proton precipitation  
radiation belts  
satellite atmospheres  
Upper Atmosphere Research Satellite (UARS)

## Upper Atmosphere Research Satellite (UARS)

(added August 1989)  
UF *UARS (satellite)*

- GS artificial satellites  
 . scientific satellites  
 . . **Upper Atmosphere Research Satellite (UARS)**
- RT upper atmosphere
- upper ionosphere**
- GS Earth atmosphere  
 . upper atmosphere  
 . . Earth ionosphere  
 . . . **upper ionosphere**  
 . . . . F region  
 . . . . . F 1 region  
 . . . . . F 2 region
- RT E region
- upper stage rocket engines**
- GS engines  
 . rocket engines  
 . . **upper stage rocket engines**
- RT Ares 1 upper stage  
 Inertial Upper Stage  
 multistage rocket vehicles  
 spacecraft configurations  
 spinning solid upper stage  
 stage separation
- upper surface blowing**
- DEF Use of jet blowing on the upper surface of airfoils to create variations in pressure distribution.
- GS blowing  
 . **upper surface blowing**
- RT aerodynamic characteristics  
 aircraft configurations  
 circulation control airfoils  
 lift  
 ∞ surfaces  
 under surface blowing
- upper surface blown flaps**
- GS airfoils  
 . flaps (control surfaces)  
 . . externally blown flaps  
 . . . **upper surface blown flaps**  
 control surfaces  
 . flaps (control surfaces)  
 . . externally blown flaps  
 . . . **upper surface blown flaps**
- RT aircraft stability  
 blowing  
 boundary layer control  
 lift augmentation  
 lift devices  
 ∞ surfaces
- Upper Volta*
- USE **Burkina**
- upsetting**
- RT cold pressing  
 cold working  
 forming techniques  
 hot isostatic pressing  
 hot pressing  
 hot working  
 pressing (forming)  
 stamping
- upstream**
- RT air currents  
 water currents  
 wind direction
- upwash**
- RT downwash  
 ∞ draft  
 interference drag  
 interference lift
- upwelling*
- USE **upwelling water**
- upwelling water**
- DEF The process by which water rises from a deeper to a shallower depth. Used for upwelling.
- UF *upwelling*
- RT atmospheric circulation  
 coasts
- ocean currents  
 thermohaline circulation  
 wind (meteorology)  
 wind direction
- upwind schemes (mathematics)**  
*(added July 1992)*
- GS analysis (mathematics)  
 . numerical analysis  
 . . approximation  
 . . . **upwind schemes (mathematics)**
- RT computational fluid dynamics  
 Euler equations of motion  
 finite difference theory
- uracil**
- GS bases (chemical)  
 . **uracil**  
 nitrogen compounds  
 . **uracil**  
 organic compounds  
 . cyclic compounds  
 . . heterocyclic compounds  
 . . . pyrimidines  
 . . . . **uracil**
- RT alloxan  
 uridylic acid
- uranium**
- GS chemical elements  
 . actinide series  
 . . **uranium**  
 . . . uranium isotopes  
 . . . . uranium 232  
 . . . . uranium 233  
 . . . . uranium 234  
 . . . . uranium 235  
 . . . . uranium 238  
 metals  
 . actinide series  
 . . **uranium**  
 . . . uranium isotopes  
 . . . . uranium 232  
 . . . . uranium 233  
 . . . . uranium 234  
 . . . . uranium 235  
 . . . . uranium 238  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . uranium 238
- RT fissionable materials  
 jet membrane process  
 nuclear fuels  
 uranium plasmas
- uranium 232**
- GS chemical elements  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 232**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . **uranium 232**  
 . . . uranium isotopes  
 . . . . **uranium 232**  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 232**
- uranium 233**
- GS chemical elements  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 233**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . **uranium 233**  
 . . . uranium isotopes  
 . . . . **uranium 233**  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 233**
- uranium 234**
- GS chemical elements  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 234**  
 . nuclides  
 . . isotopes  
 . . . uranium isotopes  
 . . . . **uranium 234**  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 234**
- uranium 235**
- GS chemical elements  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 235**  
 . nuclides  
 . . isotopes  
 . . . uranium isotopes  
 . . . . **uranium 235**  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 235**
- RT nuclear fuels
- uranium 238**
- GS chemical elements  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 238**  
 . nuclides  
 . . isotopes  
 . . . radioactive isotopes  
 . . . . **uranium 238**  
 . . . uranium isotopes  
 . . . . **uranium 238**  
 metals  
 . actinide series  
 . . uranium  
 . . . uranium isotopes  
 . . . . **uranium 238**
- RT nuclear fuels
- uranium alloys**
- GS alloys  
 . **uranium alloys**
- RT nuclear fuel elements  
 nuclear fuels
- uranium carbides**
- GS actinide series compounds  
 . uranium compounds  
 . . **uranium carbides**  
 carbon compounds  
 . carbides  
 . . **uranium carbides**
- RT ceramic nuclear fuels  
 nuclear fuel elements  
 nuclear fuels
- uranium compounds**
- GS actinide series compounds  
 . **uranium compounds**  
 . . uranium carbides  
 . . uranium fluorides  
 . . uranium oxides
- RT ceramic nuclear fuels  
 ∞ chemical compounds  
 ∞ metal compounds  
 nuclear fuels
- uranium fluorides**
- GS actinide series compounds  
 . uranium compounds  
 . . **uranium fluorides**  
 halogen compounds  
 . fluorine compounds  
 . . fluorides  
 . . . metal fluorides

## uranium isotopes

- . . . . **uranium fluorides**
- . halides
- . . fluorides
- . . . metal fluorides
- . . . . **uranium fluorides**
- . . metal halides
- . . . metal fluorides
- . . . . **uranium fluorides**
- uranium isotopes**
- GS chemical elements
- . actinide series
- . . uranium
- . . . . **uranium isotopes**
- . . . . uranium 232
- . . . . uranium 233
- . . . . uranium 234
- . . . . uranium 235
- . . . . uranium 238
- . nuclides
- . . isotopes
- . . . . **uranium isotopes**
- . . . . uranium 232
- . . . . uranium 233
- . . . . uranium 234
- . . . . uranium 235
- . . . . uranium 238
- metals
- . actinide series
- . . uranium
- . . . . **uranium isotopes**
- . . . . uranium 232
- . . . . uranium 233
- . . . . uranium 234
- . . . . uranium 235
- . . . . uranium 238
- uranium oxides**
- GS actinide series compounds
- . uranium compounds
- . . **uranium oxides**
- chalcogenides
- . oxides
- . . metal oxides
- . . . **uranium oxides**
- RT ceramic nuclear fuels
- mixed oxides
- nuclear fuels
- uranium plasmas**
- GS metals
- . **uranium plasmas**
- particles
- . charged particles
- . . energetic particles
- . . . plasmas (physics)
- . . . . metallic plasmas
- . . . . . **uranium plasmas**
- . corpuscular radiation
- . . energetic particles
- . . . plasmas (physics)
- . . . . metallic plasmas
- . . . . . **uranium plasmas**
- RT magnetohydrodynamics
- plasma composition
- plasma physics
- radioactive materials
- uranium
- Uranus (planet)**
- GS celestial bodies
- . planets
- . . gas giant planets
- . . . **Uranus (planet)**
- RT Ariel
- Cordelia
- Miranda
- Oberon
- Puck
- Titania
- Umbriel
- Uranus atmosphere
- Uranus rings
- Voyager 2 spacecraft
- Uranus atmosphere**
- DEF The atmosphere of the planet Uranus.
- GS environments
- . extraterrestrial environments
- . . planetary environments
- . . . planetary atmospheres
- . . . . **Uranus atmosphere**
- RT aerospace environments
- ∞ atmospheres
- gas giant planets
- hydrogen
- methane
- planetary ionospheres
- Uranus (planet)
- Uranus rings**
- DEF Ring structures encircling the planet
- Uranus and similar to those of the planet Saturn.
- GS celestial bodies
- . planetary rings
- . . **Uranus rings**
- RT Jupiter rings
- moonlets
- natural satellites
- planetary structure
- ∞ rings
- Saturn rings
- Uranus (planet)
- Uranus satellites**
- GS celestial bodies
- . natural satellites
- . . **Uranus satellites**
- . . . Ariel
- . . . Cordelia
- . . . Miranda
- . . . Oberon
- . . . Puck
- . . . Titania
- . . . Umbriel
- urban areas*
- USE **cities**
- urban development**
- RT cities
- communities
- ∞ development
- economic development
- industrial areas
- land use
- megalopolises
- operations research
- parks
- planning
- ∞ plans
- regional planning
- residential areas
- resources
- Starsite program
- technologies
- urban planning**
- GS planning
- . regional planning
- . . **urban planning**
- RT census
- cities
- communities
- heat islands
- highways
- land management
- land use
- parks
- public health
- recreation
- social factors
- sociology
- Starsite program
- streets
- urban research**
- RT cities
- communities
- land use
- recreation
- social factors
- streets
- urban transportation**
- GS transportation
- . **urban transportation**
- RT automated guideway transit vehicles
- automated mixed traffic vehicles
- automated transit vehicles
- industrial areas
- megalopolises
- rail transportation
- rapid transit systems
- regional planning
- surface vehicles
- ureas**
- GS nitrogen compounds
- . amides
- . . **ureas**
- . . . difluorourea
- . . . thioureas
- . . . thiuronium
- RT diuretics
- fertilizers
- urine
- ureilites**
- (added December 1988)
- GS celestial bodies
- . meteorites
- . . stony meteorites
- . . . achondrites
- . . . . **ureilites**
- . . . carbonaceous meteorites
- . . . . **ureilites**
- RT meteoritic diamonds
- urethanes**
- GS esters
- . Carbamates (tradenam)
- . . **urethanes**
- poisons
- . pesticides
- . . insecticides
- . . . Carbamates (tradenam)
- . . . . **urethanes**
- RT cyanates
- uric acid**
- GS acids
- . **uric acid**
- fungicides
- . xanthines
- . . **uric acid**
- nitrogen compounds
- . xanthines
- . . **uric acid**
- organic compounds
- . cyclic compounds
- . . heterocyclic compounds
- . . . purines
- . . . . xanthines
- . . . . . **uric acid**
- RT alloxan
- uridylic acid**
- GS acids
- . **uridylic acid**
- organic compounds
- . nucleotides
- . . **uridylic acid**
- . organic phosphorus compounds
- . . **uridylic acid**
- phosphorus compounds
- . organic phosphorus compounds
- . . **uridylic acid**
- . phosphates
- . . **uridylic acid**
- RT amino acids
- nucleic acids
- uracil
- urinalysis**
- GS chemical tests
- . chemical analysis
- . . **urinalysis**
- RT diabetes mellitus
- physiological tests
- urine
- urination**
- UF *micturition*
- RT diuresis
- urine
- water balance
- urine**
- GS body fluids

- . **urine**
  - wastes
  - . liquid wastes
  - . . **urine**
  - . metabolic wastes
  - . . human wastes
  - . . . **urine**
  - RT antidiuretics
  - creatinine
  - excretion
  - feces
  - hematuria
  - kidneys
  - ureas
  - urinalysis
  - urination
- urography**
- GS imagery
  - . photography
  - . . **urography**
  - . radiography
  - . . **urography**
  - RT black and white photography
- urolithiasis**
- GS diseases
  - . **urolithiasis**
  - RT calculi
  - kidneys
  - urology
- urology**
- GS medical science
  - . **urology**
  - RT bladder
  - genitourinary system
  - kidneys
  - urolithiasis
- Uruguay**
- GS nations
  - . **Uruguay**
  - RT South America
- US Laboratory Module (ISS)*  
(added February 2001)  
USE **Destiny Laboratory Module**
- US-2A aircraft*  
USE **S-2 aircraft**
- USA (United States)*  
USE **United States**
- user manuals (computer programs)**
- GS documents
  - . handbooks
  - . . **user manuals (computer programs)**
  - . manuals
  - . . **user manuals (computer programs)**
  - RT computer programs
  - programs
  - report generators
  - ∞ routines
- subroutines
- user requirements**
- GS requirements
  - . **user requirements**
  - RT commerce lab
  - human-computer interface
  - international cooperation
  - specifications
- user-computer interface*  
USE **human-computer interface**
- USNS Kingsport*  
USE **satellite communications ships**
- Utah**
- GS nations
  - . United States
  - . . **Utah**
  - RT Colorado Plateau (US)
  - Colorado River (North America)
  - Great Basin (US)
  - Great Salt Lake (UT)
- uterus**
- GS anatomy
  - . genitourinary system
  - . . reproductive systems
  - . . . **uterus**
- utilities**
- RT ∞ electric equipment
  - ∞ electric power
  - garbage
  - industries
  - integrated energy systems
  - logistics
  - Modular Integrated Utility System
  - services
  - site selection
  - telephones
  - waste disposal
  - water
- utility aircraft**
- GS **utility aircraft**
  - . BO-105 helicopter
  - . DHC 4 aircraft
  - . DHC 5 aircraft
  - . HH-43 helicopter
  - . S-2 aircraft
  - . Saab 105 aircraft
  - . T-39 aircraft
  - . U-2 aircraft
  - . U-10 aircraft
  - . UH-1 helicopter
  - . UH-2 helicopter
  - . UH-60A helicopter
  - . UH-61A helicopter
  - . XV-8A aircraft
  - . Z-37 aircraft
  - RT ∞ aircraft
  - biplanes
  - cargo aircraft
  - commercial aircraft
  - general aviation aircraft
- helicopters
  - light aircraft
  - ∞ military aircraft
  - observation aircraft
  - reconnaissance aircraft
  - ∞ subsonic aircraft
  - transport aircraft
  - V/STOL aircraft
  - water takeoff and landing aircraft
- utilization**
- UF *application*
  - GS **utilization**
  - . coal utilization
  - . geothermal energy utilization
  - . laser applications
  - . . laser ablation
  - . . laser annealing
  - . . laser cooling
  - . . laser cutting
  - . . laser deposition
  - . . . pulsed laser deposition
  - . . laser drilling
  - . . laser fusion
  - . . laser guidance
  - . . laser guide stars
  - . . laser heating
  - . . laser induced fluorescence
  - . . laser interferometry
  - . . laser machining
  - . . laser microscopy
  - . . laser power beaming
  - . . laser propulsion
  - . . laser spectroscopy
  - . . . optogalvanic spectroscopy
  - . . laser ranging
  - . . laser weapons
  - . . laser welding
  - . . . satellite laser ranging
  - . reuse
  - . . software reuse
  - . in situ resource utilization
  - . technology utilization
  - . waste energy utilization
  - . waste utilization
  - . windpower utilization
  - RT consumption
  - depletion
  - efficiency
- utricle**
- RT plants (botany)
  - seeds
- UV Ceti stars*  
USE **flare stars**
- UV lasers*  
USE **ultraviolet lasers**
- Uzbekistan**  
(added August 1993)
- GS nations
  - . **Uzbekistan**
  - RT Asia

# V

## V band

USE **extremely high frequencies**

## V grooves

GS grooves  
 . **V grooves**  
 . . riblets  
 RT machining  
 micromachining  
 notches

## V-1 missile

GS missiles  
 . surface to surface missiles  
 . . **V-1 missile**  
 RT liquid propellant rocket engines  
 pulsejet engines

## V-2 missile

GS missiles  
 . ballistic missiles  
 . . **V-2 missile**  
 RT liquid propellant rocket engines

## V-3 aircraft

USE **XV-3 aircraft**

## V-4 aircraft

USE **XV-4 aircraft**

## V-5 aircraft

USE **XV-5 aircraft**

## V-9 aircraft

USE **XV-9A aircraft**

## V-22 aircraft

(added September 1990)

DEF A Bell/Boeing developed tilt rotor aircraft, nicknamed "Osprey", and designed for light multiservice use. Used for Osprey aircraft.

UF *Osprey aircraft*  
 GS Bell aircraft  
 . **V-22 aircraft**  
 Boeing aircraft  
 . **V-22 aircraft**  
 V/STOL aircraft  
 . rotary wing aircraft  
 . . tilt rotor aircraft  
 . . . **V-22 aircraft**  
 RT  $\infty$  aircraft  
 helicopters  
 $\infty$  military aircraft  
 rotary wings  
 Tilt Rotor Research Aircraft Program  
 tilt wing aircraft  
 tilting rotors

## V/STOL aircraft

DEF A hybrid form of heavier-than-air aircraft that is capable, by virtue of one or more horizontal rotors or units acting as rotors, of taking off, hovering, and landing as, or in a fashion similar to, a helicopter, and once aloft, and moving forward, capable, by means of a mechanical conversion of one sort or another, of flying as a fixed-wing aircraft, especially in its higher speed ranges. Used for convertiplanes and steep gradient aircraft.

UF *convertiplanes*  
*steep gradient aircraft*

GS **V/STOL aircraft**  
 . CL-84 aircraft  
 . DO-31 aircraft  
 . FV-12A aircraft  
 . G-95/4 aircraft  
 . G-222 aircraft  
 . L-29 jet trainer  
 . P-1127 aircraft  
 . P-1154 aircraft  
 . rotary wing aircraft  
 . . autogyros  
 . . Avian 2/180 autogyro  
 . . helicopters  
 . . . Alouette helicopters  
 . . . SA-330 helicopter  
 . . . SE-3160 helicopter  
 . . . Bell 214A helicopter  
 . . . compound helicopters

. . . S-67 helicopter  
 . . H-17 helicopter  
 . . . heavy lift helicopters  
 . . . CH-62 helicopter  
 . . . light helicopters  
 . . . OH-4 helicopter  
 . . . OH-5 helicopter  
 . . . OH-6 helicopter  
 . . . OH-58 helicopter  
 . . . military helicopters  
 . . . AH-1G helicopter  
 . . . AH-1S helicopter  
 . . . AH-1W helicopter  
 . . . AH-63 helicopter  
 . . . AH-64 helicopter  
 . . . BO-105 helicopter  
 . . . CH-3 helicopter  
 . . . CH-21 helicopter  
 . . . CH-34 helicopter  
 . . . CH-46 helicopter  
 . . . CH-47 helicopter  
 . . . CH-54 helicopter  
 . . . CH-62 helicopter  
 . . . H-19 helicopter  
 . . . H-43 helicopter  
 . . . H-53 helicopter  
 . . . H-54 helicopter  
 . . . H-56 helicopter  
 . . . H-60 Helicopter  
 . . . HC-3 helicopter  
 . . . HH-43 helicopter  
 . . . HH-65 helicopter  
 . . . OH-4 helicopter  
 . . . OH-5 helicopter  
 . . . OH-6 helicopter  
 . . . OH-13 helicopter  
 . . . OH-23 helicopter  
 . . . OH-58 helicopter  
 . . . P-531 helicopter  
 . . . QH-50 helicopter  
 . . . S-67 helicopter  
 . . . SA-321 helicopter  
 . . . SA-330 helicopter  
 . . . SH-3 helicopter  
 . . . SH-4 helicopter  
 . . . Sikorsky Whirlwind helicopter  
 . . . UH-1 helicopter  
 . . . UH-2 helicopter  
 . . . UH-34 helicopter  
 . . . UH-60A helicopter  
 . . . UH-61A helicopter  
 . . . Westland Whirlwind helicopter  
 . . . XV-9A aircraft  
 . . . rigid rotor helicopters  
 . . . CH-3 helicopter  
 . . . F-28 helicopter  
 . . . XH-51 helicopter  
 . . . S-58 helicopter  
 . . . S-61 helicopter  
 . . . tandem rotor helicopters  
 . . . CH-46 helicopter  
 . . . CH-47 helicopter  
 . . . H-25 helicopter  
 . . . EH-101 helicopter  
 . . . TH-55 helicopter  
 . . rotor systems research aircraft  
 . . tilt rotor aircraft  
 . . V-22 aircraft  
 . . XV-15 aircraft  
 . . short takeoff aircraft  
 . . Aladin 2 aircraft  
 . . Breguet 940 aircraft  
 . . Breguet 941 aircraft  
 . . C-8A augmentor wing aircraft  
 . . C-15 aircraft  
 . . C-123 aircraft  
 . . DHC 4 aircraft  
 . . DHC 5 aircraft  
 . . Questol aircraft  
 . . U-10 aircraft  
 . . vertical takeoff aircraft  
 . . flying platforms  
 . . SC-1 aircraft  
 . . VJ-101 aircraft  
 . . VZ-8 aircraft  
 . . X-13 aircraft  
 . . X-14 aircraft  
 . . X-19 aircraft

. . X-22 aircraft  
 . . X-22A aircraft  
 . . XC-142 aircraft  
 . . XV-4 aircraft  
 . . XV-11A aircraft  
 . . VZ-2 aircraft  
 . . X-32 aircraft  
 . . X-35 aircraft  
 . . XV-3 aircraft  
 . . XV-5 aircraft  
 . . XV-8A aircraft  
 RT  $\infty$  aircraft  
 antisubmarine warfare aircraft  
 attack aircraft  
 commercial aircraft  
 convertible fan-shaft engines  
 drone aircraft  
 fan in wing aircraft  
 fighter aircraft  
 ground effect machines  
 heliports  
 hovering  
 jet aircraft  
 $\infty$  military aircraft  
 passenger aircraft  
 reconnaissance aircraft  
 research aircraft  
 short haul aircraft  
 STOVL aircraft  
 tilt wing aircraft  
 transition flight  
 transport aircraft  
 utility aircraft  
 vertical flight  
 Weser aircraft  
 Westland aircraft

## vacancies (crystal defects)

DEF Vacant sites in a crystal structure due to the absence of an atom or ion from its normal structural position.

GS defects  
 . crystal defects  
 . . point defects  
 . . . **vacancies (crystal defects)**  
 . . . Frenkel defects

RT antisite defects  
 binding energy  
 holes (electron deficiencies)  
 square wells

## vaccines

GS **vaccines**  
 . inoculum  
 RT acquired immunodeficiency syndrome  
 antibodies  
 antigens  
 antiserums  
 bacteriology  
 biocompatibility  
 diseases  
 drugs  
 epidemiology  
 human immunodeficiency virus  
 inoculation  
 toxicology  
 toxins and antitoxins

## vacillation

RT dithers  
 human reactions

## vacuum

DEF A given space filled with gas at pressures below atmospheric pressure. Used for aspiration.

UF *aspiration*

GS pressure  
 . **vacuum**  
 . . high vacuum  
 . . low vacuum  
 . . ultrahigh vacuum  
 RT aerospace environments  
 boundary layer control  
 evacuating (vacuum)  
 getters  
 high pressure  
 Knudsen flow

- low pressure
- mean free path
- offgassing
- outgassing
- pressure measurement
- rarefaction
- suction
- vacuum apparatus**
  - GS **vacuum apparatus**
    - . vacuum chambers
    - . vacuum furnaces
    - . vacuum gages
    - . . ionization gages
    - . . . alphasatrons
    - . . . Bayard-Alpert ionization gages
    - . . . Penning gages
    - . . . Philips ionization gages
    - . . Knudsen gages
    - . . Mcleod gages
    - . . Pirani gages
    - . vacuum pumps
    - . . condensation pumps
    - . . ion pumps
    - . . molecular pumps
  - RT cold traps
  - diffusion pumps
  - high vacuum
  - low density research
  - residual gas
  - suction
  - ultrahigh vacuum
  - vacuum arc switches
- vacuum arc switches**
  - GS switches
    - . electric switches
    - . . **vacuum arc switches**
  - RT airborne equipment
  - switching circuits
  - vacuum apparatus
  - vacuum effects
- vacuum chambers**
  - UF *low pressure chambers*
  - GS compartments
    - . test chambers
    - . . pressure chambers
    - . . . **vacuum chambers**
  - vacuum apparatus
  - . **vacuum chambers**
  - RT altitude simulation
  - ∞ chambers
    - high altitude environments
    - high altitude pressure
    - hyperbaric chambers
    - pressure
    - space environment simulation
    - space simulators
    - thermal vacuum tests
    - wind tunnel drives
- vacuum deposition**
  - GS deposition
    - . vapor deposition
    - . . **vacuum deposition**
  - RT ceramic coatings
  - diamond films
  - electroless deposition
  - ion plating
- vacuum effects**
  - RT cold welding
  - ∞ effects
    - environments
    - offgassing
    - pressure effects
    - space manufacturing
    - vacuum arc switches
- vacuum furnaces**
  - GS heating equipment
    - . furnaces
    - . . **vacuum furnaces**
  - vacuum apparatus
  - . **vacuum furnaces**
  - RT solar furnaces
- vacuum gages**
  - GS measuring instruments
  - . pressure gages
  - . . **vacuum gages**
    - . . . ionization gages
    - . . . . alphasatrons
    - . . . . Bayard-Alpert ionization gages
    - . . . . Penning gages
    - . . . . Philips ionization gages
    - . . . Knudsen gages
    - . . . Mcleod gages
    - . . . Pirani gages
  - vacuum apparatus
  - . **vacuum gages**
    - . . ionization gages
    - . . . alphasatrons
    - . . . Bayard-Alpert ionization gages
    - . . . Penning gages
    - . . . Philips ionization gages
    - . . Knudsen gages
    - . . Mcleod gages
    - . . Pirani gages
  - RT barometers
  - manometers
  - orbitrons
  - pressure measurement
- vacuum melting**
  - GS phase transformations
    - . melting
    - . . **vacuum melting**
  - RT arc melting
  - induction heating
  - levitation
  - powder metallurgy
  - zone melting
- vacuum pumps**
  - GS pumps
    - . **vacuum pumps**
    - . . condensation pumps
    - . . ion pumps
    - . . molecular pumps
  - vacuum apparatus
  - . **vacuum pumps**
    - . . condensation pumps
    - . . ion pumps
    - . . molecular pumps
  - RT compressors
  - cryopumping
  - diffusion pumps
  - ejectors
  - evacuating (vacuum)
  - jet pumps
  - materials handling
  - outgassing
  - suction
- vacuum spectroscopy**
  - GS spectroscopy
    - . **vacuum spectroscopy**
  - RT gas spectroscopy
  - inductively coupled plasma mass spectrometry
  - infrared spectroscopy
  - magnetic spectroscopy
  - mass spectroscopy
  - molecular spectroscopy
  - nuclear radiation spectroscopy
  - spectroscopic analysis
  - ultraviolet spectroscopy
  - x ray spectroscopy
- vacuum systems**
  - DEF Chambers having walls capable of withstanding atmospheric pressure and having an opening through which the gas can be removed through a pipe or manifold to a pumping system. The pumping system may or may not be considered as part of the vacuum system.
  - RT ampoules
  - ∞ systems
- vacuum tests**
  - GS **vacuum tests**
    - . thermal vacuum tests
  - RT high vacuum
  - hypobaric atmospheres
  - test chambers
  - ∞ tests
- ultrahigh vacuum
- vacuum tube oscillators**
  - GS electron tubes
    - . vacuum tubes
    - . . **vacuum tube oscillators**
  - oscillators
  - . **vacuum tube oscillators**
  - RT autodynes
  - frequency modulation photomultipliers
  - microwave oscillators
- vacuum tubes**
  - DEF Electron tubes evacuated to such a degree that their electrical characteristics are essentially unaffected by the presence of residual gas or vapor.
  - GS electron tubes
    - . **vacuum tubes**
    - . . cathode ray tubes
    - . . . monoscopes
    - . . . picture tubes
    - . . cesium diodes
    - . . microwave tubes
    - . . . celescopes
    - . . . cyclotron resonance devices
    - . . . klystrons
    - . . . magnetrons
    - . . . . nigotrons
    - . . . . planotrons
    - . . . traveling wave tubes
    - . . . . backward wave tubes
    - . . . . . helitrons
    - . . . . . carcinotrons
    - . . vacuum tube oscillators
  - RT pentodes
  - perveance
  - residual gas
- vacuum ultraviolet radiation*
- USE **far ultraviolet radiation**
- vadose water**
  - GS water
    - . **vadose water**
  - RT coastal water
  - evapotranspiration
  - Lake Texoma (OK-TX)
  - nearshore water
  - river basins
  - soils
  - water tables
- valence**
  - DEF numbers representing the combining or displacing power of an atom, number of electrons lost, gained or shared by an atom in a compound, number of hydrogen atoms with which an atom will combine, or which it will displace. The valance of an element is the ratio of the atomic weight to the equivalent weight.
  - GS **valence**
    - . octets
  - RT chemical bonds
  - conduction electrons
  - ion charge
  - ions
  - positive ions
  - quantum wells
  - trivalent ions
- valeric acid**
  - GS acids
    - . carboxylic acids
    - . . fatty acids
    - . . . **valeric acid**
  - organic compounds
  - . carboxylic acids
  - . . fatty acids
  - . . . **valeric acid**
- Valiant aircraft**
  - UF *Vickers Valiant aircraft*
  - GS attack aircraft
    - . bomber aircraft
    - . . **Valiant aircraft**
  - BAC aircraft
  - . **Valiant aircraft**
  - jet aircraft
  - . **Valiant aircraft**

## validity

monoplanes  
· **Valiant aircraft**  
RT ∞ aircraft  
reconnaissance aircraft  
tanker aircraft

### validation

USE **proving**

### validity

RT acceptability  
accuracy  
adequacy  
consistency  
correlation  
existence  
mathematical models  
precision  
quality  
reliability  
simulation  
standards  
statistical tests  
variability

### Valkyrie aircraft

USE **B-70 aircraft**

### valleys

UF *intermontane floors*  
*rift valleys*  
*rills*

#### GS **valleys**

· Coachella Valley (CA)  
· Death Valley (CA)  
· Imperial Valley (CA)  
· Magdalena-Cauca Valley (Colombia)  
· Palo Verde Valley (CA)  
· Potomac River Valley (MD-VA-WV)  
· Sacramento Valley (CA)  
· San Joaquin Valley (CA)  
· Shenandoah Valley (VA)  
· St Lawrence Valley (North America)  
· Tennessee Valley (AL-KY-TN)

#### RT

canyons  
Delaware River Basin (US)  
erosion  
meanders  
Missouri River (US)  
ravines  
rivers  
structural basins  
Susquehanna River Basin  
(MD-NY-PA)  
topography  
wadis  
watersheds

### Valsalva exercise

DEF The procedure of raising the pressure in the nasopharynx by forcible expiration with the mouth closed and nostrils pinched, in order to clear the eustachian tubes. Used for Valsalva maneuver.

UF *Valsalva maneuver*

RT respiration

### Valsalva maneuver

USE **Valsalva exercise**

### value

#### GS **value**

· Q values (nuclear physics)

#### RT

amount  
assessments  
costs  
damage assessment  
estimates  
estimating  
evaluation  
figure of merit  
level (quantity)  
norms  
ranking  
technology assessment

### value engineering

RT concurrent engineering  
cost analysis  
cost estimates

cost incentives  
cost reduction  
design analysis  
economic analysis  
∞ engineering  
incentive techniques  
life cycle costs  
management planning  
quality control  
reliability engineering  
standards  
total quality management

### valves

UF *hydraulic valves*

#### GS **valves**

· automatic control valves  
· pressure regulators  
· relief valves  
· butterfly valves  
· dampers (valves)  
· cocks  
· control valves  
· fuel valves  
· gas valves  
· heart valves  
· artificial heart valves  
· solenoid valves

#### RT

balls  
chokes (restrictions)  
closures  
diverters  
engine parts  
hydraulic equipment  
packings (seals)  
pneumatic circuits  
pneumatic equipment  
seals (stoppers)  
traps  
water hammer

### Vampire aircraft

USE **DH 115 aircraft**

### Vampire MK 35 aircraft

GS attack aircraft  
· fighter aircraft  
· **Vampire MK 35 aircraft**  
Hawker Siddeley aircraft  
· **Vampire MK 35 aircraft**  
jet aircraft  
· **Vampire MK 35 aircraft**  
single engine aircraft  
· **Vampire MK 35 aircraft**  
RT ∞ aircraft  
bomber aircraft  
Harrier aircraft

### Van Allen radiation belts

USE **radiation belts**

### Van Biesbroeck star

GS celestial bodies  
· stars  
· late stars  
· cool stars  
· M stars  
· **Van Biesbroeck star**

### Van de Graaff accelerators

DEF Electrostatic machines in which an electrical charge is carried into the high voltage terminal by a belt made of insulating materials moving at high speed. The particles are then accelerated along a discharge path through a vacuum tube by the potential difference between the insulated terminal and the grounded end of the accelerator.

GS particle accelerators

· **Van de Graaff accelerators**

RT ∞ accelerators

electron accelerators

### Van der Waals forces

RT dipole moments  
∞ force  
interatomic forces

intermolecular forces

### Van Slyke method

GS chemical tests  
· chemical analysis  
· gas analysis  
· **Van Slyke method**  
· quantitative analysis  
· **Van Slyke method**  
RT ∞ methodology

### vanadates

GS vanadium compounds  
· **vanadates**  
· calcium vanadates  
RT metal oxides  
vanadium oxides

### vanadium

GS chemical elements  
· **vanadium**  
· vanadium isotopes  
metals  
· transition metals  
· **vanadium**  
· vanadium isotopes  
RT vanadium alloys

### vanadium alloys

GS alloys  
· **vanadium alloys**  
RT aluminum alloys  
microstructure  
titanium alloys  
vanadium

### vanadium carbides

GS carbon compounds  
· carbides  
· **vanadium carbides**  
vanadium compounds  
· **vanadium carbides**

### vanadium compounds

GS **vanadium compounds**  
· vanadates  
· calcium vanadates  
· vanadium carbides  
· vanadium oxides  
· vanadyl compounds  
RT ∞ chemical compounds  
∞ Group 5B compounds  
∞ metal compounds

### vanadium isotopes

GS chemical elements  
· nuclides  
· isotopes  
· **vanadium isotopes**  
· vanadium  
· **vanadium isotopes**  
metals  
· transition metals  
· vanadium  
· **vanadium isotopes**

### vanadium oxides

GS chalcogenides  
· oxides  
· metal oxides  
· **vanadium oxides**  
vanadium compounds  
· **vanadium oxides**  
RT thermochromic coatings  
vanadates

### vanadyl compounds

GS vanadium compounds  
· **vanadyl compounds**  
RT ∞ chemical compounds  
∞ metal compounds

### vanadyl radical

GS ions  
· molecular ions  
· **vanadyl radical**  
· positive ions  
· cations  
· **vanadyl radical**  
radicals

. **vanadyl radical**

**vaneless diffusers**  
 RT compressors  
 ∞ diffusers  
 exhaust diffusers  
 pumps  
 supersonic diffusers

**vanes**  
 GS **vanes**  
 . guide vanes  
 . jet vanes  
 . wind vanes  
 RT airfoils  
 ∞ blades  
 compressor blades  
 control surfaces  
 fins  
 impellers  
 nose fins  
 stator blades  
 tail assemblies  
 turbomachine blades  
 windpower utilization  
 windpowered generators  
 windpowered pumps

**Vanguard 1 satellite**  
 GS artificial satellites  
 . geodetic satellites  
 . . **Vanguard 1 satellite**  
 . Vanguard satellites  
 . . **Vanguard 1 satellite**

**vanguard 2 launch vehicle**  
 GS launch vehicles  
 . **vanguard 2 launch vehicle**  
 rocket vehicles  
 . multistage rocket vehicles  
 . . **vanguard 2 launch vehicle**  
 RT liquid propellant rocket engines  
 solid propellant rocket engines  
 Viking rocket vehicle  
 X-248 engine

**Vanguard 2 satellite**  
 GS artificial satellites  
 . meteorological satellites  
 . . **Vanguard 2 satellite**  
 . Vanguard satellites  
 . . **Vanguard 2 satellite**

**Vanguard 3 satellite**  
 GS artificial satellites  
 . geophysical satellites  
 . . **Vanguard 3 satellite**  
 . Vanguard satellites  
 . . **Vanguard 3 satellite**

**Vanguard project**  
 GS programs  
 . NASA programs  
 . . NASA space programs  
 . . . **Vanguard project**  
 . projects  
 . . **Vanguard project**  
 . space programs  
 . . NASA space programs  
 . . . **Vanguard project**  
 RT X-405 engine

**Vanguard satellites**  
 GS artificial satellites  
 . **Vanguard satellites**  
 . . Vanguard 1 satellite  
 . . Vanguard 2 satellite  
 . . Vanguard 3 satellite  
 RT geodetic satellites  
 geophysical satellites  
 International Geophysical Year  
 meteorological satellites

**vans**  
 USE **trucks**

**vapor barrier clothing**  
 DEF Impermeable garments used with respirators as life support systems in toxic environments (caustic chemicals, etc.).

GS clothing  
 . protective clothing  
 . . **vapor barrier clothing**  
 RT ∞ barriers  
 life support systems  
 textiles

**vapor deposition**  
 UF *chemical vapor deposition*  
*CVD (deposition)*  
 GS deposition  
 . **vapor deposition**  
 . . metalorganic chemical vapor  
 deposition  
 . . vacuum deposition  
 RT atomic layer epitaxy  
 coating  
 coatings  
 crystal growth  
 diamond films  
 electroless deposition  
 laser deposition  
 metal vapors  
 metallizing  
 nanostructure growth  
 pulsed laser deposition  
 ultrapure metals  
 vaporizers  
 vaporizing

*vapor generators*  
 USE **vaporizers**

**vapor jets**  
 GS fluid jets  
 . **vapor jets**  
 RT air jets  
 gas flow  
 jet flow  
 plasma jets

*vapor liquid equilibrium*  
 USE **liquid-vapor equilibrium**

**vapor phase epitaxy**  
 DEF A crystal growth process whereby an element or a compound is deposited as a thin layer on a slice of substrate single crystal material by the vapor phase technique.  
 GS growth  
 . crystal growth  
 . . epitaxy  
 . . . **vapor phase epitaxy**  
 RT atomic layer epitaxy  
 crystal structure  
 liquid phase epitaxy  
 liquid phases

**vapor phase lubrication**  
*(added August 1996)*  
 DEF The use of an organic liquid that is vaporized into a flowing air stream directed to sliding surfaces where lubrication is needed. The organic vapor reacts at the concentrated contact sliding area generating a lubricous deposit. This deposit has been characterized as a thin polymeric film that can provide effective lubrication temperatures greater than 400 degrees Celsius.

GS lubrication  
 . **vapor phase lubrication**  
 RT boundary lubrication  
 lubrication systems  
 ∞ sliding contact  
 squeeze films  
 tribology

**vapor phases**  
 UF *gas phases*  
 RT association reactions  
 critical pressure  
 gases  
 gas-metal interactions  
 gas-solid interfaces  
 hydrogen clouds  
 liquid phases  
 liquid-gas mixtures  
 liquids  
 liquid-vapor interfaces  
 metal-gas systems

phase diagrams  
 ∞ phases  
 prevaporization  
 solids  
 supercritical pressures  
 vapors  
 volatility

**vapor pressure**  
 DEF The pressure exerted by the molecules of a given vapor. For a pure confined vapor, it is that vapor's pressure on the walls of its containing vessel; and for a vapor mixed with other vapors or gases, it is that vapor's contribution to the total pressure (i.e., its partial pressure).  
 GS pressure  
 . **vapor pressure**  
 thermodynamic properties  
 . thermophysical properties  
 . . **vapor pressure**  
 RT Dalton law  
 flash point  
 fuel tank pressurization  
 Henry law  
 humidity  
 interfacial tension  
 liquid-gas mixtures  
 liquid-vapor interfaces  
 partial pressure  
 Raoult law  
 sublimation  
 supercritical pressures  
 volatility

*vapor trails*  
 USE **contrails**

**vapor traps**  
 GS traps  
 . **vapor traps**  
 RT cold traps  
 getters  
 ion traps (instrumentation)

*vaporization heat*  
 USE **heat of vaporization**

**vaporizers**  
 UF *vapor generators*  
 GS heating equipment  
 . **vaporizers**  
 . . evaporators  
 RT boilers  
 cavity vapor generators  
 colloidal generators  
 columns (process engineering)  
 condensers (liquefiers)  
 gas generators  
 ∞ generators  
 ∞ heaters  
 separators  
 sprayers  
 vapor deposition  
 vaporizing  
 vapors

**vaporizing**  
 UF *volatilization*  
 GS phase transformations  
 . **vaporizing**  
 . . boiling  
 . . . film boiling  
 . . . nucleate boiling  
 . . . . Leidenfrost phenomenon  
 . . evaporation  
 . . . evapotranspiration  
 . . . propellant evaporation  
 . . . transpiration  
 . . flashing (vaporizing)  
 . . prevaporization  
 . . sublimation  
 RT ablation  
 concentrating  
 desalinization  
 distillation  
 evolution (liberation)  
 gasification  
 heat of vaporization  
 heating  
 ∞ separation



## vapors

spraying  
stripping (distillation)  
surface reactions  
vapor deposition  
vaporizers  
vapors  
volatility

### vapors

DEF Gases whose temperatures are below their critical temperatures, so that they can be condensed to the liquid or solid state by increase of pressure alone.

#### GS vapors

. cesium vapor  
. metal vapors  
. . mercury vapor  
. . sodium vapor  
. water vapor

#### RT

cavity vapor generators  
combustion products  
condensates  
exhaust gases  
fumes  
gases  
haze detection  
hydrogen clouds  
liquid-vapor equilibrium  
prevaporization  
smoke  
vapor phases  
vaporizers  
vaporizing

### varactor diode circuits

GS circuits

. **varactor diode circuits**

#### RT

diodes

### varactor diodes

UF *varactors*

GS electronic equipment

. diodes

. . semiconductor diodes

. . . **varactor diodes**

. solid state devices

. . semiconductor devices

. . . **varactor diodes**

#### RT

junction diodes  
parametric diodes  
varistors

### varactors

USE **varactor diodes**

### variability

RT consistency  
continuity  
convergence  
correlation  
covariance  
∞ dispersion  
eccentricity  
∞ equilibrium  
factor analysis  
heterogeneity  
linearity  
nonlinearity  
periodic variations  
quality  
quality control  
range (extremes)  
regression analysis  
reliability  
sampling  
stability  
standard deviation  
standardization  
validity  
∞ variable  
variance (statistics)

### ∞ variable

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

UF *factors*

RT complex variables  
dependent variables  
form factors  
independent variables

Latin square method  
race factors  
random variables  
real variables  
social factors  
variability

### variable amplitude loading

(added September 1993)

GS loads (forces)

. dynamic loads

. . **variable amplitude loading**

#### RT

cyclic loads  
load tests  
∞ loading  
loading rate  
random loads  
stress cycles

### variable area wings

USE **trailing edge flaps**

### variable cycle engines

UF *VCE*

GS engines

. aircraft engines

. . **variable cycle engines**

#### RT

coaxial nozzles  
convertible fan-shaft engines  
supersonic aircraft  
variable stream control engines

### variable geometry structures

RT expandable structures  
folding structures  
inflatable structures  
mission adaptive wings  
∞ structures

### variable lift

USE **lift**

### variable mass systems

GS kinetics

. **variable mass systems**

RT equations of motion

∞ mass balance

mass distribution

∞ systems

### variable pitch propellers

UF *constant speed propellers*

GS propellers

. **variable pitch propellers**

#### RT

helicopter propeller drive  
pitch (inclination)

### Variable Specific Impulse Magnetoplasma Rocket

(added December 2000)

USE **VASIMR (propulsion system)**

### variable stars

GS celestial bodies

. stars

. . **variable stars**

. . . cataclysmic variables

. . . cepheid variables

. . . flare stars

. . . irregular variable stars

. . . R Coronae Borealis stars

. . . Lambda Tauri stars

. . . Mira variables

. . . Omicron Ceti star

. . . novae

. . . dwarf novae

. . . Hercules nova

. . . semiregular variable stars

. . . supernovae

. . . supernova 1987A

. . . symbiotic stars

. . . T Tauri stars

#### RT

binary stars  
companion stars  
eclipsing binary stars  
periodic variations  
solar oscillations  
stellar mass  
stellar mass ejection

stellar oscillations

### variable stream control engines

DEF Advanced, moderate bypass-ratio turbofan configurations that use duct burner thrust augmentation and coannular nozzles for jet noise reduction.

GS engines

. aircraft engines

. . **variable stream control engines**

RT ∞ control

engine control  
supersonic aircraft  
supersonic nozzles  
variable cycle engines

### variable sweep wings

UF *M wings*

*ogee wings*

*W wings*

GS

airfoils

. wings

. . **variable sweep wings**

planforms

. wing planforms

. . **variable sweep wings**

RT

arrow wings  
Boeing 733 aircraft  
delta wings  
F-111 aircraft  
folding structures  
mission adaptive wings  
ogee shape  
swept forward wings  
sweptback wings

### variable thrust

GS thrust

. **variable thrust**

RT

control rockets  
high thrust  
jet control  
jet thrust  
low thrust  
low thrust propulsion  
microthrust  
rocket thrust  
throttling  
thrust augmentation  
thrust control  
thrust termination  
thrust vector control

### ∞ variance

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

DEF A measure of the precision of a measurement based on summing the squares of the deviations from individual determinations from the average and dividing by the degrees of freedom.

RT analysis of variance  
degrees of freedom  
multivariate statistical analysis  
variance (statistics)

### variance (statistics)

GS statistical analysis

. **variance (statistics)**

. . analysis of variance

. . multivariate statistical analysis

. . . bivariate analysis

. . . covariance

. . . orthogonality

. . . regression analysis

. . . regression coefficients

RT

confidence limits  
correlation  
Cramer-Rao bounds  
distribution moments  
experiment design  
factor analysis  
Gauss-Markov theorem  
goodness of fit  
heterogeneity  
homogeneity  
kriging  
mean  
moments

quality control  
range (extremes)  
standard deviation  
variability  
∞ variance

#### variation method

USE **calculus of variations**

#### variational principles

RT calculus of variations  
∞ dynamics  
equilibrium methods  
irreversible processes  
Onsager phenomenological coefficient  
Rayleigh-Ritz method

#### variations

UF *fluctuation*  
GS **variations**  
. magnetic variations  
. . geomagnetic pulsations  
. . . geomagnetic micropulsations  
. . nocturnal variations  
. periodic variations  
. . alternations  
. . annual variations  
. . diurnal variations  
. . intraseasonal variations  
. . nocturnal variations  
. . secular variations  
. . . Madden-Julian Oscillation  
. . quasi-biennial oscillation  
. twenty-seven day variation  
. wind variations  
RT alternatives  
asymmetry  
deflection  
deviation  
differences  
displacement  
distortion  
divergence  
eccentricity  
gradients  
micropulsations  
perturbation  
revisions  
substitutes  
surges

#### variometers

DEF Instruments for comparing magnetic forces, especially of the Earth's magnetic field. Used for magnetovariographs.  
UF *magnetovariographs*  
GS measuring instruments  
. magnetometers  
. . **variometers**  
RT geomagnetism

#### varistors

DEF Two electrode semiconductor devices having a voltage dependent nonlinear resistance.  
GS electronic equipment  
. solid state devices  
. . semiconductor devices  
. . . **varistors**  
RT resistors  
thermistors  
varactor diodes

#### varnishes

RT fillers  
finishes  
paints  
primers (coatings)  
protective coatings  
sealers  
sprayed coatings

#### vascular system

USE **cardiovascular system**

#### VASIMR (propulsion system)

(added November 2000)  
DEF A high-power, RF-driven magneto-plasma rocket system capable of I(sp) thrust modulation at constant power. The VASIMR

utilizes radiofrequency (RF) power both to generate a high-density plasma in a helicon source and to accelerate the plasma ions to high velocity by ion cyclotron resonance heating (ICRH). The system features a magnetic nozzle, which accelerates the plasma particles by converting their azimuthal energy into directed momentum.

UF *Variable Specific Impulse Magnetoplasma Rocket*

GS engines  
. rocket engines  
. . electric rocket engines  
. . . plasma engines  
. . . . **VASIMR (propulsion system)**  
RT magnetic nozzles  
plasma heating  
plasma propulsion  
radio frequency heating  
spacecraft propulsion

#### vasoconstriction

RT angiotensins  
blood vessels  
body temperature  
cold tolerance  
ischemia  
reflexes  
sneezing

#### vasoconstrictor drugs

UF *pressors*  
GS drugs  
. **vasoconstrictor drugs**  
. . hypertension  
. . serotonin  
RT angiotensins  
pharmacology  
vasopressins

#### vasodilation

RT blood vessels  
body temperature  
congestion  
reflexes  
vasodilator agents

#### vasodilator agents

(added August 2004)  
DEF Drugs used to cause dilation of the blood vessels.  
GS drugs  
. **vasodilator agents**  
RT acetylcholine  
blood circulation  
blood vessels  
vasodilation

#### vasomotor nervous system

USE **nervous system**

#### vasopressins

(added August 2004)  
DEF Octapeptide antidiuretic hormones released by the neurohypophysis of all vertebrates (chemical composition varies with species). They control water metabolism and balance by regulating lung, gill, kidney, etc., and water loss, and also contract smooth muscle. They may also be neurotransmitters. Also included are synthetic vasopressin derivatives. Vasopressins are used pharmacologically as renal agents, vasoconstrictor agents, and hemostatics.

GS neurotransmitters  
. **vasopressins**  
organic compounds  
. peptides  
. . **vasopressins**  
secretions  
. endocrine secretions  
. . hormones  
. . . pituitary hormones  
. . . . **vasopressins**

RT diuresis  
hemostatics  
metabolism  
pituitary gland  
renal function

vasoconstrictor drugs

#### Vatican City

GS cities  
. **Vatican City**  
nations  
. **Vatican City**  
RT Europe  
Italy

#### VATOL aircraft

SN (VERTICAL ATTITUDE TAKEOFF AND LANDING AIRCRAFT)  
DEF Vertical attitude takeoff and landing aircraft. Used for vertical attitude takeoff-landing aircraft and XBQM-180A aircraft.  
UF *vertical attitude takeoff-landing aircraft XBQM-180A aircraft*  
RT ∞ aircraft  
delta wings  
remotely piloted vehicles  
vertical landing  
vertical takeoff aircraft

#### VAX computers

GS data processing equipment  
. computers  
. . digital computers  
. . . **VAX computers**  
. . . . VAX-11 series computers  
. . . . . VAX-11/780 computer

#### VAX-11 series computers

GS data processing equipment  
. computers  
. . digital computers  
. . . VAX computers  
. . . . **VAX-11 series computers**  
. . . . . VAX-11/780 computer

#### VAX-11/780 computer

GS data processing equipment  
. computers  
. . digital computers  
. . . VAX computers  
. . . . VAX-11 series computers  
. . . . . **VAX-11/780 computer**

#### VC-10 aircraft

UF *Vickers 1100 aircraft Vickers VC-10 aircraft*  
GS BAC aircraft  
. **VC-10 aircraft**  
commercial aircraft  
. **VC-10 aircraft**  
jet aircraft  
. **VC-10 aircraft**  
monoplanes  
. **VC-10 aircraft**  
passenger aircraft  
. **VC-10 aircraft**  
transport aircraft  
. **VC-10 aircraft**  
RT ∞ aircraft  
cargo aircraft

#### VCE

USE **variable cycle engines**

#### VCO

USE **voltage controlled oscillators**

#### vector analysis

GS analysis (mathematics)  
. calculus  
. . **vector analysis**  
. . . collinearity  
. . . coplanarity  
. . . curl (vectors)  
. . . . vorticity  
. real variables  
. . **vector analysis**  
. . . collinearity  
. . . coplanarity  
. . . curl (vectors)  
. . . . vorticity  
geometry  
. **vector analysis**  
. . collinearity  
. . coplanarity  
. . curl (vectors)

## vector currents

... vorticity  
RT differential equations  
Euler-Cauchy equations  
flux vector splitting  
gradients  
Poynting theorem  
resultants  
stability derivatives

*vector calculus*  
USE **vector spaces**

*vector control*  
USE **directional control**

**vector currents**  
RT current algebra  
parity  
radioactive decay  
superconductivity

**vector dominance model**  
GS models  
. **vector dominance model**  
RT hadrons  
high energy interactions  
nucleons  
photoneutrons  
photoproduction

**vector mesons**  
GS particles  
. elementary particles  
. . bosons  
. . . mesons  
. . . . **vector mesons**  
. . . . . rho-mesons  
. . . . . sigma-mesons  
. . hadrons  
. . . mesons  
. . . . **vector mesons**  
. . . . . rho-mesons  
. . . . . sigma-mesons  
. nuclear particles  
. . bosons  
. . . mesons  
. . . . **vector mesons**  
. . . . . rho-mesons  
. . . . . sigma-mesons

**vector processing (computers)**  
(added July 1989)  
GS data processing  
. **vector processing (computers)**  
RT multiprocessing (computers)  
parallel processing (computers)  
pipelining (computers)

**vector quantization**  
(added June 1989)  
RT coding  
data compression  
digital techniques  
image processing  
vectors (mathematics)  
voice data processing

**vector spaces**  
UF *Grassmann algebra*  
*vector calculus*  
GS algebra  
. **vector spaces**  
. . Banach space  
. . . Hilbert space  
. . . . Sobolev space  
. . matrices (mathematics)  
. . . adjoints  
. . . canonical forms  
. . . eigenvalues  
. . . eigenvectors  
. . . Hessian matrices  
. . . Jordan form  
. . . stiffness matrix  
. . Stokes theorem (vector calculus)  
. . U spin space  
. . vectors (mathematics)  
. . . eigenvectors  
. . . state vectors  
. . . vorticity  
RT analysis (mathematics)

Chaplygin equation  
Hermitian polynomial  
hodographs  
Kakutani theorem  
linear transformations

**vectorcardiography**  
GS bioengineering  
. biometrics  
. . cardiography  
. . . **vectorcardiography**  
RT electrocardiography  
phonocardiography

**vectors (mathematics)**  
DEF Quantities such as force, velocity, or acceleration, which have both magnitude and direction at each point in space, as opposed to scalar which has magnitude only. Such quantities may be represented geometrically by an arrow of length proportional to its magnitude, pointing in the assigned direction.  
GS algebra  
. vector spaces  
. . **vectors (mathematics)**  
. . . eigenvectors  
. . . state vectors  
. . . vorticity  
RT dyadics  
flux vector splitting  
function space  
Schwartz inequality  
vector quantization

**Vega launch vehicle**  
UF *Vega rocket vehicle*  
GS launch vehicles  
. **Vega launch vehicle**  
rocket vehicles  
. multistage rocket vehicles  
. . **Vega launch vehicle**  
RT Atlas D ICBM  
liquid propellant rocket engines

**Vega project**  
RT flyby missions  
Halley's comet  
international cooperation  
U.S.S.R. space program  
Venera satellites  
Venus (planet)

*Vega rocket vehicle*  
USE **Vega launch vehicle**

**Vegard-Kaplan bands**  
GS spectra  
. spectral bands  
. . **Vegard-Kaplan bands**  
RT  $\infty$  bands  
emission spectra  
molecular spectra  
nitrogen

**vegetables**  
GS **vegetables**  
. potatoes  
. spinach  
RT angiosperms  
 $\infty$  food  
leguminous plants  
planting  
seeds

**vegetation**  
GS **vegetation**  
. canopies (vegetation)  
RT bioconversion  
biomass energy production  
Earth resources  
locusts  
normalized difference vegetation index  
oases  
plants (botany)  
rain forests  
resources  
sea grasses

trees (plants)

**vegetation growth**  
GS growth  
. **vegetation growth**  
. . crop growth  
RT agriculture  
biochemistry  
botany  
crop vigor  
ecology  
fertilizers  
gravitropism  
hydroponics  
irrigation  
photosynthetically active radiation  
phytochrome  
plant physiology  
plant roots  
plant stress  
soil moisture  
soil science  
soils  
vegetative index

**vegetative index**  
DEF Linear combinations of spectral band responses in digital count, reflectance factor, or voltage to determine the vigor, greenness and/or biomass of the vegetation. Observations can be made by satelliteborne, aircraftborne, truck mounted, or hand held spectrometers.  
GS ratios  
. indexes (ratios)  
. . **vegetative index**  
. . . leaf area index  
. . . normalized difference vegetation index  
RT AgRISTARS project  
atmospheric attenuation  
atmospheric effects  
atmospheric optics  
atmospheric scattering  
canopies (vegetation)  
color  
correction  
crop identification  
crop inventories  
geographic distribution  
image enhancement  
imaging techniques  
multispectral band scanners  
radiometric correction  
reflectance  
remote sensing  
satellite imagery  
satellite observation  
spectral reflectance  
vegetation growth

**vehicle wheels**  
GS wheels  
. **vehicle wheels**  
. . nose wheels  
RT aircraft tires  
brakes (for arresting motion)  
landing gear  
mechanical drives  
rollers  
shafts (machine elements)  
suspension systems (vehicles)  
tires  
toroidal wheels  
transmissions (machine elements)  
wheel brakes

$\infty$  **vehicles**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
UF *craft*  
*rotating vehicles*  
RT amphibious vehicles  
Arcas rocket vehicles  
Arcon rocket vehicle  
Argo rocket vehicles  
Astrobee rocket vehicles  
Atlas Agena launch vehicles  
Atlas launch vehicles  
automated guideway transit vehicles

- automated mixed traffic vehicles  
Automated Transfer Vehicle  
automated transit vehicles  
automobiles  
∞ ballistic vehicles  
boostglide vehicles  
captured air bubble vehicles  
control configured vehicles  
crawler tractors  
drone vehicles  
electric hybrid vehicles  
electric motor vehicles  
engines  
Europa launch vehicles  
flight test vehicles  
∞ flight vehicles  
ground effect machines  
heavy lift launch vehicles  
HOTOL launch vehicle  
hovering rocket vehicles  
hydroplanes (vehicles)  
hypersonic vehicles  
intraorbit transfer vehicles  
Juno launch vehicles  
Kappa rocket vehicles  
Lambda rocket vehicles  
launch vehicles  
low observable reentry vehicles  
lunar flying vehicles  
lunar roving vehicles  
lunar surface vehicles  
Lunokhod lunar roving vehicles  
magnetic levitation vehicles  
manned lunar surface vehicles  
Mars roving vehicles  
Marsokhod Mars roving vehicles  
∞ military vehicles  
missiles  
motor vehicles  
multiengine vehicles  
multistage rocket vehicles  
Nike rocket vehicles  
Nike-Hydac rocket vehicle  
Nike-Iroquois rocket vehicle  
Nova launch vehicles  
nuclear engine for rocket vehicles  
orbit transfer vehicles  
Ranger lunar landing vehicles  
recoverable launch vehicles  
recovery vehicles  
reentry vehicles  
remotely piloted vehicles  
research vehicles  
reusable launch vehicles  
rocket vehicles  
roving vehicles  
Saturn launch vehicles  
single stage rocket vehicles  
single stage to orbit vehicles  
Skua rocket vehicles  
∞ spacecraft  
Standard Launch Vehicles  
surface effect ships  
surface vehicles  
SWATH (ship)  
tanks (combat vehicles)  
Terminal Configured Vehicle Program  
test vehicles  
Thor launch vehicles  
Thorad launch vehicles  
Titan 4 launch vehicle  
Titan launch vehicles  
tracked vehicles  
tractors  
∞ transport vehicles  
transporter  
underwater vehicles  
unidentified flying objects  
Veronique rocket vehicles  
water vehicles  
∞ winged vehicles
- vehicular tracks**  
RT idlers  
surface vehicles  
suspension systems (vehicles)  
tracked vehicles  
∞ tracks
- treads
- veins**  
GS anatomy  
. circulatory system  
. . . cardiovascular system  
. . . . blood vessels  
. . . . **veins**  
RT arteries  
bifurcation (biology)  
transfusion
- veins (petrology)**  
(added June 2001)  
DEF A relatively thin mass of mineral that fills a crack or joint in a host rock.  
RT inclusions  
meteoritic composition  
mineral deposits  
minerals  
rock intrusions  
rocks
- Vela satellites**  
GS artificial satellites  
. **Vela satellites**  
military spacecraft  
. **Vela satellites**  
RT Fishbowl Operation  
high altitude nuclear detection  
high altitude tests  
nuclear explosions  
nuclear radiation  
post-blast nuclear radiation  
radiation detectors  
radiation measuring instruments  
satellite observation
- velardenite*  
USE **gehlenite**
- velocity**  
DEF Rate of motion. Rate of motion in a straight line is called linear speed, whereas change of direction per unit time is called angular speed. Used for speed.  
UF *speed*  
GS **velocity**  
. acoustic velocity  
. airspeed  
. angular velocity  
. critical velocity  
. escape velocity  
. exhaust velocity  
. flow velocity  
. . solar wind velocity  
. ground speed  
. group velocity  
. high speed  
. hypersonic speed  
. landing speed  
. light speed  
. low speed  
. orbital velocity  
. phase velocity  
. propagation velocity  
. radial velocity  
. relativistic velocity  
. rotor speed  
. solar velocity  
. subsonic speed  
. supersonic speed  
. terminal velocity  
. tip speed  
. transonic speed  
. wind velocity  
. . solar wind velocity  
. impact velocity  
RT acceleration (physics)  
body kinematics  
de Broglie wavelengths  
∞ dynamics  
Fermat principle  
kinematics  
kinetics  
loading rate  
∞ motion  
perceptual time constant  
pressure measurement  
relativistic effects
- solitary waves  
time measurement
- velocity coupling**  
DEF The response of the burning propellant surface to the local velocity which would include both mean flow as well as acoustic velocity (both being parallel to the burning surface).  
RT burning rate  
combustion stability  
coupling  
propellant combustion
- velocity distribution**  
UF *velocity fields*  
*velocity profiles*  
GS distribution (property)  
. **velocity distribution**  
RT circulation distribution  
flow distribution  
flow velocity  
galactic rotation  
Orr-Sommerfeld equations  
Pohlhausen method  
pressure distribution  
shock wave profiles  
three dimensional boundary layer
- velocity errors**  
GS errors  
. **velocity errors**  
RT escape velocity  
orbital velocity  
position errors
- velocity fields*  
USE **velocity distribution**
- velocity measurement**  
UF *anemometry*  
GS mechanical measurement  
. **velocity measurement**  
. . particle image velocimetry  
. . wind velocity measurement  
RT acceleration measurement  
accelerometers  
anemometers  
drag force anemometers  
flow measurement  
flow velocity  
flowmeters  
hot-film anemometers  
hot-wire anemometers  
Hubble constant  
Hubble diagram  
laser anemometers  
laser doppler velocimeters  
∞ measurement  
pitot tubes  
pressure measurement  
radial velocity  
solar wind velocity  
sonic anemometers  
speed indicators  
stroboscopes  
tachometers  
time measurement  
Venturi tubes  
vortex precession
- velocity modulation**  
GS modulation  
. **velocity modulation**  
RT bunching  
cavity resonators  
electron bunching  
electron tubes
- velocity profiles*  
USE **velocity distribution**
- veneers**  
RT coatings  
finishes  
laminates  
masonry
- Venera 2 satellite**  
GS artificial satellites  
. Soviet satellites



- ... Venera 6 satellite
  - ... Venera 7 satellite
  - ... Venera 8 satellite
  - ... Venera 9 satellite
  - ... Venera 10 satellite
  - ... Venera 11 satellite
  - ... Venera 12 satellite
  - RT U.S.S.R. space program
  - Vega project
- Veneziano model**
  - GS models
    - . mathematical models
    - . **Veneziano model**
  - RT elementary particle interactions
- Venezuela**
  - GS nations
    - . **Venezuela**
  - RT South America
- Venn diagrams**
  - GS diagrams
    - . **Venn diagrams**
  - RT analysis (mathematics)
    - geometry
    - mathematical logic
- Venom aircraft*
  - USE **DH 112 aircraft**
- ventilation**
  - RT air conditioning
    - air cooling
    - air filters
    - air flow
    - air intakes
    - air purification
    - blowers
    - comfort
    - cooling
    - cooling systems
    - draft (gas flow)
    - ducts
    - environmental engineering
    - exhaust systems
      - . **Venturi tubes**
    - exhausting
    - life support systems
    - refrigerating
    - temperature
    - temperature control
    - temperature distribution
    - ventilators
    - venting
    - vents
- ventilation fans**
  - RT blowers
    - cooling
    - cooling systems
    - ducted fans
    - fan blades
  - ∞ fans
    - ventilators
- ventilators**
  - RT air ducts
    - air intakes
    - blowers
  - ∞ diffusers
    - exhaust systems
    - ventilation
    - ventilation fans
    - vents
- venting**
  - RT breathing vibration
    - cooling
  - ∞ discharge
    - evacuating (vacuum)
    - exhausting
    - flushing
    - purging
    - releasing
    - relief valves
  - ∞ separation
    - ventilation
- vents
  - ventral sections**
    - RT abdomen
  - vents**
    - GS outlets
      - . **vents**
    - RT annular ducts
      - apertures
      - cavities
      - chimneys
      - cooling systems
      - ducts
      - evacuating (vacuum)
      - exhaust systems
      - flues
      - gates (openings)
      - louvers
      - ∞ nozzles
      - openings
      - ports (openings)
      - relief valves
      - slotted wind tunnels
      - ventilation
      - ventilators
      - venting
      - windows (apertures)
- VentureStar launch vehicle**
  - (added June 1999)
  - DEF Reusable single-stage-to-orbit launch vehicle employing linear aerospike engines, and having a payload capacity roughly equivalent to that of the Space Shuttle; developed in coordination with the X-33 advanced technology demonstrator vehicle.
    - GS aerospace vehicles
      - . aerospace planes
      - . . **VentureStar launch vehicle**
      - maneuverable spacecraft
        - . aerospace planes
        - . . **VentureStar launch vehicle**
      - reentry vehicles
        - . recoverable spacecraft
        - . . reusable spacecraft
        - . . . aerospace planes
        - . . . . **VentureStar launch vehicle**
      - soft landing spacecraft
        - . aerospace planes
        - . . **VentureStar launch vehicle**
    - RT aerospike engines
      - commercial spacecraft
      - X-33 reusable launch vehicle
- Venturi tubes**
  - DEF Short tubes of smaller diameter in the middle than at the ends. When fluids flow through such tubes, the pressure decreases as the diameters become smaller, the amount of decrease being proportional to the speed of flow and the amount of restriction.
    - RT ∞ detectors
      - flow measurement
      - flowmeters
      - gas meters
      - measuring instruments
      - orifices
      - pitot tubes
      - pressure gradients
      - pressure measurement
    - ∞ tubes
      - velocity measurement
- Venus (planet)**
  - GS celestial bodies
    - . planets
      - . . terrestrial planets
      - . . . **Venus (planet)**
  - RT planetary craters
    - Vega project
    - Venera 8 satellite
    - Venera 10 satellite
    - Venera 11 satellite
    - Venera 12 satellite
- Venus atmosphere**
  - GS environments
    - . extraterrestrial environments
    - . . planetary environments
- planetary atmospheres
  - ... **Venus atmosphere**
    - ... Venus clouds
      - RT aerospace environments
        - ionopause
        - planetary ionospheres
        - planetary meteorology
        - Venera 11 satellite
        - Venera 12 satellite
        - Venus orbiting imaging radar (spacecraft)
    - Venus clouds**
      - GS environments
        - . extraterrestrial environments
        - . . planetary environments
        - . . . planetary atmospheres
        - . . . . Venus atmosphere
        - . . . . . **Venus clouds**
      - RT atmospheric models
        - cloud cover
        - cloud physics
      - ∞ clouds
        - greenhouse effect
    - Venus fly trap rocket vehicle**
      - GS rocket vehicles
        - . sounding rockets
        - . . **Venus fly trap rocket vehicle**
      - RT cosmic dust
        - extraterrestrial matter
    - Venus orbiting imaging radar (spacecraft)**
      - DEF A spacecraft also known as VOIR whose mission is to obtain synthetic aperture radar (SAR) images of at least 708 of the surface of Venus as well as information on the gravity field of the planet, nature of its inertial composition and dynamics of its atmosphere and interaction with the solar wind.
        - GS radar
          - . **Venus orbiting imaging radar (spacecraft)**
        - RT Magellan project (NASA)
          - Magellan spacecraft (NASA)
          - synthetic aperture radar
          - Venus atmosphere
          - Venus probes
          - Venus surface
    - Venus probes**
      - GS interplanetary spacecraft
        - . **Venus probes**
        - . . Magellan spacecraft (NASA)
        - . . Mariner 1 space probe
        - . . Mariner 2 space probe
        - . . Mariner 5 space probe
        - . . Mariner 10 space probe
        - . . Pioneer Venus 2 spacecraft
          - . . . Pioneer Venus 2 entry probes
          - . . . . Pioneer Venus 2 night probe
          - . . . . Pioneer Venus 2 sounder probe
        - . . Pioneer Venus 2 transporter bus
        - . . Venera satellites
          - . . . Venera 2 satellite
          - . . . Venera 3 satellite
          - . . . Venera 4 satellite
          - . . . Venera 5 satellite
          - . . . Venera 6 satellite
          - . . . Venera 7 satellite
          - . . . Venera 8 satellite
          - . . . Venera 9 satellite
          - . . . Venera 10 satellite
          - . . . Venera 11 satellite
          - . . . Venera 12 satellite
        - . . Zond 1 space probe
        - . . Zond 3 space probe
        - . . Zond 4 space probe
        - . . Zond 5 space probe
        - . . Zond 6 space probe
        - . . Zond 7 space probe
        - . . Zond 8 space probe
        - unmanned spacecraft
          - . space probes
          - . . **Venus probes**
          - . . . Magellan spacecraft (NASA)
          - . . . Mariner 1 space probe
          - . . . Mariner 2 space probe
          - . . . Mariner 5 space probe
          - . . . Mariner 10 space probe

## Venus radar echoes

- . . . Pioneer Venus 2 spacecraft
- . . . . Pioneer Venus 2 entry probes
- . . . . . Pioneer Venus 2 night probe
- . . . . . Pioneer Venus 2 sounder probe
- . . . . . Pioneer Venus 2 transporter bus
- . . . Venera satellites
- . . . . Venera 2 satellite
- . . . . Venera 3 satellite
- . . . . Venera 4 satellite
- . . . . Venera 5 satellite
- . . . . Venera 6 satellite
- . . . . Venera 7 satellite
- . . . . Venera 8 satellite
- . . . . Venera 9 satellite
- . . . . Venera 10 satellite
- . . . . Venera 11 satellite
- . . . . Venera 12 satellite
- . . . Zond 1 space probe
- . . . Zond 3 space probe
- . . . Zond 4 space probe
- . . . Zond 5 space probe
- . . . Zond 6 space probe
- . . . Zond 7 space probe
- . . . Zond 8 space probe
- RT Magellan project (NASA)
- Mariner program
- Mariner Venus 67 spacecraft
- Mars probes
- outer planets explorers
- Sputnik 5 satellite
- Venus orbiting imaging radar (spacecraft)
- Voyager project

### Venus radar echoes

- GS echoes
- . radar echoes
- . . **Venus radar echoes**

### Venus Radar Mapper

USE **Magellan spacecraft (NASA)**

### Venus Radar Mapper Project

USE **Magellan project (NASA)**

### Venus surface

DEF The surface features and/or composition of the planet Venus.

- GS planetary surfaces
- . **Venus surface**
- RT cloud cover
- extraterrestrial environments
- Magellan project (NASA)
- Magellan spacecraft (NASA)
- planetary craters
- solar system
- ∞ surfaces
- terraforming
- topography
- Venera 11 satellite
- Venera 12 satellite
- Venus orbiting imaging radar (spacecraft)

### verbal communication

- GS communicating
- . **verbal communication**
- . . conversation
- RT acoustics
- languages
- lectures
- phonetics
- telephony
- voice communication
- voice data processing
- words (language)

### verification (proving)

USE **proving**

### vermiculite

DEF An aggregate used in lightweight insulating concrete, formed by heating and expanding a micaceous mineral.

- GS clays
- . **vermiculite**
- minerals
- . **vermiculite**
- RT insulation

- mica
- packaging
- silicates

### Vermont

- GS nations
- . United States
- . . **Vermont**
- RT Lake Champlain Basin (NY-VT)
- St Lawrence Valley (North America)

### Verneuil process

DEF Method of single-crystal growth in which powder is dropped through an oxy-hydrogen flame, falling molten on crystal seed.

- GS growth
- . crystal growth
- . . **Verneuil process**
- RT Czochralski method
- ruby lasers

### Vernier engines

DEF Rocket engines of small thrust used primarily to obtain a fine adjustment in the velocity and trajectory of a rocket vehicle just after the thrust cutoff of the last sustainer engine, and used secondarily to add thrust to a booster or sustainer engine.

- GS engines
- . rocket engines
- . . **Vernier engines**
- . . . control rockets
- . . . SYNCOM apogee engines
- . torpedo engines
- . . **Vernier engines**
- . . . control rockets
- . . . SYNCOM apogee engines
- RT electric rocket engines
- electrostatic engines
- hybrid propellant rocket engines
- internal combustion engines
- launch vehicles
- liquid propellant rocket engines
- MA-2 engine
- MA-3 engine
- MA-5 engine
- microrocket engines
- restartable rocket engines
- solid propellant rocket engines
- thrust vector control

### vernine

USE **guanosines**

### Veronique rocket vehicles

- GS rocket vehicles
- . single stage rocket vehicles
- . . **Veronique rocket vehicles**
- . . . sounding rockets
- . . . **Veronique rocket vehicles**
- RT liquid propellant rocket engines
- ∞ vehicles

### versatility

- RT compatibility
- flexibility

### vertebrae

- GS anatomy
- . musculoskeletal system
- . . bones
- . . . spine
- . . . . **vertebrae**
- RT intervertebral disks
- neck (anatomy)

### vertebral column

USE **spine**

### vertebrates

- GS animals
- . **vertebrates**
- . . amphibia
- . . . frogs
- . . . birds
- . . . . chickens
- . . . . pigeons
- . . . . turkeys
- . . . . waterfowl
- . . . fishes

- . . . schools (fish)
- . . . sharks
- . . . mammals
- . . . bats
- . . . bears
- . . . cats
- . . . cattle
- . . . . calves
- . . . . deer
- . . . . caribous
- . . . . goats
- . . . . horses
- . . . . marine mammals
- . . . . dolphins
- . . . . manatees
- . . . . porpoises
- . . . . seals (animals)
- . . . . whales
- . . . . moles
- . . . . primates
- . . . . apes

- . . . . . chimpanzees
- . . . . . baboons
- . . . . . human beings
- . . . . . monkeys
- . . . . . rodents
- . . . . . guinea pigs
- . . . . . hamsters
- . . . . . mice
- . . . . . . jerboas
- . . . . . . knockout mice
- . . . . . . pocket mice
- . . . . . rabbits
- . . . . . rats
- . . . . . squirrels
- . . . . . . ground squirrels
- . . . . . dogs
- . . . . . sheep
- . . . . . swine
- . . . . . wolves
- . . . . . reptiles
- . . . . . lizards
- . . . . . snakes
- . . . . . turtles

RT homeotherms

### vertical air currents

- UF *updrafts*
- GS fluid flow
- . gas flow
- . . air flow
- . . . air currents
- . . . . **vertical air currents**
- RT atmospheric circulation
- convection clouds
- convection currents
- downbursts
- lee waves
- microbursts (meteorology)
- mixing height
- soaring
- turbulence
- wind (meteorology)
- winds aloft

### vertical attitude takeoff-landing aircraft

USE **VATOL aircraft**

### vertical distribution

- GS distribution (property)
- . spatial distribution
- . . **vertical distribution**
- . . . star distribution
- RT electron distribution
- horizontal distribution
- ion distribution
- pressure distribution
- radiation distribution
- temperature distribution
- wind profiles

### vertical fins

USE **fins**

### vertical flight

- RT balloon flight
- climbing flight
- ∞ flight
- flight paths
- hovering

rocket flight  
 transition flight  
 V/STOL aircraft

**vertical junction solar cells**  
 DEF Solar cells made from wafers on which narrow grooves are formed using a preferential KOH etch. The grooved region is radiation tolerant.  
 GS electric generators  
 . direct power generators  
 . . photoelectric generators  
 . . . photovoltaic cells  
 . . . . solar cells  
 . . . . . **vertical junction solar cells**  
 . solar generators  
 . . solar cells  
 . . . **vertical junction solar cells**  
 electronic equipment  
 . solid state devices  
 . . semiconductor devices  
 . . . photovoltaic cells  
 . . . . solar cells  
 . . . . . **vertical junction solar cells**  
 photoelectric cells  
 . photovoltaic cells  
 . . solar cells  
 . . . **vertical junction solar cells**  
 RT wafers

**vertical landing**  
 UF *vertical takeoff and landing*  
 VTOL  
 GS landing  
 . **vertical landing**  
 RT aircraft landing  
 spacecraft landing  
 STOVL aircraft  
 touchdown  
 VATOL aircraft

**vertical motion**  
 RT falling  
 ∞ motion  
 touchdown

**vertical motion simulators**  
 DEF Vibration machines which produce mechanical oscillations parallel to the vertical axis.  
 GS simulators  
 . vibration simulators  
 . . **vertical motion simulators**  
 RT ∞ motion  
 shakers  
 shock simulators  
 vibratory loads

**vertical orientation**  
 DEF The attitude of an object in reference to a plane which is parallel to the direction of gravity (determined with a plumbline).  
 RT alignment  
 attitude (inclination)  
 directional stability  
 dynamic stability  
 horizontal orientation  
 lateral stability  
 ∞ orientation  
 stabilization

**vertical perception**  
 GS perception  
 . sensory perception  
 . . **vertical perception**  
 RT body sway test  
 gravireceptors  
 oculogravic illusions  
 ∞ orientation  
 otolith organs  
 ∞ space orientation  
 vestibular tests

*vertical stabilizers*  
 USE **stabilizers (fluid dynamics)**

*vertical tails*  
 USE **stabilizers (fluid dynamics)**  
**tail assemblies**

**vertical takeoff**  
 UF *vertical takeoff and landing*

VTOL  
 GS takeoff  
 . **vertical takeoff**

**vertical takeoff aircraft**  
 UF *VTOL aircraft*  
 GS V/STOL aircraft  
 . **vertical takeoff aircraft**  
 . . flying platforms  
 . . SC-1 aircraft  
 . . VJ-101 aircraft  
 . . VZ-8 aircraft  
 . . X-13 aircraft  
 . . X-14 aircraft  
 . . X-19 aircraft  
 . . X-22 aircraft  
 . . X-22A aircraft  
 . . XC-142 aircraft  
 . . XV-4 aircraft  
 . . XV-11A aircraft

RT ∞ aircraft  
 Bell 214A helicopter  
 CF-700 engine  
 circulation control rotors  
 compound helicopters  
 convertible fan-shaft engines  
 Cushioncraft ground effect machine  
 fan in wing aircraft  
 GETOL aircraft  
 helicopters  
 lift fans  
 lifting rotors  
 ∞ military aircraft  
 powered lift aircraft  
 research aircraft  
 rotary wing aircraft  
 short takeoff aircraft  
 ∞ subsonic aircraft  
 T-58 engine  
 tilt wing aircraft  
 VATOL aircraft  
 ∞ winged vehicles

*vertical takeoff and landing*  
 USE **vertical landing**  
**vertical takeoff**

*vertices*  
 USE **apexes**

**vertigo**  
 DEF The sensation that the outer world is revolving about the person (objective vertigo) or that he himself is moving in space (subjective vertigo). The word frequently is used erroneously as a synonym for dizziness or giddiness to indicate an unpleasant sensation of disturbed relations to surrounding objects in space.  
 GS signs and symptoms  
 . **vertigo**  
 RT Barany chair  
 ear pressure test  
 vestibular tests

**Vertikal rockets**  
*(added August 1995)*  
 GS rocket vehicles  
 . sounding rockets  
 . . **Vertikal rockets**  
 RT rocket sounding  
 Russian Space Program

*Vertol military helicopters*  
 USE **Boeing aircraft**

**very high frequencies**  
 SN (30 TO 300 MHZ)  
 GS frequencies  
 . radio frequencies  
 . . **very high frequencies**  
 . . . P band  
 RT decametric waves  
 low frequencies  
 maximum usable frequency

**very high frequency radio equipment**  
 UF *ultra short wave radio equipment*  
 GS radio equipment  
 . **very high frequency radio equipment**

RT radio astronomy  
 ultrahigh frequencies

*very high speed integrated circuits*  
 USE **VHSIC (circuits)**

**Very Large Array (VLA)**  
 DEF A synthetic aperture radio telescope, consisting of 27 parabolic antennas each of which is 25 meters in diameter. The system when connected together is capable of arcsecond resolution with high sensitivity resulting in the world's most powerful radio telescope. Operated by the National Radio Astronomy Observatory, it is located in Socorro, New Mexico.  
 GS radio equipment  
 . radio telescopes  
 . . **Very Large Array (VLA)**  
 telescopes  
 . radio telescopes  
 . . **Very Large Array (VLA)**  
 RT antenna arrays  
 radio astronomy

**very large scale integration**  
 DEF A very complex integrated circuit, which contains ten thousand or more individual devices, such as basic logic gates and transistors, placed on a single semiconductor chip. Used for VLSI.  
 UF *VLSI*  
 GS circuits  
 . integrated circuits  
 . . **very large scale integration**  
 microelectronics  
 . **very large scale integration**  
 application specific integrated circuits  
 architecture (computers)  
 chips (electronics)  
 hardware description languages  
 large scale integration  
 molecular electronics  
 RISC processors  
 systolic arrays

**very large transport aircraft**  
*(added November 1998)*  
 DEF Aircraft capable of a maximum takeoff weight greater than 400 metric tons (881,600 lbs) or having a seating capacity greater than 660.  
 UF *VLTA (aircraft)*  
 GS transport aircraft  
 . **very large transport aircraft**  
 RT cargo aircraft  
 passenger aircraft

**very long base interferometry**  
 DEF The simultaneous observation of radio sources by two radio telescopes spaced very far apart to enhance angular resolution. The signals are recorded on magnetic tapes and combined electronically on a computer. Used for VLBI.  
 UF *VLBI*  
 GS interferometry  
 . **very long base interferometry**  
 RT astronomical interferometry  
 diffraction patterns  
 etalons  
 interferometers  
 null zones  
 Quasat  
 radio astronomy  
 radio interferometers  
 Very Long Baseline Array (VLBA)

**Very Long Baseline Array (VLBA)**  
 DEF A transcontinental radio telescope, being developed by the National Radio Astronomy Observatory, to consist of ten dedicated and automated 25-meter (82 foot) diameter antennas distributed from Hawaii to St. Croix, Virgin Islands.  
 GS radio equipment  
 . radio telescopes  
 . . **Very Long Baseline Array (VLBA)**  
 telescopes  
 . radio telescopes



## very low frequencies

. . **Very Long Baseline Array (VLBA)**  
RT antenna arrays  
radio astronomy  
very long base interferometry

**very low frequencies**  
SN (3 TO 30 KHZ)  
GS frequencies  
. radio frequencies  
. . low frequencies  
. . . **very low frequencies**  
RT audio frequencies  
Earth-ionosphere waveguide

*very small aperture terminals*  
USE **VSAT (network)**

∞ **vessels**  
SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT blood vessels  
∞ capsules  
fluid filled shells  
liquid filled shells  
navy  
pressure vessels  
ships

**Vesta asteroid**  
GS celestial bodies  
. asteroids  
. . **Vesta asteroid**  
RT asteroid belts  
meteoroids  
solar system  
space debris

**vestibular nystagmus**  
GS eye movements  
. nystagmus  
. . **vestibular nystagmus**  
reflexes  
. **vestibular nystagmus**  
RT anatomy  
eye (anatomy)  
ophthalmology

**vestibular tests**  
GS physiological tests  
. **vestibular tests**  
RT body sway test  
Coriolis effect  
ear pressure test  
head down tilt  
head movement  
vertical perception  
vertigo

**vestibules**  
GS anatomy  
. sense organs  
. . ear  
. . . labyrinth  
. . . . **vestibules**  
RT morphology  
passageways  
semicircular canals

**vests**  
RT clothing  
garments

**veterinary medicine**  
DEF The branch of medical practice dealing with the treatment of diseases and injuries of animals.  
GS medical science  
. **veterinary medicine**  
RT ∞ biology  
diagnosis  
diseases  
epidemiology  
immunology  
injuries  
∞ medicine  
pathology  
pharmacology

surgery

*VFR (rules)*  
USE **visual flight rules**

*VHDL (computers)*  
USE **hardware description languages**

**VHF omnirange navigation**  
UF *omnirange navigation*  
*VOR systems*  
GS navigation  
. radio navigation  
. . **VHF omnirange navigation**  
RT air navigation  
navigation aids  
radio direction finders  
solar compasses

**VHSIC (circuits)**  
DEF Chips being developed by a DOD program to provide high speed MIL spec VLSI device for use in military systems. Used for very high speed integrated circuits.  
UF *very high speed integrated circuits*  
GS circuits  
. integrated circuits  
. . **VHSIC (circuits)**  
RT chips (electronics)  
large scale integration  
signal processing

**viability**  
RT animals  
carbon cycle  
crop vigor  
germination  
growth  
plants (botany)  
seeds

**vibration**  
DEF Motion due to a continuous change in the magnitude of a given force which reverses its direction with time. Motion of an oscillating body during one complete cycle; two oscillations. Used for jitter.  
UF *jitter*  
GS **vibration**  
. combustion vibration  
. forced vibration  
. free vibration  
. lattice vibrations  
. POGO effects  
. random vibration  
. resonant vibration  
. structural vibration  
. . bending vibration  
. . breathing vibration  
. . flutter  
. . . panel flutter  
. . . subsonic flutter  
. . . supersonic flutter  
. . . transonic flutter  
. . linear vibration  
. . missile vibration  
. . self induced vibration  
. . . panel flutter  
. . . subsonic flutter  
. . . supersonic flutter  
. . . transonic flutter  
. . torsional vibration  
RT acoustics  
airfoil oscillations  
amplitudes  
antinodes  
compacting  
cyclic loads  
displacement  
∞ dynamics  
elastic waves  
fatigue (materials)  
flapping  
harmonics  
isolators  
mechanical oscillators  
mechanical shock  
mistuning (turbomachinery)  
modes (standing waves)  
∞ motion

nodes (standing waves)  
nutation  
oscillating cylinders  
oscillations  
oscillators  
resonance  
shaking  
shock resistance  
spacecraft motion  
standing waves  
vibrational stress  
vibratory loads  
vibratory polishing  
∞ waves  
wing oscillations

*vibration dampers*  
USE **vibration isolators**

**vibration damping**  
GS damping  
. **vibration damping**  
RT acoustics  
attenuation  
DAST program  
elastic damping  
flexible spacecraft  
gyrodampers  
harmonic control  
magnetic damping  
magnetorheological fluids  
molecular relaxation  
nonoscillatory action  
nonstabilized oscillation  
piezoelectric actuators  
shock absorbers  
smart materials

**vibration effects**  
GS **vibration effects**  
. POGO effects  
RT ∞ effects  
support interference  
vibrational stress

**vibration isolators**  
DEF Resilient supports that tend to isolate systems from steady state excitation. Used for vibration dampers and vibration protection.  
UF *vibration dampers*  
*vibration protection*  
GS isolators  
. **vibration isolators**  
RT ∞ absorbers  
acoustic retrofitting  
cushions  
∞ dampers  
dampers (valves)  
damping  
energy absorption  
noise reduction  
oscillation dampers  
shock absorbers  
springs (elastic)  
suspension systems (vehicles)

**vibration measurement**  
GS mechanical measurement  
. **vibration measurement**  
RT cepstral analysis  
damping tests  
frequency analyzers  
frequency measurement  
∞ measurement  
stress measurement

**vibration meters**  
UF *vibrometers*  
GS measuring instruments  
. **vibration meters**  
. . seismographs  
. . . lunar seismographs  
RT accelerometers  
transducers

**vibration mode**  
DEF In a system undergoing vibration, a characteristic pattern assumed by the system in which the motion of every particle is simple

harmonic with the same frequency. Used for mode of vibration.

- UF *mode of vibration*
- GS modes
  - . **vibration mode**
  - . . uncoupled modes
- RT airfoil oscillations
  - free vibration
  - linear vibration
  - mode transformers
  - transverse waves

#### vibration perception

- GS perception
  - . sensory perception
  - . . **vibration perception**

*vibration protection*

- USE **vibration isolators**

#### vibration simulators

- UF *vibration testing machines*
- GS simulators
  - . **vibration simulators**
  - . . vertical motion simulators
- RT flutter
  - ∞ machinery
  - shakers
  - shock simulators
  - vibratory loads

*vibration testing machines*

- USE **vibration simulators**

#### vibration tests

- GS **vibration tests**
  - . damping tests
  - . . stroking tests
- RT destructive tests
  - dynamic tests
  - electronic equipment tests
  - engine tests
  - environmental tests
  - flight tests
  - flutter
  - mechanical engineering
  - oscillations
  - resonance testing
  - shock tests
  - stability tests
  - static tests
  - structural vibration
  - ∞ tests

#### vibrational freezing

- GS phase transformations
  - . freezing
  - . . **vibrational freezing**

*vibrational frequencies (molecular)*

- USE **vibrational spectra**

*vibrational frequencies (structural)*

- USE **resonant frequencies**

*vibrational relaxation*

- USE **molecular relaxation**

#### vibrational spectra

- UF *vibrational frequencies (molecular)*
- GS molecular properties
  - . molecular spectra
  - . . **vibrational spectra**
  - spectra
    - . molecular spectra
    - . . **vibrational spectra**
    - . radiation spectra
    - . . electromagnetic spectra
    - . . . **vibrational spectra**
- RT electronic spectra
  - energy spectra
  - molecular relaxation
  - Raman spectra
  - rotational spectra
  - vibrational states

#### vibrational states

(added December 1993)

- SN (LIMITED TO MOLECULAR ENERGY LEVELS - EXCLUDES VIBRATION

MODES/CONDITIONS OF STRUCTURES

- OR VEHICLES)
- GS level (quantity)
  - . energy levels
  - . . molecular energy levels
  - . . . **vibrational states**
  - molecular properties
  - . molecular energy levels
  - . . **vibrational states**
- RT molecular excitation
  - vibrational spectra

#### vibrational stress

- GS stresses
  - . **vibrational stress**
- RT flutter
  - vibration
  - vibration effects
  - vibratory loads

#### vibratory loads

- GS loads (forces)
  - . dynamic loads
  - . . **vibratory loads**
- RT aerodynamic loads
  - cyclic loads
  - structural design criteria
  - vertical motion simulators
  - vibration
  - vibration simulators
  - vibrational stress

#### vibratory polishing

- GS polishing
  - . **vibratory polishing**
- RT metallography
  - vibration

*vibrocardiography*

- USE **phonocardiography**

*vibrometers*

- USE **vibration meters**

*VIC method*

- USE **vortex in cell technique**

*Vickers 1100 aircraft*

- USE **VC-10 aircraft**

#### Vickers hardness

(added October 2001)

DEF The hardness of a material as determined by the Vickers hardness test, which interprets the degree of penetration made by a load-variable diamond pyramid stylus.

- UF *diamond pyramid hardness*
- GS mechanical properties
  - . hardness
  - . . **Vickers hardness**
- RT hardness tests

*Vickers Scimitar aircraft*

- USE **Scimitar aircraft**

*Vickers Valiant aircraft*

- USE **Valiant aircraft**

*Vickers VC-10 aircraft*

- USE **VC-10 aircraft**

#### Victor MK-1 aircraft

- GS attack aircraft
  - . bomber aircraft
  - . . **Victor MK-1 aircraft**
  - Handley Page aircraft
  - . **Victor MK-1 aircraft**
  - jet aircraft
  - . **Victor MK-1 aircraft**
  - monoplanes
  - . **Victor MK-1 aircraft**
  - reconnaissance aircraft
  - . **Victor MK-1 aircraft**
- RT ∞ aircraft

#### video communication

- GS telecommunication
  - . **video communication**
  - . . video conferencing
- RT high definition television
  - multimedia

television systems  
video signals

#### video compression

(added September 1993)

- UF *compressed video*
- GS data compression
  - . **video compression**
- RT analog data
  - digital data
  - digital television
  - discrete cosine transform
  - image motion compensation
  - image processing
  - signal encoding
  - video conferencing
  - video data
  - video signals

#### video conferencing

(added August 2000)

- UF *video teleconferencing*
- GS telecommunication
  - . teleconferencing
  - . . **video conferencing**
  - . video communication
  - . . **video conferencing**
- RT communication networks
  - conferences
  - television systems
  - video compression
  - video data

#### video data

- RT analog data
- ∞ data
  - data converters
  - data transmission
  - digital data
  - display devices
  - high definition television
  - multimedia
  - radar data
  - smear
  - telecommunication
  - television systems
  - video compression
  - video conferencing
  - video disks
  - video signals

#### video disks

DEF Disks, usually the size of long-playing stereo records, which store video data. The data is recorded by one of two techniques: the capacitance method, in which the disk has spiral grooves and is read by a contact stylus, and the optical method, which uses lasers in both the recording and playback of the data.

- GS documents
  - . records
  - . . **video disks**
- RT data recorders
  - data recording
  - data storage
  - disks (shapes)
  - magnetic disks
  - memory (computers)
  - optical data storage materials
  - optical disks
  - optical memory (data storage)
  - playbacks
  - video data
  - video equipment

#### video equipment

- GS **video equipment**
  - . picture tubes
  - . video tape recorders
- RT Advanced Vidicon Camera System (AVCS)
  - audio visual equipment
  - camera tubes
  - cathode ray tubes
  - compensators
  - digital cameras
  - display devices
  - flying spot scanners
  - motion pictures
  - optical equipment

## video landmark acquisition and tracking

- oscilloscopes
- recording heads
- television equipment
- video disks
- vidicons

### video landmark acquisition and tracking

DEF Shuttle era system for earth-feature identification, acquisition, and tracking.

GS tracking (position)  
. **video landmark acquisition and tracking**

RT avionics  
image correlators  
map matching guidance  
scene analysis  
signatures  
TERCOM  
terrain analysis  
tracking filters

### video signals

DEF Signals with a bandwidth of over 20 kilohertz.

RT signal processing  
signal transmission  
∞ signals  
video communication  
video compression  
video data

### video tape recorders

(added January 1990)

GS recording instruments  
. tape recorders  
. . **video tape recorders**  
video equipment  
. **video tape recorders**

RT multimedia  
video tapes

### video tapes

(added April 1989)

RT audio tapes  
cinematography  
∞ films  
information  
magnetic tapes  
motion pictures  
multimedia  
photographs  
photography  
∞ tapes  
video tape recorders  
visual aids

### video teleconferencing

(added August 2000)

USE **video conferencing**

### vidicons

DEF Television pickup tubes utilizing photo-conductors as the sensing elements.

GS electron tubes  
. camera tubes  
. . **vidicons**  
. . . return beam vidicons  
. . . thermicons

RT Advanced Vidicon Camera System (AVCS)  
fiber optics  
pixels  
video equipment

### Vietnam

UF *North Vietnam*  
*Republic of Vietnam*  
*South Vietnam*

GS nations  
. **Vietnam**

RT Asia  
Southeast Asia

### view effects

SN (LIMITED TO EFFECTS OF CHANGE IN ANGULAR SIZE OF FIELD OF VIEW UPON RECEPTORS OF RADIATION)

DEF Effects of change in angular size of field of view upon receptors of radiation.

RT angular correlation  
∞ effects

- radiant flux density
- radiation measuring instruments
- radiative heat transfer
- viewing

### viewing

GS **viewing**  
. field of view  
RT display devices  
periscopes  
view effects  
visibility  
vision

### Vigilante aircraft

USE **A-5 aircraft**

### vignetting

RT defects  
focusing  
lenses

### Viking 1 spacecraft

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . **Viking 1 spacecraft**  
. . . . Viking lander 1  
. . . . Viking orbiter 1  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . **Viking 1 spacecraft**  
. . . . . Viking lander 1  
. . . . . Viking orbiter 1

RT interplanetary trajectories  
space exploration  
space flight

### Viking 2 spacecraft

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . **Viking 2 spacecraft**  
. . . . Viking lander 2  
. . . . Viking orbiter 2  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . **Viking 2 spacecraft**  
. . . . . Viking lander 2  
. . . . . Viking orbiter 2

RT interplanetary trajectories  
space exploration  
space flight

### Viking 1975 entry vehicle

GS interplanetary spacecraft  
. Mars probes  
. . **Viking 1975 entry vehicle**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . **Viking 1975 entry vehicle**

RT Mars landing  
soft landing

### Viking lander 1

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . Viking 1 spacecraft  
. . . . **Viking lander 1**  
. . . . . Viking lander spacecraft  
. . . . . **Viking lander 1**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . Viking 1 spacecraft  
. . . . . **Viking lander 1**  
. . . . . Viking lander spacecraft  
. . . . . **Viking lander 1**

RT interplanetary trajectories  
Mars surface samples  
space exploration

- space flight

### Viking lander 2

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . Viking 2 spacecraft  
. . . . **Viking lander 2**  
. . . . . Viking lander spacecraft  
. . . . . **Viking lander 2**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . Viking 2 spacecraft  
. . . . . **Viking lander 2**  
. . . . . Viking lander spacecraft  
. . . . . **Viking lander 2**  
RT interplanetary trajectories  
Mars surface samples  
space exploration  
space flight

### Viking lander spacecraft

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . **Viking lander spacecraft**  
. . . . Viking lander 1  
. . . . Viking lander 2  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . **Viking lander spacecraft**  
. . . . . Viking lander 1  
. . . . . Viking lander 2  
RT interplanetary trajectories  
space exploration  
space flight

### Viking Mars program

GS programs  
. NASA programs  
. . NASA space programs  
. . . **Viking Mars program**  
. . . . space programs  
. . . . . NASA space programs  
. . . . . **Viking Mars program**  
RT space exploration  
Viking spacecraft

### Viking orbiter 1

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . Viking 1 spacecraft  
. . . . **Viking orbiter 1**  
. . . . . Viking orbiter spacecraft  
. . . . . **Viking orbiter 1**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . Viking 1 spacecraft  
. . . . . **Viking orbiter 1**  
. . . . . Viking orbiter spacecraft  
. . . . . **Viking orbiter 1**  
RT interplanetary trajectories  
space exploration  
space flight  
∞ spacecraft

### Viking orbiter 2

GS interplanetary spacecraft  
. Mars probes  
. . Viking spacecraft  
. . . Viking 2 spacecraft  
. . . . **Viking orbiter 2**  
. . . . . Viking orbiter spacecraft  
. . . . . **Viking orbiter 2**  
unmanned spacecraft  
. space probes  
. . Mars probes  
. . . Viking spacecraft  
. . . . Viking 2 spacecraft  
. . . . . **Viking orbiter 2**  
. . . . . Viking orbiter spacecraft  
. . . . . **Viking orbiter 2**  
RT interplanetary trajectories

- space exploration
- space flight
- ∞ spacecraft
- Viking orbiter 1975**
  - GS interplanetary spacecraft
    - . Mars probes
    - . . Viking spacecraft
    - . . . Viking orbiter spacecraft
    - . . . . **Viking orbiter 1975**
  - unmanned spacecraft
    - . space probes
    - . . Mars probes
    - . . . Viking spacecraft
    - . . . . Viking orbiter spacecraft
    - . . . . . **Viking orbiter 1975**
- Viking orbiter spacecraft**
  - GS interplanetary spacecraft
    - . Mars probes
    - . . Viking spacecraft
    - . . . **Viking orbiter spacecraft**
    - . . . . Viking orbiter 1
    - . . . . . Viking orbiter 2
    - . . . . . Viking orbiter 1975
  - unmanned spacecraft
    - . space probes
    - . . Mars probes
    - . . . Viking spacecraft
    - . . . . **Viking orbiter spacecraft**
    - . . . . . Viking orbiter 1
    - . . . . . . Viking orbiter 2
    - . . . . . . . Viking orbiter 1975
  - RT interplanetary trajectories
    - planetary orbits
    - space exploration
    - space flight
  - ∞ spacecraft
- Viking rocket vehicle**
  - GS rocket vehicles
    - . single stage rocket vehicles
    - . . **Viking rocket vehicle**
  - RT liquid propellant rocket engines
    - sounding rockets
    - vanguard 2 launch vehicle
- Viking spacecraft**
  - DEF A collective term for the composite Viking orbiter-lander space vehicle.
  - GS interplanetary spacecraft
    - . Mars probes
    - . . **Viking spacecraft**
    - . . . Viking 1 spacecraft
    - . . . . Viking lander 1
    - . . . . . Viking orbiter 1
    - . . . . . Viking 2 spacecraft
    - . . . . . Viking lander 2
    - . . . . . Viking orbiter 2
    - . . . . . Viking lander spacecraft
    - . . . . . . Viking lander 1
    - . . . . . . . Viking lander 2
    - . . . . . . . Viking orbiter spacecraft
    - . . . . . . . . Viking orbiter 1
    - . . . . . . . . . Viking orbiter 2
    - . . . . . . . . . . Viking orbiter 1975
  - unmanned spacecraft
    - . space probes
    - . . Mars probes
    - . . . **Viking spacecraft**
    - . . . . Viking 1 spacecraft
    - . . . . . Viking lander 1
    - . . . . . . Viking orbiter 1
    - . . . . . . . Viking 2 spacecraft
    - . . . . . . . . Viking lander 2
    - . . . . . . . . . Viking orbiter 2
    - . . . . . . . . . . Viking lander spacecraft
    - . . . . . . . . . . . Viking lander 1
    - . . . . . . . . . . . . Viking lander 2
    - . . . . . . . . . . . . . Viking orbiter spacecraft
    - . . . . . . . . . . . . . . Viking orbiter 1
    - . . . . . . . . . . . . . . . Viking orbiter 2
    - . . . . . . . . . . . . . . . . Viking orbiter 1975
  - RT Viking Mars program
- vineyards**
  - RT agriculture
    - blight
    - botany
    - crop growth
- crop vigor
- ∞ crops
- Earth resources
- farm crops
- ∞ food
- irrigation
- plants (botany)
- wines
- vinti theory**
  - GS perturbation theory
    - . **vinti theory**
  - RT geodesy
    - orbit perturbation
  - ∞ theories
- vinyl copolymers**
  - GS copolymers
    - . **vinyl copolymers**
    - plastics
      - . synthetic resins
      - . . addition resins
      - . . . **vinyl copolymers**
    - resins
      - . synthetic resins
      - . . addition resins
      - . . . **vinyl copolymers**
  - vinyl polymers
    - . **vinyl copolymers**
  - RT additives
    - copolymerization
  - ∞ polymers
- vinyl cyanide*
  - USE **acrylonitriles**
- vinyl ethylene*
  - USE **butadiene**
- vinyl polymers**
  - GS **vinyl polymers**
    - . polymethyl methacrylate
    - . polystyrene
    - . polyvinyl chloride
    - . polyvinyl fluoride
    - . vinyl copolymers
    - . . styrofoam (trademark)
    - . polyvinyl alcohol
    - . vinylidene
  - RT ∞ polymers
- vinyl radical**
  - GS radicals
    - . **vinyl radical**
  - RT free radicals
- vinylidene**
  - UF *polyvinylidene*
  - GS organic compounds
    - . hydrocarbons
      - . . aliphatic hydrocarbons
      - . . . alkenes
      - . . . . ethylene
      - . . . . . **vinylidene**
    - vinyl polymers
      - . **vinylidene**
- violence**
  - GS **violence**
    - . attacking (assaulting)
  - RT crime
    - disorders
    - police
    - terrorism
    - warfare
- viral diseases**
  - SN (EXCLUDES PLANT DISEASES)
  - GS diseases
    - . infectious diseases
    - . . **viral diseases**
    - . . . acquired immunodeficiency syndrome
      - . . . . influenza
      - . . . . . poliomyelitis
      - . . . . . smallpox
  - RT encephalitis
    - hepatitis
    - human immunodeficiency virus
    - meningitis
- pneumonia
- viruses
- Virgin Islands**
  - GS landforms
    - . islands
      - . . West Indies
      - . . . **Virgin Islands**
    - nations
      - . United States
      - . . **Virgin Islands**
  - RT archipelagoes
    - Caribbean region
    - Caribbean Sea
    - tropical regions
- Virginia**
  - GS nations
    - . United States
    - . . **Virginia**
  - RT Allegheny Plateau (US)
    - Assateague Island (MD-VA)
    - Chesapeake Bay (US)
    - Delmarva Peninsula (DE-MD-VA)
    - Potomac River Valley (MD-VA-WV)
    - Shenandoah Valley (VA)
    - Wallops Island
- Virgo galactic cluster**
  - DEF A cluster of galaxies nearest to the Milky Way Galaxy, centered in the constellation Virgo and about 16 million light-years from Earth. Used for Virgo star cluster.
  - UF *Virgo star cluster*
  - GS celestial bodies
    - . galactic clusters
      - . . **Virgo galactic cluster**
      - . . . galaxies
      - . . . . **Virgo galactic cluster**
  - RT agglomeration
    - barred galaxies
    - ∞ clusters
      - . disk galaxies
      - . elliptical galaxies
      - . local group (astronomy)
      - . spiral galaxies
      - . star clusters
      - . star distribution
      - . stars
- Virgo star cluster*
  - USE **Virgo galactic cluster**
- virial coefficients**
  - GS coefficients
    - . **virial coefficients**
  - RT equations of state
    - intermolecular forces
    - virial theorem
- virial theorem**
  - GS theorems
    - . **virial theorem**
  - RT kinetic energy
    - kinetic equations
    - missing mass (astrophysics)
    - statistical mechanics
    - virial coefficients
- virtual memory systems**
  - RT computer systems design
    - data management
    - data storage
    - magnetic storage
- virtual properties**
  - RT accuracy
    - ∞ physical properties
    - ∞ properties
- virtual reality**
  - (added February 1992)
  - DEF An artificial reality that projects the user into a three dimensional space generated by the computer.
  - UF *VR (virtual reality)*
  - RT cockpit simulators
    - computerized simulation
    - environment simulation
    - flight simulation

## virulence

human-computer interface  
man machine systems  
motion simulation  
simulation  
space environment simulation  
training simulators

### virulence

RT biological weapons  
human immunodeficiency virus  
microorganisms  
toxicity  
viruses

### viruses

GS microorganisms  
. **viruses**  
. . adenoviruses  
. . bacteriophages  
. . human immunodeficiency virus  
RT biological weapons  
∞ blisters  
interferon  
protobiology  
viral diseases  
virulence

### viscera

SN (FOR SPECIFIC ORGANS SEE ANATOMY)  
GS organs  
. **viscera**  
RT abdomen  
anatomy  
peritoneum  
thorax

### viscoelastic cylinders

RT ∞ cylinders  
cylindrical bodies  
cylindrical shells

### viscoelastic damping

DEF The absorption of oscillatory motions by materials which are viscous while exhibiting certain elastic properties.

GS damping  
. elastic damping  
. . **viscoelastic damping**  
. viscous damping  
. . **viscoelastic damping**  
elastodynamics  
. elastic damping  
. . **viscoelastic damping**

### viscoelastic flow

USE **viscoelasticity**

### viscoelasticity

DEF Property of materials that strain under stress partly elastically and partly viscously, that is, whose strain is partly dependent on time and magnitude of stress. Used for viscoelastic flow.

UF *viscoelastic flow*  
GS mechanical properties  
. elastic properties  
. . **viscoelasticity**  
. . . photoviscoelasticity  
. . . thermoviscoelasticity  
RT hydroelasticity  
hysteresis  
Maxwell fluids  
nonNewtonian flow  
nonNewtonian fluids  
plastic flow  
relaxation (mechanics)  
shear thinning  
squeeze films  
viscoplasticity  
viscous damping

### viscometers

GS measuring instruments  
. **viscometers**  
RT rotating cylinders  
viscometry  
viscosity

### viscometry

RT rotating cylinders  
viscometers

viscosity  
viscous drag  
viscous flow

### viscoplastic flow

USE **viscoplasticity**

### viscoplasticity

UF *viscoplastic flow*  
GS mechanical properties  
. plastic properties  
. . **viscoplasticity**  
RT hysteresis  
nonNewtonian flow  
nonNewtonian fluids  
plastic anisotropy  
plastic flow  
relaxation (mechanics)  
viscoelasticity  
viscous damping

### viscopumps

GS pumps  
. **viscopumps**  
RT viscous flow

### viscosity

DEF That molecular property of a fluid which enables it to support tangential stresses for a finite time and thus to resist deformation; the ratio of shear stress divided by shearing strain.

GS transport properties  
. **viscosity**  
. . eddy viscosity  
. . gas viscosity  
RT density (mass/volume)  
flow characteristics  
flow resistance  
internal friction  
low Reynolds number  
∞ motion  
∞ physical properties  
rheology  
shear thinning  
similitude law  
solubility  
Stokes law (fluid mechanics)  
superfluidity  
surface properties  
thermal diffusion  
thermal diffusivity  
thixotropy  
viscometers  
viscometry  
viscous flow

### Viscount aircraft

GS BAC aircraft  
. **Viscount aircraft**  
jet aircraft  
. turboprop aircraft  
. . **Viscount aircraft**  
monoplanes  
. **Viscount aircraft**  
passenger aircraft  
. **Viscount aircraft**  
transport aircraft  
. **Viscount aircraft**  
RT ∞ aircraft

### viscous damping

DEF The dissipation of energy that occurs when a particle in a vibrating system is resisted by a force that has a magnitude proportional to the magnitude of the velocity of the particle and direction opposite to the direction of the particle.

GS damping  
. **viscous damping**  
. . viscoelastic damping  
RT elastic damping  
resonance testing  
viscoelasticity  
viscoplasticity

### viscous drag

GS dynamic characteristics  
. drag  
. . friction drag  
. . . **viscous drag**

friction  
. flow resistance  
. . friction drag  
. . . **viscous drag**  
. skin friction  
. . friction drag  
. . . **viscous drag**  
RT eddy viscosity  
Hartmann number  
laminar flow  
turbulent flow  
viscometry

### viscous flow

DEF The flow of a fluid through a duct under conditions such that the mean free path is very small in comparison with the smallest dimensions of a transverse section of the duct. This flow may be either laminar or turbulent.

GS fluid flow  
. **viscous flow**  
. . boundary layer flow  
. . . reattached flow  
. . . secondary flow  
. . . separated flow  
. . . . boundary layer separation  
. Couette flow  
. Karman-Bodewadt flow  
. Stokes flow  
RT aerodynamics  
barotropic flow  
Brinkman number  
eddy viscosity  
∞ flow  
flow characteristics  
gas flow  
inviscid flow  
Knudsen flow  
laminar flow  
magneto hydrodynamic shear heating  
Maxwell fluids  
Milne-Thomson method  
Navier-Stokes equation  
Pohlhausen method  
Prandtl number  
Reynolds number  
turbulent flow  
viscometry  
viscopumps  
viscosity  
wedge flow

### viscous fluids

DEF Fluids whose molecular viscosity is sufficiently large to make the viscous forces a significant part of the total force field in the fluid.

RT flow stability  
∞ fluids  
Maxwell fluids  
Navier-Stokes equation  
Newtonian fluids  
nonNewtonian fluids  
. . Oseen approximation  
semisolids  
squeeze films  
weightless fluids

### visibility

UF *invisibility*  
GS **visibility**  
. low visibility  
RT appearance  
brightness  
ceilings (meteorology)  
character recognition  
color  
contrast  
darkening  
enhanced vision  
fog  
glare  
haze  
human factors engineering  
illuminance  
image contrast  
legibility  
light (visible radiation)  
light transmission  
luminescence  
luminosity

night flights (aircraft)  
opacity  
optical properties  
perception  
radiance  
reading  
resolution  
retinal adaptation  
sensitivity  
smoke  
symbols  
transmissivity  
viewing  
vision  
visual control  
visual observation  
whiteout

**visible infrared spin scan radiometer**

DEF A radiometer used for satellite sound-  
ing of the atmosphere.

GS measuring instruments  
. radiation measuring instruments  
. . actinometers  
. . . radiometers  
. . . . infrared detectors  
. . . . . infrared radiometers  
. . . . . **visible infrared spin scan  
radiometer**  
. . infrared instruments  
. . . infrared detectors  
. . . . infrared radiometers  
. . . . . **visible infrared spin scan  
radiometer**

RT atmospheric sounding  
satellite sounding  
satellite-borne instruments

*visible radiation*

USE **light (visible radiation)**

**visible spectrum**

DEF The range of wavelengths of visible  
radiation; display or graph of the intensity of  
visible radiation emitted or absorbed by a mate-  
rial as a function of wavelength or some related  
parameter.

GS spectra  
. radiation spectra  
. . electromagnetic spectra  
. . . **visible spectrum**

RT ∞ absorption  
absorption spectra  
astronomical spectroscopy  
auroral spectroscopy  
cathodoluminescence  
emission spectra  
gas spectroscopy  
light (visible radiation)  
line spectra  
molecular spectra  
solar spectra  
spectral bands  
spectroscopy  
stellar spectra

**vision**

UF *macular vision*

GS **vision**  
. binocular vision  
. color vision  
. enhanced vision  
. monocular vision  
. night vision  
. peripheral vision  
. stereoscopic vision

RT adaptation  
anastigmatism  
blindness  
brightness  
choroid membranes  
color  
conjunctiva  
contrast  
cornea  
dark adaptation  
eye (anatomy)  
eye dominance  
flash blindness  
glare

heterophoria  
human factors engineering  
hyperopia  
illusions  
images  
legibility  
light adaptation  
miosis  
myopia  
oculomotor nerves  
ophthalmodynamometry  
optometry  
perception  
phosphene  
presbyopia  
pupils  
resolution  
retina  
retinal adaptation  
retinal images  
thresholds (perception)  
viewing  
visibility  
visual acuity

**visors**

RT eye protection  
radiation protection  
sunglasses

**visual accommodation**

RT accommodation

**visual acuity**

DEF Keeness of perception and sharpness  
of vision.

GS acuity  
. **visual acuity**  
. . hyperopia

RT peripheral vision  
Snellen tests  
vision

**visual aids**

RT ∞ aids  
audio visual equipment  
audio visual material  
charts  
diagrams  
display devices  
drawings  
multimedia  
photographs  
training devices  
video tapes

**visual control**

GS manual control  
. **visual control**

RT aircraft control  
approach control  
attitude control  
∞ control  
display devices  
guidance (motion)  
missile control  
remote control  
runway lights  
servocontrol  
spacecraft control  
visibility

**visual discrimination**

GS discrimination  
. sensory discrimination  
. . **visual discrimination**  
perception  
. sensory perception  
. . visual perception  
. . . **visual discrimination**

RT ∞ recovery

*visual displays*

USE **display devices**

**visual fields**

RT field of view  
∞ fields  
peripheral vision  
retina

retinal images  
Saccadic eye movements  
space perception

**visual flight**

RT air navigation  
collision avoidance  
∞ flight  
flight conditions  
flight paths  
flight safety  
landing  
whiteout

**visual flight rules**

UF *VFR (rules)*  
GS rules  
. flight rules  
. . **visual flight rules**

**visual observation**

GS observation  
. **visual observation**

RT optical tracking  
surveillance  
visibility  
visual perception  
visual tasks

**visual perception**

UF *sight*  
GS perception  
. sensory perception  
. . **visual perception**  
. . . critical flicker fusion  
. . . space perception  
. . . . autokinesis  
. . . visual discrimination

RT afterimages  
blinking  
brightness discrimination  
elevator illusion  
motion perception  
∞ orientation  
perceptual errors  
∞ space orientation  
tachistoscopes  
thresholds (perception)  
visual observation  
visual tasks

**visual photometry**

DEF A subjective approach to the problem  
of photometry, wherein the human eye is used  
as the sensing instrument; to be distinguished  
from photoelectric photometry.

GS optical measurement  
. photometry  
. . **visual photometry**

**visual pigments**

GS pigments  
. **visual pigments**

RT dark adaptation  
photoreceptors  
photosensitivity  
retina

**visual signals**

RT beacons  
cues  
luminaires  
optical communication  
∞ signals

**visual stimuli**

RT perceptual errors  
∞ signals  
∞ stimuli  
visual tasks  
zeitgebers

**visual tasks**

GS tasks  
. **visual tasks**

RT eye movements  
human performance  
visual observation  
visual perception

## vitamins

visual stimuli  
*visual tracking*  
USE **optical tracking**

*visualization of flow*  
USE **flow visualization**

*vitamin A*  
USE **retinene**

*vitamin B*  
USE **thiamine**

*vitamin B 2*  
USE **riboflavin**

*vitamin B 6*  
USE **pyridoxine**

*vitamin B 12*  
USE **cyanocobalamin**

*vitamin B complex*  
USE **biotin**

*vitamin C*  
USE **ascorbic acid**

*vitamin D*  
USE **calciferol**

*vitamin E*  
USE **tocopherol**

*vitamin G*  
USE **riboflavin**

*vitamin K*  
USE **phylloquinone**

*vitamin M*  
USE **folic acid**

*vitamin P*  
USE **bioflavonoids**

**vitamins**  
GS **vitamins**  
. ascorbic acid  
. bioflavonoids  
. biotin  
. calciferol  
. carnitine  
. cyanocobalamin  
. folic acid  
. nicotinamide  
. nicotinic acid  
. phylloquinone  
. pyridoxine  
. retinene  
. riboflavin  
. thiamine  
. tocopherol  
RT ascorbic acid metabolism  
choline  
drugs  
∞ food  
∞ nutrients

**Viterbi decoders**  
GS decoders  
. **Viterbi decoders**  
RT coding  
decoding  
signal encoding  
signal processing

**Viton rubber (trademark)**  
GS copolymers  
. **Viton rubber (trademark)**  
elastomers  
. rubber  
. . . synthetic rubbers  
. . . **Viton rubber (trademark)**  
RT fluorohydrocarbons

**vitreous materials**  
RT frit  
glass  
∞ inorganic materials  
∞ materials

metallic glasses  
porcelain  
vitrification

**vitrification**  
DEF Formation of a glassy or noncrystalline material.  
RT ceramics  
glass  
porcelain  
solidification  
vitreous materials

**VJ-101 aircraft**  
GS jet aircraft  
. **VJ-101 aircraft**  
monoplanes  
. **VJ-101 aircraft**  
single engine aircraft  
. **VJ-101 aircraft**  
supersonic aircraft  
. **VJ-101 aircraft**  
V/STOL aircraft  
. vertical takeoff aircraft  
. . **VJ-101 aircraft**  
RT ∞ aircraft

**vlasov equations**  
GS analysis (mathematics)  
. real variables  
. . differential equations  
. . . partial differential equations  
. . . . **vlasov equations**  
RT ∞ equations  
stability

**VLBI**  
USE **very long base interferometry**

**VLF emission recorders**  
RT atmospheric radiation  
atmospherics  
cosmic rays  
electromagnetic radiation  
planetary radiation  
∞ recorders  
recording instruments

**VLSI**  
USE **very large scale integration**

**VLTA (aircraft)**  
(added November 1998)  
USE **very large transport aircraft**

**VOC (organic chemistry)**  
(added March 2000)  
USE **volatile organic compounds**

**vocal cords**  
GS anatomy  
. respiratory system  
. . larynx  
. . . **vocal cords**  
RT glottis

**vocoders**  
RT bandpass filters  
computers  
digital to voice translators  
frequency modulation  
messages  
radio communication  
scrambling (communication)  
signal reception  
speech baseband compression  
voice communication  
voice data processing

**voice**  
RT audio frequencies  
speech  
tongue

**voice communication**  
GS telecommunication  
. communication  
. . **voice communication**  
. . . telephony  
RT acoustics  
conversation

echo suppressors  
ground-air-ground communication  
multimedia  
radio communication  
radiotelephones  
reentry communication  
scrambling (communication)  
single channel per carrier  
transmission  
single sideband transmission  
speech  
speech baseband compression  
verbal communication  
vocoders  
voice control  
voice data processing  
wireless communication  
words (language)

**voice control**  
SN (DEVICE OPERATION BY VOICE)  
DEF Using the voice to activate devices which respond or operate by means of speech recognition. SN (device operation by voice).  
RT bioengineering  
∞ control  
robotics  
robots  
speech recognition  
voice communication  
voice data processing

**voice data processing**  
GS data processing  
. **voice data processing**  
. . cepstral analysis  
RT artificial intelligence  
∞ data  
digital to voice translators  
signal encoding  
single channel per carrier  
transmission  
vector quantization  
verbal communication  
vocoders  
voice communication  
voice control

**Voice of America**  
RT broadcasting  
radio transmission

**void ratio**  
UF *compactness*  
GS ratios  
. **void ratio**  
RT ∞ conductivity  
density (mass/volume)  
free flow  
hole distribution (mechanics)  
packing density  
permeability  
porosity  
reactor cores  
surface properties  
voids

**voids**  
RT buoyancy  
cavities  
crack geometry  
crack opening displacement  
defects  
inclusions  
infiltration  
interstices  
percolation  
permeability  
porosity  
void ratio

**Voigt effect**  
RT birefringence  
∞ effects  
optical paths  
refraction  
Zeeman effect

**volatile organic compounds**  
(added March 2000)

DEF Any compounds of carbon (excluding carbon oxides, carbonic acid, metallic carbonates and carbides, and carbon-nitrogen compounds) that are readily vaporizable; any of such compounds that participate in atmospheric photochemical reactions, or that are considered indoor, local, regional, or global contaminants.

UF *VOC (organic chemistry)*

GS organic compounds  
. **volatile organic compounds**

RT air pollution  
air quality  
contaminants  
exhaust emission  
indoor air pollution  
ozone  
photochemical reactions

**volatility**

GS thermodynamic properties  
. thermophysical properties  
. . **volatility**

RT coal gasification  
evaporation  
flash point  
prevaporization  
vapor phases  
vapor pressure  
vaporizing

*volatilization*

USE **vaporizing**

**volcanic eruptions**

(added October 2001)

DEF The sudden ejection of solid, liquid, or gaseous matter from a volcanic vent or fissure.

UF *eruptions (volcanology)*

RT calderas  
effluents  
lava  
magma  
submarine hydrothermal vents  
volcanoes  
volcanology

*volcanics*

USE **volcanology**

**volcanoes**

DEF Naturally occurring vents or fissures at the Earth's surface through which erupt molten, solid, and gaseous materials.

UF *active volcanoes*

GS geology  
. **volcanoes**  
. . Mars volcanoes  
landforms  
. **volcanoes**  
. . Mars volcanoes

RT basalt  
calderas  
cones (volcanoes)  
effusives  
geomorphology  
geothermal resources  
lava  
mountains  
orography  
paleomagnetism  
petrology  
Rouse belts  
volcanic eruptions  
volcanology

**volcanology**

UF *volcanics*

GS geology  
. **volcanology**

RT basalt  
calderas  
cones (volcanoes)  
effusives  
geomorphology  
lava  
Mars volcanoes  
mountains  
orography  
paleomagnetism  
petrogenesis

petrology  
Rouse belts  
volcanic eruptions  
volcanoes

*voltage*

USE **electric potential**

**voltage amplifiers**

GS amplifiers  
. **voltage amplifiers**

RT current amplifiers  
feedback amplifiers  
magnetic amplifiers  
preamplifiers  
volt-ampere characteristics

*voltage breakdown*

USE **electrical faults**

**voltage controlled oscillators**

DEF An oscillator whose frequency of oscillation can be varied by changing an applied voltage. Used for VCO.

UF *VCO*

GS oscillators  
. **voltage controlled oscillators**

RT circuits  
electric control  
electric networks  
frequency modulation  
frequency stability  
microwave oscillators  
voltage regulators

**voltage converters (AC to AC)**

GS transformers  
. **voltage converters (AC to AC)**

RT alternating current  
auxiliary power sources  
∞ converters  
∞ electric equipment  
∞ electric power  
∞ power supplies

**voltage converters (DC to DC)**

RT auxiliary power sources  
∞ converters  
direct current  
electric batteries  
∞ electric equipment  
∞ electric power  
∞ power supplies  
power supply circuits

**voltage generators**

RT arc generators  
electrostatic generators  
function generators  
∞ generators  
signal generators

*voltage measurement*

USE **electrical measurement**

**voltage regulators**

GS control equipment  
. regulators  
. . **voltage regulators**

RT avalanche diodes  
circuit protection  
controllers  
current regulators  
electric switches  
electronic control  
power factor controllers  
power supply circuits  
switching circuits  
transformers  
transmission loss  
voltage controlled oscillators

*voltage variation indicators*

USE **voltmeters**

**volt-ampere characteristics**

RT capacitance-voltage characteristics  
∞ characteristics  
electric current  
electric potential  
∞ electronics

linear circuits  
Ohms law  
open circuit voltage  
optogalvanic spectroscopy  
proximity effect (electricity)  
quantum efficiency  
short circuit currents  
threshold voltage  
transconductance  
voltage amplifiers

**Volterra equations**

GS analysis (mathematics)  
. functional analysis  
. . integral equations  
. . . **Volterra equations**  
RT ∞ equations  
nonlinearity  
∞ radiation

**voltmeters**

UF *voltage variation indicators*  
GS measuring instruments  
. **voltmeters**  
. . millivoltmeters  
RT ammeters  
coulometers  
electrometers  
potentiometers (instruments)

**volume**

GS **volume**  
. body volume (biology)  
RT area  
∞ capacity  
dimensions  
frustums  
geometry  
isochoric processes  
rates (per time)  
thickness  
volumetric analysis  
weight (mass)

*volume fraction*

USE **concentration (composition)**

**volumetric analysis**

GS chemical tests  
. chemical analysis  
. . **volumetric analysis**  
RT analytical chemistry  
gas analysis  
quantitative analysis  
volume

**volumetric efficiency**

RT energy conversion efficiency  
engine design  
fuel-air ratio  
laser outputs

**volumetric strain**

GS fatigue (materials)  
. **volumetric strain**  
RT deformation  
structural strain  
temperature inversions

*voluntary muscle*

(added December 2004)

USE **skeletal muscle**

**vomiting**

RT motion sickness  
nausea

**Von Karman equation**

GS flow equations  
. **Von Karman equation**  
RT ∞ equations  
flow stability  
Karman vortex street  
vortex breakdown  
vortex streets



## von Zeipel method

vorticity equations

*von Mises theory*

USE **stress functions**

### von Zeipel method

RT equations of motion  
Hamiltonian functions  
∞ methodology  
perturbation theory

*Voodoo aircraft*

USE **F-101 aircraft**

*VOR systems*

USE **VHF omnirange navigation**

### Voronoi diagrams

(added October 2000)

DEF In computational geometry, a partitioning of a space containing a finite set of points, P, in such a way that each partition contains a single point in P and the subspace for which it is the nearest point from the set. Some applications include regional planning, image analysis, and robot path planning.

GS diagrams

. **Voronoi diagrams**

RT computational geometry  
geometry  
grid generation (mathematics)  
image analysis  
partitions (mathematics)  
spatial distribution  
topology  
trajectory planning

### vortex advisory system

DEF Display system which compares measured on-minute-average wind magnitudes and direction with the wind-rose criterion to predict wake vorticity and to indicate to the air traffic controller (with a red or green light) when the interarrival spacings for landings may be reduced to the 3 nautical mile limit.

RT air traffic control  
aircraft approach spacing  
aircraft wakes

∞ systems  
turbulent wakes  
vortex alleviation

### vortex alleviation

DEF The alteration of airfoil configurations to change the airflow patterns directly behind the wings to eliminate or inhibit the vertical motion which directly affects the aircraft immediately following, during closely spaced landings.

RT aircraft wakes  
drag devices  
gust alleviators  
protuberances  
riblets  
spoilers  
vortex advisory system  
vortices  
wakes  
winglets

### vortex avoidance

DEF Schemes which involve airborne or ground-based equipment to track, monitor, and/or predict vortex behavior which might affect the approach and landing operations.

GS avoidance

. **vortex avoidance**

RT aerodynamic stability  
air traffic control  
aircraft approach spacing  
aircraft landing  
buffeting  
gusts  
rotation  
safety  
turbulent flow  
vortices  
winglets

### vortex breakdown

RT flow stability

turbulent flow

Von Karman equation

vortex flaps

*vortex columns*

USE **vortices**

*vortex disturbances*

USE **vortices**

### vortex filaments

DEF The fine-scale structure of turbulent flow; the small non energy containing eddies convected at mean freestream velocities.

RT ∞ filaments  
flow stability  
fluid dynamics  
horseshoe vortices  
turbulence  
vortex in cell technique  
vortices

### vortex flaps

DEF Leading edge flap designs for highly swept wings, in which the leading edge tabs, which are counter reflected, cause vortices to form on the flap. The trapped vortices cause significantly improved wind flow characteristics.

GS airfoils  
. flaps (control surfaces)  
. . wing flaps  
. . . **vortex flaps**  
brakes (for arresting motion)  
. aerodynamic brakes  
. . wing flaps  
. . . **vortex flaps**  
. aircraft brakes  
. . wing flaps  
. . . **vortex flaps**  
control surfaces  
. flaps (control surfaces)  
. . wing flaps  
. . . **vortex flaps**  
drag devices  
. aerodynamic brakes  
. . wing flaps  
. . . **vortex flaps**

RT aerodynamic drag  
jet flaps  
leading edge flaps  
leading edges  
lift augmentation  
separated flow  
trailing edge flaps  
trailing edges  
vortex breakdown  
vortices  
wing loading

*vortex flow*

USE **vortices**

*vortex generation*

USE **vortex generators**

### vortex generators

UF *vortex generation*  
RT airfoil fences  
boundary layer control  
boundary layer separation  
∞ generators  
Hilsch tubes  
horseshoe vortices  
inlet flow  
vortices  
wing slots

### vortex in cell technique

(added April 1993)

UF *VIC method*  
GS analysis (mathematics)  
. numerical analysis  
. . approximation  
. . . **vortex in cell technique**  
RT computational fluid dynamics  
fast Fourier transformations  
finite difference theory  
∞ methodology  
particle in cell technique  
Poisson equation

vortex filaments

vortices

### vortex injectors

GS injectors  
. **vortex injectors**

### vortex lattice method

(added April 1992)

RT boundary conditions  
computational fluid dynamics  
flow velocity  
flux vector splitting  
lattices (mathematics)  
panel method (fluid dynamics)  
vortices

### vortex precession

RT flow velocity  
flowmeters  
precession  
velocity measurement  
vortices

### vortex rings

RT horseshoe vortices  
∞ rings  
trapped vortices  
vortices

### vortex shedding

DEF Periodic separation of a fluid flowing past an unstreamlined body.  
GS mechanics (physics)  
. fluid mechanics  
. . fluid dynamics  
. . . **vortex shedding**  
RT shedding  
vortices

### vortex sheets

RT aircraft design  
flow distribution  
rotating fluids  
∞ sheets  
turbulent wakes  
vortices  
vorticity

### vortex streets

DEF Two parallel rows of alternately placed vortices along the wake of an obstacle in a fluid of moderate Reynolds number.  
GS **vortex streets**  
. Karman vortex street  
RT discontinuity  
∞ sheets  
turbulent wakes  
Von Karman equation  
vortices

*vortex traps*

USE **trapped vortices**

*vortex tubes*

USE **Hilsch tubes**  
**vortices**

*vortex-blade interaction*

USE **blade-vortex interaction**

### vortices

DEF In fluids, circulations drawing their energy from flows of much larger scale and brought about by pressure irregularities. Used for eddies, rotational flow, vortex columns, vortex disturbances, vortex flow, and vortex tubes.

UF *eddies*  
*rotational flow*  
*vortex columns*  
*vortex disturbances*  
*vortex flow*  
*vortex tubes*

GS **vortices**  
. horseshoe vortices  
. trapped vortices  
. wing tip vortices

RT Abrikosov theory  
agitation  
Biot-Savart law  
blade-vortex interaction

- cavitation flow
- counterflow
- ∞ disturbances
- divergence
- flow distortion
- flow stability
- fluid flow
- Goertler instability
- Hilsch tubes
- Kolmogorov theory
- large eddy simulation
- meteorological solenoids
- mixing
- planetary waves
- recirculative fluid flow
- rotating fluids
- rotating liquids
- rotation
- secondary flow
- Strouhal number
- superconductivity
- superfluidity
- thrust distribution
- turbulence
- turbulent flow
- turbulent mixing
- vortex alleviation
- vortex avoidance
- vortex filaments
- vortex flaps
- vortex generators
- vortex in cell technique
- vortex lattice method
- vortex precession
- vortex rings
- vortex shedding
- vortex sheets
- vortex streets
- vorticity
- wakes

**vorticity**

- UF *enstrophy*
- GS algebra
  - . vector spaces
  - . vectors (mathematics)
  - . . . **vorticity**
  - analysis (mathematics)
    - . calculus
    - . vector analysis
    - . . . curl (vectors)
    - . . . . **vorticity**
    - . real variables
    - . vector analysis
    - . . . curl (vectors)
    - . . . . **vorticity**
  - geometry
    - . vector analysis
    - . . curl (vectors)
    - . . . . **vorticity**
- RT atmospheric circulation
  - Beltrami flow
  - Crocco method
  - flow stability
  - Helmholtz vorticity equation
  - horseshoe vortices
  - potential flow
  - secondary flow
  - trapped vortices
  - turbulence
  - vortex sheets
  - vortices

**vorticity equations**

- DEF Dynamic equations for the rate of change on the vorticity of a parcel, obtained by taking the curl of the vector equation of motion.
- GS analysis (mathematics)
  - . real variables
  - . differential equations
  - . . . **vorticity equations**
  - . . . . Helmholtz vorticity equation
  - flow equations
    - . **vorticity equations**
    - . . Helmholtz vorticity equation
- RT ∞ equations
  - Karman vortex street

Von Karman equation

**vorticity transport hypothesis**

- GS hypotheses
  - . **vorticity transport hypothesis**
- RT conservation equations
  - eddy currents
  - mixing length flow theory
  - turbulent flow

**Voskhod 1 spacecraft**

- GS manned spacecraft
  - . voskhod manned spacecraft
  - . . **Voskhod 1 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . voskhod manned spacecraft
    - . . . **Voskhod 1 spacecraft**
  - soft landing spacecraft
    - . voskhod manned spacecraft
    - . . **Voskhod 1 spacecraft**

**Voskhod 2 spacecraft**

- GS manned spacecraft
  - . voskhod manned spacecraft
  - . . **Voskhod 2 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . voskhod manned spacecraft
    - . . . **Voskhod 2 spacecraft**
  - soft landing spacecraft
    - . voskhod manned spacecraft
    - . . **Voskhod 2 spacecraft**

**voskhod manned spacecraft**

- GS manned spacecraft
  - . **voskhod manned spacecraft**
  - . . Voskhod 1 spacecraft
  - . . Voskhod 2 spacecraft
  - reentry vehicles
    - . recoverable spacecraft
    - . . **voskhod manned spacecraft**
    - . . . Voskhod 1 spacecraft
    - . . . Voskhod 2 spacecraft
  - soft landing spacecraft
    - . **voskhod manned spacecraft**
    - . . Voskhod 1 spacecraft
    - . . Voskhod 2 spacecraft
- RT space capsules

**Vostok 1 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 1 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . Vostok spacecraft
    - . . . **Vostok 1 spacecraft**
  - soft landing spacecraft
    - . Vostok spacecraft
    - . . **Vostok 1 spacecraft**

**Vostok 2 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 2 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . Vostok spacecraft
    - . . . **Vostok 2 spacecraft**
  - soft landing spacecraft
    - . Vostok spacecraft
    - . . **Vostok 2 spacecraft**

**Vostok 3 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 3 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . Vostok spacecraft
    - . . . **Vostok 3 spacecraft**
  - soft landing spacecraft
    - . Vostok spacecraft
    - . . **Vostok 3 spacecraft**

**Vostok 4 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 4 spacecraft**

- reentry vehicles
  - . recoverable spacecraft
  - . . Vostok spacecraft
  - . . . **Vostok 4 spacecraft**
- soft landing spacecraft
  - . Vostok spacecraft
  - . . **Vostok 4 spacecraft**

**Vostok 5 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 5 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . Vostok spacecraft
    - . . . **Vostok 5 spacecraft**
  - soft landing spacecraft
    - . Vostok spacecraft
    - . . **Vostok 5 spacecraft**

**Vostok 6 spacecraft**

- GS manned spacecraft
  - . Vostok spacecraft
  - . . **Vostok 6 spacecraft**
  - reentry vehicles
    - . recoverable spacecraft
    - . . Vostok spacecraft
    - . . . **Vostok 6 spacecraft**
  - soft landing spacecraft
    - . Vostok spacecraft
    - . . **Vostok 6 spacecraft**

**Vostok spacecraft**

- GS manned spacecraft
  - . **Vostok spacecraft**
  - . . Vostok 1 spacecraft
  - . . Vostok 2 spacecraft
  - . . Vostok 3 spacecraft
  - . . Vostok 4 spacecraft
  - . . Vostok 5 spacecraft
  - . . Vostok 6 spacecraft
  - reentry vehicles
    - . recoverable spacecraft
    - . . **Vostok spacecraft**
    - . . . Vostok 1 spacecraft
    - . . . Vostok 2 spacecraft
    - . . . Vostok 3 spacecraft
    - . . . Vostok 4 spacecraft
    - . . . Vostok 5 spacecraft
    - . . . Vostok 6 spacecraft
  - soft landing spacecraft
    - . **Vostok spacecraft**
    - . . Vostok 1 spacecraft
    - . . Vostok 2 spacecraft
    - . . Vostok 3 spacecraft
    - . . Vostok 4 spacecraft
    - . . Vostok 5 spacecraft
    - . . Vostok 6 spacecraft
- RT space capsules

**voting**

- RT governments
  - law (jurisprudence)
  - minorities
  - politics
  - sovereignty

**vowels**

- RT consonants (speech)
  - grammars
  - languages
  - words (language)

**Voyager 1 spacecraft**

- DEF A spacecraft launched in the 1977 Voyager mission.
- GS interplanetary spacecraft
  - . **Voyager 1 spacecraft**
  - unmanned spacecraft
    - . space probes
    - . . **Voyager 1 spacecraft**
- RT flyby missions
  - Grand Tours
  - Jupiter (planet)
  - Jupiter probes
  - Jupiter rings

## Voyager 2 spacecraft

∞ spacecraft

### Voyager 2 spacecraft

DEF A spacecraft launched in the 1977 Voyager mission.

GS interplanetary spacecraft

. **Voyager 2 spacecraft**

unmanned spacecraft

. space probes

. . . **Voyager 2 spacecraft**

RT

flyby missions

Grand Tours

Jupiter (planet)

Jupiter probes

Neptune (planet)

Saturn (planet)

∞ spacecraft

Uranus (planet)

### Voyager 1977 mission

DEF The launching of two advanced three-axis attitude stabilized spacecraft for the exploration of Jovian and Saturnian environments including investigation of the gravitational fields, atmospheric dynamics, and magnetospheres of these planets.

GS space missions

. flyby missions

. . Grand Tours

. . . **Voyager 1977 mission**

RT

interplanetary spacecraft

Jupiter (planet)

Jupiter probes

∞ missions

solar system

space probes

### Voyager project

GS programs

. NASA programs

. . NASA space programs

. . . **Voyager project**

. projects

. . **Voyager project**

. space programs

. . NASA space programs

. . . **Voyager project**

RT

Mars probes

Saturn project

space probes

unmanned spacecraft

Venus probes

### Voyageur helicopter

USE **CH-46 helicopter**

### VR (virtual reality)

USE **virtual reality**

### VSAT (network)

UF *very small aperture terminals*

GS data processing equipment

. data processing terminals

. . **VSAT (network)**

networks

. communication networks

. . **VSAT (network)**

. satellite networks

. . **VSAT (network)**

RT Aloha system

apertures

ARPA computer network

computer networks

data links

data transmission

distributed processing

Earth terminals

interprocessor communication

local area networks

microwave transmission

needs (data system)

personal computers

random access

superhigh frequencies

telecommunication

### VTOL

USE **vertical landing**

**vertical takeoff**

### VTOL aircraft

USE **vertical takeoff aircraft**

### Vulcan aircraft

UF *AVRO 698 aircraft*

GS attack aircraft

. bomber aircraft

. . **Vulcan aircraft**

Hawker Siddeley aircraft

. **Vulcan aircraft**

jet aircraft

. **Vulcan aircraft**

tailless aircraft

. **Vulcan aircraft**

RT ∞ aircraft

AVRO 707 aircraft

Harrier aircraft

### vulcanizates

USE **vulcanized elastomers**

### vulcanized elastomers

UF *gum vulcanizates*

*vulcanizates*

GS elastomers

. rubber

. . synthetic rubbers

. . . **vulcanized elastomers**

. . . . RTV-40 rubber (trademark)

. . . . RTV-60 rubber (trademark)

RT

addition resins

polyether resins

thermoplastic resins

vulcanizing

### vulcanizing

DEF A chemical reaction in which the physical properties of a rubber are changed in the direction of decreased plastic flow, less surface tackiness, and increased tensile strength by reacting it with sulfur or other suitable agents.

GS crosslinking

. **vulcanizing**

RT curing

vulcanized elastomers

### vulnerability

GS **vulnerability**

. nuclear vulnerability

RT

aircraft reliability

aircraft survivability

airport security

durability

integrity

life (durability)

obstacle avoidance

penetration

piercing

reliability

∞ resistance

security

sensitivity

spacecraft defense

spacecraft survivability

stability

### Vycor

GS fibers

. synthetic fibers

. . **Vycor**

glass

. **Vycor**

semiconductors (materials)

. **Vycor**

RT

glass fibers

∞ materials

silicon dioxide

### VZ-2 aircraft

GS Boeing aircraft

. **VZ-2 aircraft**

research vehicles

. research aircraft

. . **VZ-2 aircraft**

tilt wing aircraft

. **VZ-2 aircraft**

V/STOL aircraft

. **VZ-2 aircraft**

RT ∞ aircraft

### VZ-8 aircraft

UF *Airgeep aircraft*

GS light aircraft

. **VZ-8 aircraft**

Piasecki aircraft

. **VZ-8 aircraft**

research vehicles

. research aircraft

. . **VZ-8 aircraft**

V/STOL aircraft

. vertical takeoff aircraft

. . **VZ-8 aircraft**

RT ∞ aircraft

flying platforms

### VZ-10 aircraft

USE **XV-4 aircraft**

### VZ-11 aircraft

USE **XV-5 aircraft**

### VZ-12 aircraft

USE **P-1127 aircraft**

# W

*W stars*  
USE **Wolf-Rayet stars**

*W wings*  
USE **variable sweep wings**

*W2F aircraft*  
USE **E-2 aircraft**

## Wabash River Basin (IL-IN-OH)

GS landforms  
. structural basins  
. . river basins  
. . . **Wabash River Basin (IL-IN-OH)**

RT Illinois  
Indiana  
Ohio  
rivers

## wadis

DEF A term used in the desert regions of Southwest Asia and Northern Africa for a stream bed or channel, or a steep sided and bouldery ravine, gully or valley, or a dry wash, that is usually dry except during the rainy season and that often forms an oasis.

GS landforms  
. structural basins  
. . river basins  
. . . **wadis**

RT arid lands  
desertification  
rivers  
streams  
topography  
valleys  
water runoff

## wafers

RT microelectronics  
microminiaturization  
miniaturization  
photomasks  
semiconductor devices  
solid state devices  
thin films  
vertical junction solar cells

## wage surveys

GS reports  
. **wage surveys**  
surveys  
. . **wage surveys**

RT cost analysis  
cost estimates  
cost reduction  
employee relations  
finance  
personnel

## wakefulness

RT alertness  
sleep deprivation

## wakes

GS **wakes**  
. aircraft wakes  
. . helicopter wakes  
. . slipstreams  
. . . propeller slipstreams  
. hypersonic wakes  
. laminar wakes  
. near wakes  
. supersonic wakes  
. turbulent wakes  
. . slipstreams  
. . . propeller slipstreams

RT backwash  
base flow  
bubbles  
cavitation flow  
contrails  
downwash

∞ draft  
drag  
ground effect (aerodynamics)  
horseshoe vortices  
Strouhal number  
turbulence

vortex alleviation  
vortices

## Wales

(added November 1989)  
GS nations  
. United Kingdom  
. . **Wales**

RT Europe

## walking

GS locomotion  
. **walking**

RT gait  
physical exercise  
running

## walking machines

GS surface vehicles  
. **walking machines**

RT astronaut maneuvering equipment  
gait  
lunar surface vehicles

∞ machinery  
manned lunar surface vehicles  
prosthetic devices

## wall flow

GS fluid flow  
. **wall flow**

RT boundary layer flow  
channel flow  
conical flow  
discharge coefficient  
ducted flow  
Goertler instability  
heat transmission  
Manning theory  
two dimensional flow  
two dimensional jets

## wall jets

RT fluid amplifiers  
jet boundaries  
jet flow  
jet vanes

∞ jets

## wall pressure

GS pressure  
. **wall pressure**

RT boundary layers  
pressure distribution  
pressure vessels  
thick walls

## wall temperature

GS surface properties  
. surface temperature  
. . **wall temperature**  
temperature  
. surface temperature  
. . **wall temperature**

RT Brinkman number  
operating temperature  
thick walls

## Wallops Island

GS landforms  
. islands  
. . **Wallops Island**

RT Atlantic Ocean  
Virginia

## walls

UF *cold walls*

GS **walls**  
. bulkheads  
. nozzle walls  
. porous walls  
. thick walls  
. thin walls  
. Trombe walls  
. wind tunnel walls

RT ∞ barriers  
buildings  
curtains  
enclosures  
floors

gates (openings)  
housings  
limiters (fusion reactors)  
panels  
partitions (structures)  
sandwich structures  
sheaths  
shells (structural forms)  
sides  
studs (structural members)  
substructures  
tiles

## Walsh function

GS analysis (mathematics)  
. complex variables  
. . orthogonal functions  
. . . **Walsh function**  
functions (mathematics)  
. orthogonal functions  
. . **Walsh function**

RT fast Fourier transformations  
Fourier transformation  
functional analysis  
matrices (mathematics)

## WAN

USE **wide area networks**

## Wankel engines

GS engines  
. internal combustion engines  
. . rotary engines  
. . . **Wankel engines**

RT aircraft engines  
automobile engines  
piston engines

## war games

GS games  
. **war games**

RT digital simulation  
game theory  
mathematical models  
operations research  
simulation

## warfare

GS **warfare**  
. antiship warfare  
. antisubmarine warfare  
. chemical warfare  
. combat  
. electronic warfare  
. nuclear warfare  
attacking (assaulting)

RT B-1 aircraft  
chemical defense  
evasive actions  
infiltration  
international law  
ordnance  
peacetime  
politics  
strategy  
violence

## warheads

DEF Originally the parts of the missile carrying the explosive, chemical, or other charge intended to damage the enemy. By extension, the term is sometimes used as synonymous with payload or nose cone.

GS weapons  
. **warheads**  
. . nuclear warheads  
. . precision guided projectiles

RT ammunition  
antiship warfare  
bombs (ordnance)  
explosive devices  
explosives

∞ fuses  
fuses (ordnance)  
missile components  
missiles  
nose cones  
nuclear devices  
nuclear weapons

## warm fronts

payloads  
projectiles  
∞ rockets  
shaped charges  
torpedoes

*warm blooded animals*  
USE **homeotherms**

### warm fronts

GS fronts (meteorology)  
. **warm fronts**  
RT air masses  
cold fronts  
∞ fronts  
meteorological parameters  
meteorology  
storms  
synoptic meteorology  
thunderstorms  
tornadoes  
weather forecasting

*warming*  
USE **heating**

### warning

RT accident prevention  
auditory signals  
bells  
civil defense  
collision avoidance  
detection  
∞ detectors  
early warning systems  
fire prevention  
horns  
mine detectors  
monitors  
protection  
safety  
safety devices

*warning devices*  
USE **warning systems**

*warning signals*  
USE **warning systems**

*Warning Star aircraft*  
USE **C-121 aircraft**

### warning systems

UF *alarms*  
*collision warning devices*  
*warning devices*  
*warning signals*  
GS **warning systems**  
. early warning systems  
. . Ballistic Missile Early Warning System  
RT . mine detectors  
accident prevention  
auditory signals  
avoidance  
bells  
civil defense  
collision avoidance  
detection  
∞ detectors  
display devices  
explosions  
false alarms  
fire prevention  
fires  
gas detectors  
hazards  
head-up displays  
horns  
monitors  
National Severe Storms Project  
pollution monitoring  
protection  
public address systems  
safety  
safety devices  
safety management  
sanitation  
sirens  
sound generators

∞ systems  
threat evaluation

### warpage

RT bending  
buckling  
camber  
damage  
deformation  
distortion  
growth  
heaving  
plastic deformation  
shrinkage  
structural strain  
surface distortion  
thermal expansion  
twisting

### ∞ washers

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT washers (cleaners)  
washers (spacers)

### washers (cleaners)

RT cleaners  
concentrators  
extraction  
separators  
∞ washers  
washing

### washers (spacers)

GS fasteners  
. **washers (spacers)**  
RT inserts  
separators  
spacers  
∞ washers

### washing

UF *scrubbing*  
GS cleaning  
. **washing**  
RT . . bathing  
beneficiation  
decontamination  
dissolving  
distillation  
elution  
flushing  
housekeeping (spacecraft)  
purification  
scrubbers  
∞ separation  
washers (cleaners)  
waste water

### Washington

GS nations  
. United States  
. . **Washington**  
RT Cascade Range (CA-OR-WA)  
Columbia River Basin (ID-OR-WA)

### washout (radioactivity)

USE **fallout**

### WASP sounding rocket

UF *high altitude sounding projectile*  
*window atmosphere sounding projectile*  
GS rocket vehicles  
. multistage rocket vehicles  
. . **WASP sounding rocket**  
. . sounding rockets  
. . **WASP sounding rocket**  
RT Loki rocket vehicle  
solid propellant rocket engines

### Waspaloy

GS alloys  
. heat resistant alloys  
. . **Waspaloy**  
. . nickel alloys  
. . **Waspaloy**  
RT chromium alloys  
cobalt alloys

wrought alloys

### waste disposal

GS disposal  
. **waste disposal**  
. . composting  
. . hazardous material disposal (in space)  
management  
. waste management  
. . **waste disposal**  
. . . composting  
. . . hazardous material disposal (in space)  
RT air pollution  
deep well injection (wastes)  
dewatering  
dilution  
dissipation  
drainage  
effluents  
elimination  
environment effects  
environment pollution  
environment protection  
environmental chemistry  
environmental cleanup  
environmental engineering  
environmental surveys  
exhaust gases  
exhaust systems  
garbage  
hazardous materials  
hazardous wastes  
human wastes  
incinerators  
industrial wastes  
landfills  
manures  
materials handling  
metabolic wastes  
mines (excavations)  
Modular Integrated Utility System  
pipelines  
plasma core reactors  
pollution  
ponds  
radioactive wastes  
sanitation  
sewage  
sewage treatment  
sewers  
soil pollution  
solid wastes  
space flight feeding  
∞ storage  
sumps  
toilets  
utilities  
wastes  
water pollution

### waste energy utilization

GS utilization  
. **waste energy utilization**  
RT boilers  
burners  
chimneys  
cogeneration  
energy conversion  
exergy  
exhaust gases  
furnaces  
heat transfer  
heating  
incinerators  
lighting equipment  
ovens  
solid wastes  
space heating (buildings)  
waste heat  
wastes

### waste heat

RT energy technology  
heat exchangers  
heat pumps

- waste energy utilization
- waste management**  
(added March 1997)
- GS management
    - . **waste management**
    - . . waste disposal
    - . . . composting
    - . . . hazardous material disposal (in space)
    - . . waste treatment
    - . . . sewage treatment
    - . . waste utilization
  - RT environment management
    - environmental engineering
    - landfills
    - life support systems
    - materials recovery
    - reclamation
    - recycling
    - sanitation
    - underground storage
    - wastes
- waste treatment**  
DEF The processing of waste materials (liquid and solid) with chemicals, high temperature, chopping, grinding, and filtering equipment, bacterial action, dryers, separators, for conversion to useful products.
- GS management
    - . waste management
    - . . **waste treatment**
    - . . . sewage treatment
  - RT bacteria
    - composting
    - environmental cleanup
    - garbage
    - residues
    - sludge
    - ∞ treatment
    - wastes
- waste utilization**
- GS management
    - . waste management
    - . . **waste utilization**
    - utilization
    - . **waste utilization**
  - RT biomass energy production
    - composting
    - hydrocarbon fuel production
    - industrial wastes
    - landfills
    - manures
    - renewable energy
    - solid wastes
    - wastes
- waste water**
- GS wastes
    - . liquid wastes
    - . . **waste water**
    - water
    - . **waste water**
  - RT bathing
    - cleaning
    - flushing
    - industrial wastes
    - residues
    - washing
    - water cooled reactors
- wastes**
- GS **wastes**
    - . garbage
    - . industrial wastes
    - . liquid wastes
    - . . urine
    - . . waste water
    - . manures
    - . metabolic wastes
    - . . human wastes
    - . . . feces
    - . . . urine
    - . hazardous wastes
    - . radioactive wastes
    - . sewage
    - . solid wastes
  - RT activated sludge
- air pollution
- beneficiation
- by-products
- combustion products
- contaminants
- debris
- effluents
- environment effects
- exhaust gases
- forest fires
- fumes
- gas recovery
- impurities
- leakage
- losses
- nonpoint sources
- organic wastes (fuel conversion)
- pollution
- residues
- scrap
- sewers
- slags
- sludge
- waste disposal
- waste energy utilization
- waste management
- waste treatment
- waste utilization
- oxides
- peninsulas
- pollution
- precipitation (meteorology)
- runway conditions
- slush
- sounds (topographic features)
- steam
- straits
- utilities
- water sampling
- water splitting
- watersheds
- wharves
- windpowered pumps
- water balance**
- GS balance
    - . material balance
    - . . **water balance**
  - RT body fluids
    - edema
    - ∞ equilibrium
    - homeostasis
    - hydrometeorology
    - lysimeters
    - osmosis
    - urination
- water circulation**
- GS circulation
    - . **water circulation**
    - . . water currents
      - . . . ocean currents
      - . . . . coastal currents
      - . . . . . el Nino
      - . . . . . Gulf Stream
      - . . . . . Lomonosov current
      - . . thermohaline circulation
  - RT lakes
    - oceanography
    - pollution transport
    - wind effects
- water color**
- GS electromagnetic properties
    - . optical properties
    - . . color
    - . . . **water color**
  - RT Coastal Zone Color Scanner
    - dissolved organic matter
    - lakes
    - ocean color scanner
    - oceans
    - rivers
    - Sea-viewing Wide Field-of-view Sensor
- water consumption**
- GS consumption
    - . **water consumption**
  - RT drought
    - irrigation
    - seepage
- water content*
- USE **moisture content**
- water cooled reactors**
- UF *physical constants testing reactor*
  - GS nuclear reactors
    - . liquid cooled reactors
    - . . **water cooled reactors**
    - . . . boiling water reactors
    - . . . . experimental boiling water reactors
    - . . . . . Halden Boiling Water Reactor
    - . . . . . Los Alamos Water Boiler Reactor
    - . . . . . Pathfinder nuclear reactor
    - . . . . . Spert reactors
    - . . . heavy water reactors
    - . . . . heavy water components test reactors
    - . . . . . plutonium recycle test reactor
    - . . . . . zero power reactor 2
    - . . . light water reactors
    - . . . NRX reactors
    - . . . Plum Brook Reactor
    - . . . pressurized water reactors
- watches*
- USE **clocks**
- water**  
DEF Dihydrogen oxide (molecular formula H<sub>2</sub>O). The word is used ambiguously to refer to the chemical compound in general and to its liquid phase; when the former is meant, the term water substance is often used.
- GS **water**
    - . cold water
    - . deep water
    - . fresh water
    - . heavy water
    - . inland waters
    - . . ground water
    - . extraterrestrial water
    - . light water
    - . nearshore water
    - . . coastal water
    - . polywater
    - . potable water
    - . sea water
    - . shallow water
    - . shoals
    - . springs (water)
    - . surface water
    - . vadose water
    - . waste water
  - RT aquifers
    - arroyos
    - bay ice
    - body fluids
    - cavitation flow
    - fiords
    - humidity
    - hydrates
    - ∞ hydraulics
    - hydrodynamics
    - hydrogen bonds
    - hydrogen compounds
    - hydrology
    - hydromechanics
    - hydrostatics
    - ice
    - isthmuses
    - Lake Erie
    - Lake Huron
    - lake ice
    - Lake Michigan
    - Lake Ontario
    - Lake Superior
    - laterites
    - life support systems
    - limnology
    - liquids
    - moderators
    - moisture
    - moisture content
    - muskegs

## water currents

- . . . . spectral shift control reactor
- . . . . swimming pool reactors
- . . . . zero power reactors
- . . . . zero power reactor 2
- . . . . zero power reactor 3
- . . . . zero power reactor 6
- . . . . zero power reactor 9

RT chemical reactors  
nuclear engine for rocket vehicles  
∞ reactors  
waste water

### water cooling

USE **liquid cooling**

### water currents

DEF Net transport of water along a definable path. Used for currents (oceanography).

UF *currents (oceanography)*

GS circulation  
. . . water circulation  
. . . **water currents**  
. . . ocean currents  
. . . . coastal currents  
. . . . el Nino  
. . . . Gulf Stream  
. . . . Lomonosov current

RT arroyos  
∞ currents  
oceanography  
rapids  
sea roughness  
sea states  
surface waves  
tides  
upstream

### water cycle (hydrology)

USE **hydrological cycle**

### water deprivation

GS deprivation  
. . **water deprivation**

### water depth

RT cnoidal waves  
coastal water  
lakes  
nearshore water  
oceans  
shallow water  
shoals

### water erosion

GS erosion  
. . **water erosion**  
RT arroyos  
canyons  
drainage patterns  
flood damage  
rain impact damage  
ravines  
soil erosion  
wind erosion

### water flow

GS fluid flow  
. . liquid flow  
. . . **water flow**  
RT alluvium  
canals  
drainage  
drainage patterns  
flood damage  
floods  
flow measurement  
Great Lakes (North America)  
ground water  
∞ hydraulics  
hydrodynamics  
hydrology models  
open channel flow  
pipe flow  
rapids  
watersheds

### water hammer

RT hydraulic equipment  
hydrodynamics  
pipe flow

pipelines  
rams (pumps)  
surges  
valves

### water heating

DEF The heating of water by any means including solar technology.

GS heating  
. . **water heating**  
RT domestic energy  
geothermal energy extraction  
heat exchangers  
∞ heaters  
heating equipment  
residential energy  
temperature control

### water immersion

RT baths  
liquid cooling  
quenching (cooling)  
sinking  
∞ soaking  
submerged bodies  
submerging  
underwater tests

### water injection

GS injection  
. . fluid injection  
. . . liquid injection  
. . . . **water injection**  
RT gas injection  
perforating  
thrust augmentation

### ∞ water intakes

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)  
RT air intakes  
intake systems  
manifolds  
nose inlets  
plenum chambers  
scoops  
side inlets

### water jets

USE **hydraulic jets**

### water landing

GS landing  
. . **water landing**  
RT aircraft landing  
crash landing  
ditching (landing)  
glide landings  
hard landing  
horizontal spacecraft landing  
hydroplaning  
planetary landing  
soft landing  
spacecraft landing  
spacecraft recovery  
splashing  
touchdown

### water loss

RT dehydration  
drying  
evaporation  
losses

### water management

GS management  
. . **water management**  
RT conservation  
drought  
environment management  
floods  
hydrology  
Lake Erie  
Lake Huron  
Lake Michigan  
Lake Ontario  
Lake Superior  
limnology  
potable water  
Pyramid Lake (NV)

watersheds

### water masers

GS emission  
. . **water masers**  
stimulated emission devices  
. . masers  
. . . **water masers**  
RT gas lasers  
gas masers  
interstellar masers  
maser outputs

### water moderated reactors

GS nuclear reactors  
. . **water moderated reactors**  
. . . experimental boiling water reactors  
. . . heavy water components test reactors  
. . . plutonium recycle test reactor  
RT light water reactors

### water pollution

GS pollution  
. . environment pollution  
. . . **water pollution**  
. . . . oil pollution  
RT algae  
alkalinity  
biochemical oxygen demand  
clean energy  
contamination  
dissolved organic matter  
drought  
environment effects  
environment protection  
environmental chemistry  
environmental cleanup  
environmental quality  
environmental surveys  
inland waters  
landfills  
limnology  
lysimeters  
marine resources  
oil slicks  
phytoplankton  
pollution monitoring  
pollution transport  
purity  
soil pollution  
thermal pollution  
waste disposal  
water sampling

### water pressure

GS pressure  
. . fluid pressure  
. . . **water pressure**  
RT ∞ hydraulics  
hydrodynamics  
hydrostatic pressure  
hydrostatics  
inlet pressure  
pipe flow

### water purification

USE **water treatment**

### water quality

GS quality  
. . environmental quality  
. . . **water quality**  
RT alkalinity  
environment effects  
water sampling

### water reclamation

UF *water recovery*  
GS reclamation  
. . materials recovery  
. . . **water reclamation**  
RT conservation  
dewatering  
drought

- pollution
- water recovery*
- USE **water reclamation**
- water resources**
- GS resources
- . Earth resources
  - . . . **water resources**
  - . . . aquifers
- RT environment effects
- environment management
- Great Lakes (North America)
- ground water
- hydrology
- inland waters
- International Hydrological Decade
- lakes
- limnology
- oceans
- ponds
- potable water
- precipitation (meteorology)
- Pyramid Lake (NV)
- rainmaking
- reservoirs
- sea water
- underwater resources
- wetlands
- windpowered pumps
- water runoff**
- RT drainage
- ground water
- inland waters
- resources management
- rivers
- wadis
- water sampling**
- (added March 1998)
- DEF The process of obtaining a representative sample of water from any natural or artificial environment.
- GS sampling
- . **water sampling**
- RT environmental monitoring
- ground water
- pollution monitoring
- sea water
- surface water
- water
- water pollution
- water quality
- water splitting**
- (added September 1988)
- GS splitting
- . **water splitting**
- RT electrolysis
- hydrogen fuels
- hydrogen production
- thermochemistry
- water
- water tables**
- RT aquifers
- drainage
- ground water
- potable water
- springs (water)
- vadose water
- watersheds
- water takeoff and landing aircraft**
- GS **water takeoff and landing aircraft**
- . seaplanes
- RT ∞ aircraft
- amphibious aircraft
- antisubmarine warfare aircraft
- commercial aircraft
- ground effect machines
- hovercraft ground effect machines
- light aircraft
- monoplanes
- passenger aircraft
- reconnaissance aircraft
- S-61 helicopter
- sea launching
- submersible aircraft
- ∞ subsonic aircraft
  - transport aircraft
  - utility aircraft
- water temperature**
- GS temperature
- . **water temperature**
  - . . ocean temperature
  - . . . sea surface temperature
- RT surface temperature
- temperature distribution
- thermal pollution
- water treatment**
- UF *water purification*
- RT activated carbon
- adsorption
- aeration
- agitation
- bentonite
- biochemical oxygen demand
- chlorination
- coagulation
- contaminants
- corrosion prevention
- demineralizing
- desalinization
- environmental cleanup
- filtration
- floculating
- flotation
- ion exchanging
- material absorption
- pollution
- potable water
- purification
- ∞ screening
  - settling
  - sewage
  - ∞ treatment
- water tunnel tests**
- RT air water interactions
- cross flow
- flow distribution
- flow visualization
- strakes
- ∞ tests
  - water waves
  - wind tunnel tests
- water tunnels*
- USE **hydraulic test tunnels**
- water vapor**
- DEF Water (H<sub>2</sub>O) in gaseous form. Also called aqueous vapor.
- GS vapors
- . **water vapor**
- RT atmospheric moisture
- dew
- humidity
- mixing ratios
- moisture
- moisture content
- steam
- water vehicles**
- GS **water vehicles**
- . boats
  - . . lifeboats
  - . . . captured air bubble vehicles
  - . ships
  - . . Advanced Range Instrumentation Ship
  - . . aircraft carriers
  - . . cargo ships
  - . . . Savannah nuclear ship
  - . . . tanker ships
  - . . nuclear powered ships
  - . . . Savannah nuclear ship
  - . . satellite communications ships
  - . . submarines
  - . . . ballistic missile submarines
  - . . . guided missile submarines
  - . . . trident submarine
  - . . surface effect ships
  - . . SWATH (ship)
  - . . underwater vehicles
  - . . submarines
- . . . ballistic missile submarines
  - . . . guided missile submarines
  - . . . trident submarine
  - . . underwater research laboratories
- RT amphibious vehicles
- harbors
- marine transportation
- ∞ military vehicles
  - research vehicles
  - shipyards
  - surface vehicles
  - ∞ vehicles
- water waves**
- GS **water waves**
- . tidal waves
- RT breakwaters
- capillary waves
- cnoidal waves
- elastohydrodynamics
- frontal waves
- gravity waves
- hydrodynamic coefficients
- littoral transport
- ocean dynamics
- ripples
- sea roughness
- sea states
- surface waves
- tsunami waves
- water tunnel tests
- waterwave energy
- waterwave energy conversion
- waterwave powered machines
- ∞ waves
- water wheels**
- GS wheels
- . **water wheels**
- RT hydroelectric power stations
- turbine wheels
- waterfowl**
- GS animals
- . vertebrates
  - . . birds
  - . . . **waterfowl**
- RT beaches
- coastal ecology
- marine biology
- marine environments
- marshlands
- migration
- oceanography
- wetlands
- waterproofing**
- RT barrier layers
- caulking
- coatings
- hydrophobicity
- insulation
- moisture resistance
- protective coatings
- sealing
- weatherproofing
- watersheds**
- UF *catchment areas*
- GS landforms
- . structural basins
  - . . **watersheds**
- RT divides (landforms)
- drainage patterns
- flood control
- floods
- hydrogeology
- hydrology
- International Hydrological Decade
- Missouri River Basin (US)
- mountains
- ponds
- precipitation (meteorology)
- rain
- river basins
- rivers
- storms (meteorology)
- valleys
- water
- water flow



## waterwave energy

water management  
water tables

### waterwave energy

GS renewable energy  
. **waterwave energy**  
RT clean energy  
Earth resources  
∞ energy  
oceanography  
tidepower  
water waves  
∞ waves

### waterwave energy conversion

GS energy conversion  
. **waterwave energy conversion**  
RT ∞ conversion  
Earth resources  
energy conversion efficiency  
∞ energy sources  
ocean currents  
ocean surface  
oceanography  
oceans  
renewable energy  
sea roughness  
tide powered generators  
tide powered machines  
tidepower  
tides  
water waves

### waterwave powered machines

RT ∞ machinery  
ocean currents  
ocean surface  
sea roughness  
tide powered generators  
tide powered machines  
tidepower  
tides  
water waves

### waterways

DEF Navigable streams or canals; also channels for the passage or escape of water.

GS **waterways**  
. canals  
. harbors  
. . . artificial harbors  
RT lakes  
rivers  
straits

### wattmeters

DEF Instruments for measuring the magnitude of the active power in an electric circuit. They are provided with a scale usually graduated in either watts, kilowatts, or megawatts. If the scale is graduated in kilowatts or megawatts, the instruments are usually designated as kilowattmeters or megawattmeters.

GS measuring instruments  
. **wattmeters**  
RT electrical measurement  
electrometers

### wave amplification

GS amplification  
. **wave amplification**  
RT baroclinic waves  
electromagnetic radiation  
∞ waves

### wave attenuation

GS attenuation  
. **wave attenuation**  
. . . acoustic attenuation  
. . . shock wave attenuation  
. . . radar attenuation  
. . . radio attenuation  
RT atmospheric attenuation  
electromagnetic absorption  
electromagnetic missiles  
infrared absorption  
radar transmission  
radio transmission

shock wave propagation

### wave degradation

GS degradation  
. **wave degradation**  
RT attenuation  
electromagnetic missiles  
scattering  
shock wave interaction

### wave diffraction

GS diffraction  
. **wave diffraction**  
RT apodization  
attenuation  
crosstalk  
diffraction radiation  
Fresnel integrals  
geometrical theory of diffraction  
holographic optical elements  
∞ interference  
traveling wave modulation

### wave dispersion

RT acoustic properties  
atmospheric refraction  
attenuation  
∞ coherence  
color  
deflection  
diffraction  
∞ dispersion  
elastic waves  
electromagnetic radiation  
fading  
light transmission  
optical paths  
optical properties  
radiation distribution  
radio wave refraction  
refraction  
scattering  
sound-sound interactions  
transmission  
transmission loss

### wave drag

GS dynamic characteristics  
. drag  
. . . pressure drag  
. . . **wave drag**  
. . . . interference drag  
RT friction drag  
supersonic drag

### wave equations

SN (NOT EQUATIONS OF MOTION)  
GS **wave equations**  
. Dirac equation  
. eikonal equation  
. Fowcs Williams-Hawkings equation  
. Klein-Gordon equation  
. Korteweg-Devries equation  
. Lamé wave equations  
. Schroedinger equation  
RT Boltzmann-Vlasov equation  
density wave model  
∞ equations  
forbidden bands  
∞ Helmholtz equations  
hyperbolic differential equations  
partial differential equations  
quantum theory

### wave excitation

GS excitation  
. **wave excitation**  
. . . acoustic excitation  
. . . harmonic excitation  
RT diffraction radiation  
stroking tests  
∞ waves

### wave front deformation

GS deformation  
. **wave front deformation**  
RT ∞ interference

thermal lensing

### wave front reconstruction

GS reconstruction  
. **wave front reconstruction**  
RT acoustical holography  
diffractometers  
holographic interferometry  
holographic spectroscopy  
holography  
kinoform  
microwave holography  
photography  
white light holography

### wave fronts

DEF A continuous surface drawn through the most forward points in wave disturbances that have the same phase.

GS **wave fronts**  
. shock fronts  
RT caustic lines  
eikonal equation  
∞ fronts  
Huygens principle  
phase coherence  
phase velocity  
shock discontinuity  
∞ waves

### wave functions

GS **wave functions**  
. molecular orbitals  
. Pauli exclusion principle  
RT density functional theory  
forbidden transitions  
Hartree approximation  
perturbation theory  
square waves  
time functions

### wave generation

RT electromagnetic radiation  
function generators  
∞ generators  
harmonic generations  
shock wave generators  
wave rotors

### wave incidence control

RT ∞ control  
incident radiation

### wave interaction

GS **wave interaction**  
. shock wave interaction  
. wave-particle interactions  
RT acoustic coupling  
coupling  
damping  
electroacoustic waves  
electromagnetic interactions  
four-wave mixing  
∞ interactions  
intermodulation  
modulation  
orthogonal multiplexing theory  
plasma interactions  
propagation modes  
scattering  
shock wave luminescence  
shock wave profiles  
shock wave propagation

*wave motion*

USE **waves**

*wave oscillators*

USE **oscillators**

### wave packets

RT longitudinal waves  
packets (communication)  
plasma waves  
quantum mechanics  
transverse waves

### wave propagation

UF *Kirchhoff-Huygens principle*  
GS transmission

- . **wave propagation**
  - .. acoustic propagation
  - .. sound propagation
  - .. diffraction propagation
  - .. ground wave propagation
  - .. ionospheric propagation
  - .. ionospheric F-scatter propagation
  - .. light scattering
    - ... halos
  - .. scatter propagation
    - ... ionospheric F-scatter propagation
  - .. shock wave propagation
  - .. transequatorial propagation
- RT acoustic attenuation
- acoustic microscopes
- atmospheric attenuation
- attenuation
- automatic picture transmission
- beam waveguides
- ∞ coherence
- coherent radiation
- computational aeroacoustics
- ∞ conduction
- diffraction
- double sideband transmission
- electromagnetic absorption
- electromagnetic missiles
- electromagnetic wave transmission
- evanescent waves
- Ffowcs Williams-Hawkings equation
- geometrical acoustics
- group velocity
- Huygens principle
- hydraulic analogies
- ion acoustic waves
- Lame wave equations
- light transmission
- lossy media
- microwave attenuation
- microwave transmission
- multipath transmission
- nonadiabatic theory
- phase velocity
- plasma acceleration
- plasmaguides
- ∞ propagation
- propagation modes
- propagation velocity
- pulse diffraction
- radar attenuation
- radar transmission
- radio attenuation
- radio transmission
- refraction
- Sagnac effect
- screen effect
- shock fronts
- shock wave attenuation
- short wave radio transmission
- single sideband transmission
- sound transmission
- square waves
- stress waves
- television transmission
- waveforms
- whispering gallery modes
- Whitham rule

*wave radiation*

USE **electromagnetic radiation**

**wave reflection**

GS reflection

- . **wave reflection**
- .. Mach reflection

RT ground effect (communications)

reflected waves

signal reflection

spread reflection

**wave resistance**

RT blast loads

erosion

impact strength

∞ resistance

structural stability

**wave rotors**

(added March 1998)

DEF Rotor devices that use gasdynamic

waves to transfer energy rather than the motion of solid surfaces. Typically, they consist of a series of passages arranged on a drum which rotates about an axis. Through rotation, the ends of the passages are periodically exposed to various circumferentially arranged ports which initiate the traveling expansion or compression waves within the passages. The particular circumferential location of the ports determines the thermodynamic cycle of the working fluid.

GS rotating bodies

- . rotors

- .. **wave rotors**

RT compression waves

energy transfer

engine parts

gas dynamics

gas generators

gas turbine engines

topping cycle engines

turbomachinery

turboshafts

wave generation

**wave scattering**

GS scattering

- . **wave scattering**
- .. acoustic scattering
- ... reverberation
- .. atmospheric scattering
- ... tropospheric scattering
- .. electromagnetic scattering
- ... ionospheric F-scatter propagation
- ... light scattering
  - ... halos
- ... microwave scattering
- ... Mie scattering
- ... Rayleigh scattering
- ... Raman spectra
- ... Thomson scattering
- ... x ray scattering

RT Faddeev equations

magnetic dispersion

reciprocity theorem

scattering amplitude

scatterometers

shock fronts

**waveforms**

DEF The graphical representations of waves, showing variation of amplitude with time.

GS **waveforms**

- . pulse amplitude
- . pulse duration
- . sawtooth waveforms
- . square waves

RT form factors

speech baseband compression

time functions

wave propagation

**waveguide antennas**

GS antennas

- . **waveguide antennas**
- .. horn antennas

RT corrugated waveguides

dielectric waveguides

lens antennas

microstrip antennas

microwave antennas

monopulse antennas

radant

slot antennas

Yagi antennas

**waveguide filters**

GS electromagnetic wave filters

- . electric filters
- .. **waveguide filters**

RT bandstop filters

dielectric waveguides

microwave filters

radar filters

waveguides

**waveguide lasers**

DEF Pump sources for deuterium oxide lasers.

GS stimulated emission devices

- . lasers

**waveguide lasers**

- .. fiber lasers

RT aluminum gallium arsenide lasers

carbon dioxide lasers

gallium arsenide lasers

heterojunction devices

infrared lasers

laser modes

laser outputs

optical waveguides

pulsed lasers

quantum well lasers

semiconductor lasers

surface emitting lasers

tube lasers

**waveguide tuners**

GS tuners

- . **waveguide tuners**

RT impedance matching

mode transformers

yttrium-iron garnet

**waveguide windows**

RT impedance matching

irises (mechanical apertures)

∞ windows

**waveguides**

GS **waveguides**

- . beam waveguides
- . circular waveguides
- . Earth-ionosphere waveguide
- . optical waveguides
- . optical fibers
- ... scintillating fibers
- . corrugated waveguides
- . dielectric waveguides
- . plasmaguides
- . rectangular waveguides

RT antenna feeds

coaxial cables

communication cables

crossed fields

electromagnetic surface waves

gyrators

irises (mechanical apertures)

microwave switching

microwave transmission

parallel plates

plastic fibers

propagation modes

Smith chart

transmission lines

waveguide filters

**wavelength division multiplexing**

DEF The process in which each modulating wave modulates a separate subcarrier and the subcarriers are spaced in wavelengths. This term is used in optical communication where wavelength usage is preferred over frequency.

GS transmission

- . multiplexing
- .. **wavelength division multiplexing**

RT code division multiplexing

demultiplexing

frequency division multiplexing

orthogonal multiplexing theory

time division multiplexing

**wavelengths**

DEF Distance in the direction of propagation of a periodic wave between two successive points at which the phase is the same (at the same time).

GS **wavelengths**

- . de Broglie wavelengths

RT antinodes

harmonics

infrared radiation

laser modes

laser outputs

longitudinal waves

maser outputs

millimeter waves

nodes (standing waves)

spectral emission

standing waves

Stokes law of radiation

## wavelet analysis

submillimeter waves  
whispering gallery modes

### wavelet analysis

(added September 1993)

UF *wavelet transform*  
RT cosine series  
Fourier analysis  
Fourier transformation  
functions (mathematics)  
Gabor transformation  
image processing  
orthonormal functions  
signal analysis  
signal encoding  
signal processing  
sine waves  
time functions  
transformations (mathematics)  
∞ waves

*wavelet transform*

USE **wavelet analysis**

### wave-particle interactions

(added July 1991)

GS particle interactions  
. **wave-particle interactions**  
wave interaction  
RT **wave-particle interactions**  
beam interactions  
electromagnetic interactions  
electrostatic waves  
magnetohydrodynamic waves  
magnetohydrodynamics  
particle acceleration  
plasma acceleration  
plasma interactions  
plasma waves  
plasma-electromagnetic interaction  
plasma-particle interactions  
space plasmas

### waveriders

GS aerodynamic configurations  
. **waveriders**  
RT airfoils  
caret wings  
delta wings  
hypersonic flight  
hypersonic vehicles  
lifting bodies

### ∞ waves

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED—CONSULT THE TERMS LISTED BELOW)  
UF *crests*  
*wave motion*  
RT baroclinic waves  
breakwaters  
cnoidal waves  
corrugating  
cylindrical waves  
detonation waves  
dilatational waves  
eikonal equation  
elastic waves  
electroacoustic waves  
electromagnetic radiation  
electromagnetic surface waves  
evanescent waves  
frontal waves  
gravitational waves  
internal waves  
ionic waves  
Kelvin waves  
kilometric waves  
littoral transport  
longitudinal waves  
nodes (standing waves)  
plane waves  
planetary waves  
refracted waves  
seismic waves  
SH waves  
shock waves  
sine waves  
sound waves  
spherical waves

square waves  
standing waves  
stress waves  
surface waves  
surges  
tidal waves  
transverse waves  
tropospheric waves  
vibration  
water waves  
waterwave energy  
wave amplification  
wave excitation  
wave fronts  
wavelet analysis

### waxes

GS **waxes**  
. ceresin  
RT alkanes  
coatings  
crude oil  
finishes  
phase change materials

### weak energy interactions

GS decay  
. **weak energy interactions**  
. . . weak interactions (field theory)  
particle interactions  
. elementary particle interactions  
. . . **weak energy interactions**  
. . . . weak interactions (field theory)  
RT beta particles  
grand unified theory  
gravitinos  
∞ interactions  
particle theory

### weak interactions (field theory)

DEF One class of the fundamental interactions among elementary particles responsible for beta decay of nuclei, and for the decay of elementary particles with lifetimes greater than about 10<sup>-10</sup> seconds such as muons, K mesons, and lambda hyperons; it is several orders of magnitude weaker than the strong and electromagnetic interactions and fails to conserve strangeness or parity. Used for beta interactions.

UF *beta interactions*  
GS decay  
. weak energy interactions  
. . **weak interactions (field theory)**  
nuclear reactions  
. nuclear interactions  
. . **weak interactions (field theory)**  
particle interactions  
. elementary particle interactions  
. . weak energy interactions  
. . . **weak interactions (field theory)**  
. nuclear interactions  
. . **weak interactions (field theory)**  
RT CP violation  
electroweak interactions (field theory)  
electroweak model  
field theory (physics)  
grand unified theory  
∞ interactions  
standard model (particle physics)  
strong interactions (field theory)  
∞ theories

### weakly interacting massive particles

(added November 1999)

DEF Hypothetical elementary particles predicted by supersymmetry theories, that interact only through gravity and weak-type interactions; postulated to account for dark matter in the Universe.

UF *cosmions*  
*WIMPs (astronomy)*  
GS particles  
. elementary particles  
. . hypothetical particles  
. . . **weakly interacting massive particles**  
RT dark matter  
missing mass (astrophysics)

solar neutrinos

### weapon system 107A-1

GS weapon systems  
. **weapon system 107A-1**

### weapon system 107A-2

GS weapon systems  
. **weapon system 107A-2**

### weapon system 133A

GS weapon systems  
. **weapon system 133A**

### weapon system 133B

GS weapon systems  
. **weapon system 133B**

### weapon system 315A

GS weapon systems  
. **weapon system 315A**

### weapon system management

GS management  
. **weapon system management**  
RT project management  
∞ systems

### weapon systems

DEF A combination of one or more weapons with all related equipment, materials, services, personnel, and means of delivery and deployment (if applicable) required for self-sufficiency.

#### GS **weapon systems**

. ground operational support system  
. laser weapons  
. missile systems  
. . Nike X systems  
. . Safeguard system  
. Sentinel system  
. Success project  
. Typhon weapon system  
. weapon system 107A-1  
. weapon system 107A-2  
. weapon system 133A  
. weapon system 133B  
. weapon system 315A

#### RT

air to surface missiles  
antiship missiles  
fire control  
Harpoon missile  
∞ military aircraft  
military spacecraft  
missile launchers  
missiles  
mobile missile launchers  
nuclear weapons  
ordnance  
∞ rockets  
space weapons  
∞ systems  
weapons  
weapons development

### weapons

#### GS **weapons**

. guns (ordnance)  
. . artillery  
. . . howitzers  
. . . precision guided projectiles  
. . rifles  
. laser weapons  
. mines (ordnance)  
. nuclear weapons  
. . fission weapons  
. . fusion weapons  
. space weapons  
. warheads  
. . nuclear warheads  
. . precision guided projectiles  
. biological weapons

#### RT

ammunition  
antiquities  
antiship warfare  
armed forces (foreign)  
armed forces (United States)  
∞ ballistic vehicles  
disarmament  
fire control  
gunnery training

military technology  
missiles  
ordnance  
Patriot missile  
projectiles  
shaped charges  
shrapnel  
tanks (combat vehicles)  
Tomahawk missiles  
torpedoes  
weapon systems  
weapons delivery  
wing-fuselage stores

**weapons delivery**

DEF Total requirements for locating the target, establishing the release conditions, and maintaining to the target (if required); includes the detection, recognition, and acquisition of the target, the weapons release as well as guidance.

GS delivery  
. **weapons delivery**  
RT air defense  
∞ aircraft  
defense program  
military technology  
missile defense  
nuclear weapons  
∞ rockets  
space weapons  
weapons

**weapons development**

GS product development  
. **weapons development**  
RT research and development  
weapon systems

**weapons industry**

GS industries  
. defense industry  
. . **weapons industry**  
RT armed forces (United States)  
military technology

**wear**

DEF Damage to a solid surface, generally involving progressive loss of material, due to relative motion between that surface and a contacting substance or substances.

RT abrasion  
chipping  
corrosion  
damage  
depreciation  
deterioration  
durability  
erosion  
failure  
flaking  
fretting corrosion  
friction  
grinding (material removal)  
hardness  
removal  
scoring  
sliding friction  
spalling  
surface finishing  
∞ surfaces  
system failures  
tribology  
wear resistance

**wear inhibitors**

GS inhibitors  
. **wear inhibitors**  
RT retardants  
wear resistance

**wear resistance**

GS mechanical properties  
. **wear resistance**  
. . abrasion resistance  
RT abrasion  
boundary lubrication  
coefficient of friction  
deterioration  
hardness

lubricant tests  
∞ resistance  
sliding friction  
toughness  
wear  
wear inhibitors  
wear tests

**wear tests**

RT cumulative damage  
destructive tests  
erosion  
ferrography  
fretting  
friction  
hardness tests  
∞ materials tests  
quality control  
spalling  
static tests  
∞ tests  
tribometers  
wear resistance

**weather**

UF *weather conditions*  
GS **weather**  
. cold weather  
. hot weather  
RT aircraft accidents  
aircraft hazards  
aircraft safety  
Alpine meteorology  
annual variations  
anvil clouds  
Atmospheric & Oceanographic Inform Sys  
atmospheric pressure  
atmospheric temperature  
cap clouds  
cirrocumulus clouds  
cirrostratus clouds  
climate  
climatology  
clouds (meteorology)  
flight hazards  
flight plans  
Global Atmospheric Research Program  
long term effects  
meteorological parameters  
meteorology  
METEOSAT satellite  
navigation aids  
precipitation (meteorology)  
runway conditions  
seasons  
solar compasses  
solar terrestrial interactions  
space weather  
wind (meteorology)

*weather charts*

USE **meteorological charts**

*weather conditions*

USE **weather**

*weather control*

USE **weather modification**

**weather data recorders**

GS data recorders  
. **weather data recorders**  
measuring instruments  
. meteorological instruments  
. . **weather data recorders**  
recording instruments  
. **weather data recorders**  
RT automatic weather stations  
∞ data  
telemetry

**weather forecasting**

GS meteorology  
. **weather forecasting**  
. . long range weather forecasting  
. . nowcasting  
. . numerical weather forecasting  
. . statistical weather forecasting

predictions  
. forecasting  
. . **weather forecasting**  
. . . long range weather forecasting  
. . . nowcasting  
. . . numerical weather forecasting  
. . . statistical weather forecasting

RT

air masses  
atmospheric models  
cirrus shields  
cloud cover  
cockpit weather information systems  
cold fronts  
environmental monitoring  
flight conditions  
flood predictions  
GARP Atlantic Tropical Experiment  
hindcasting  
humidity  
meteorological balloons  
meteorological flight  
meteorological radar  
meteorological satellites  
meteorological services  
nephelanalysis  
NOAA 19 satellite  
NPOESS  
precipitation (meteorology)  
snowstorms  
storms  
storms (meteorology)  
synoptic meteorology  
warm fronts  
wind (meteorology)

*weather fronts*

USE **fronts (meteorology)**

*weather maps*

USE **meteorological charts**

**weather modification**

UF *weather control*  
GS **weather modification**  
. cloud dispersal  
. cloud seeding  
. fog dispersal  
. lightning suppression  
. rainmaking  
. storm enhancement  
. storm suppression  
RT artificial clouds  
cloud physics  
∞ control  
environmental control  
heat islands  
snowstorms

*weather radar*

USE **meteorological radar**

**weather reconnaissance aircraft**

GS reconnaissance aircraft  
. **weather reconnaissance aircraft**  
RT ∞ aircraft  
Global Atmospheric Research Program  
meteorological instruments  
observation aircraft

**weather stations**

UF *meteorological stations*  
GS stations  
. **weather stations**  
. . automatic weather stations  
RT ground stations  
instrument packages  
integrated global ocean station systems  
meteorological instruments  
meteorological satellites  
meteorological services  
ocean data acquisitions systems

**weathering**

DEF The process of disintegration and decomposition as a consequence of exposure to the atmosphere, to chemical action, and to the action of frost water and heat.

GS exposure

## weatherproofing

### . weathering

- . . space weathering
- RT corrosion
- corrosion tests
- curing
- damage
- degradation
- deterioration
- Earth atmosphere
- erosion
- mechanical properties
- rusting
- soil erosion

### weatherproofing

- RT coatings
- cold weather
- corrosion prevention
- moisture resistance
- packaging
- preserving
- waterproofing

### weaving

- RT fabrics
- sewing
- woven composites

### web services

- (added May 2007)
- DEF A software system designed to support interoperable machine to machine interactions over a network.
- GS computer programs
- . applications programs (computers)
- . . **web services**
- services
- . **web services**
- RT internets
- on-line systems
- service oriented architecture
- World Wide Web

### web sites

- (added March 2001)
- USE **websites**

### webbing

- RT fabrics
- mesh
- ∞ webs
- webs (sheets)

### Weber test

- GS physiological tests
- . **Weber test**
- RT auditory perception
- binaural hearing

### Weber-Fechner law

DEF An approximate psychological law relating the degree of response or sensation of a sense organ and the intensity of the stimulus. The law asserts that equal increments of sensation are associated with equal increments of the logarithm of the stimulus, or that the just noticeable difference in any sensation results from a change in the stimulus which bears a constant ratio to the value of the stimulus.

- GS laws
- . **Weber-Fechner law**

### ∞ webs

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT membranes
- mesh
- webbing
- webs (sheets)
- webs (supports)

### webs (membranes)

- USE **membranes**

### webs (sheets)

- SN (EXCLUDES POLYMERIC FILMS AND STRUCTURAL REINFORCEMENTS)
- RT diaphragms (mechanics)
- elastic sheets
- fabrics

- ∞ films
- membranes
- netting (materials/structures)
- paper (material)
- papers
- ∞ rovings
- ∞ sheets
- webbing
- ∞ webs
- webs (supports)

### webs (supports)

- GS **webs (supports)**
- . girder webs
- RT diaphragms (mechanics)
- elastic sheets
- membrane structures
- membranes
- ribs (supports)
- skin (structural member)
- stiffening
- ∞ webs
- webs (sheets)

### websites

- (added March 2001)
- DEF Locations on the World Wide Web providing a collection of linked resources, usually including a homepage, and prepared and maintained as a collection of information by a person, group, or organization.
- UF *web sites*
- GS resources
- . Internet resources
- . . **websites**
- RT electronic bulletin boards
- electronic commerce
- information dissemination
- information resources management
- information systems
- internets
- on-line systems
- World Wide Web

### wedge flow

- GS fluid flow
- . **wedge flow**
- RT Blasius flow
- conical flow
- Falkner-Skan equation
- flow geometry
- laminar flow
- shock waves
- supersonic flow
- three dimensional flow
- two dimensional flow
- viscous flow

### wedges

- RT aerodynamic configurations
- airfoil profiles
- airfoils

### Weibel instability

DEF An instability of collisionless plasmas characterized by the unstable growth of transverse electromagnetic waves and large magnetic field fluctuation brought about by an anisotropic distribution of electronic velocities.

- GS dynamic characteristics
- . dynamic stability
- . . motion stability
- . . . flow stability
- . . . . magnetohydrodynamic stability
- . . . . . **Weibel instability**
- . flow characteristics
- . . flow stability
- . . . magnetohydrodynamic stability
- . . . . **Weibel instability**
- stability
- . dynamic stability
- . . motion stability
- . . . flow stability
- . . . . magnetohydrodynamic stability
- . . . . . **Weibel instability**
- RT plasma interactions

### Weibull density functions

- GS functions (mathematics)
- . probability density functions

### . Weibull density functions

- statistical analysis
- . probability density functions
- . . **Weibull density functions**
- RT exponential functions
- fatigue tests
- sampling

### Weierstrass functions

- GS analysis (mathematics)
- . real variables
- . . **Weierstrass functions**
- RT elliptic functions
- Jacobi integral

### ∞ weight

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- DEF The force exerted on a body by gravity.
- RT atomic weights
- biomass
- coefficients
- payloads
- weight (mass)

### weight (mass)

- UF *weight factors*
- GS **weight (mass)**
- . atomic weights
- . biomass
- . body weight
- . organ weight
- . structural weight
- RT center of mass
- ∞ force
- gravitation
- loads (forces)
- low molecular weights
- mascons
- mass
- molecular weight
- payloads
- pressure
- volume
- ∞ weight

### weight analysis

- RT ∞ analyzing
- NEW MOONS project
- preflight analysis
- structural weight
- systems analysis

### weight factors

- USE **weight (mass)**

### weight indicators

- UF *wind tunnel balances*
- GS measuring instruments
- . indicating instruments
- . . **weight indicators**
- . . . microbalances
- . . . . strain gage balances
- . . . . . thermobalances
- RT balance
- mechanical measurement
- pressure gages
- pressure measurement
- ∞ scale
- strain gages
- tensometers

### weight measurement

- UF *microweighing*
- RT density (mass/volume)
- hydrometers
- ∞ measurement

### weight reduction

- RT aircraft design
- materials selection
- spacecraft design
- structural design
- structural weight
- systems analysis

### weighting functions

- GS analysis (mathematics)
- . real variables
- . . measure and integration

- . . . **weighting functions**
- functions (mathematics)
- . **weighting functions**
- RT meshfree methods
- statistical mechanics
- weightless fluids**
- RT  $\infty$  fluids
- viscous fluids
- weightlessness**
- DEF A condition in which no acceleration, whether of gravity or other force, can be detected by an observer within the system in question. Used for zero gravity.
- UF *zero gravity*
- RT aerospace medicine
- artificial gravity
- astronaut performance
- $\infty$  astronautics
- bioprocessing
- blackout prevention
- body weight
- bone demineralization
- clinorotation
- containerless melts
- disorientation
- drop towers
- electrolyte metabolism
- environments
- extravehicular activity
- flight stress (biology)
- free fall
- gravitation
- gravitational effects
- intravehicular activity
- life support systems
- low weight
- lower body negative pressure
- microgravity
- neutral buoyancy simulation
- parabolic flight
- space adaptation syndrome
- space flight stress
- space manufacturing
- Space Processing Applications
- Rocket
- spaceborne experiments
- spacecraft environments
- suborbital flight
- weightlessness simulation**
- GS simulation
- . environment simulation
- . . space environment simulation
- . . . **weightlessness simulation**
- . . . . neutral buoyancy simulation
- RT clinorotation
- clinostats
- flight simulation
- head down tilt
- head up tilt
- hindlimb suspension
- Langley complex coordinator
- parabolic flight
- submerging
- tilt-table test
- Weinberg-Salam Gauge Model*
- USE **electroweak model**
- weld strength**
- GS mechanical properties
- . **weld strength**
- RT  $\infty$  strength
- weldability
- welded joints
- weld tests**
- RT fatigue tests
- $\infty$  tests
- welded joints
- weldability**
- RT brittleness
- ductility
- heat affected zone
- weld strength
- welded joints**
- GS joints (junctions)
- . metal joints
- . . **welded joints**
- . . . spot welds
- RT beads
- bonded joints
- butt joints
- friction stir welding
- lap joints
- riveted joints
- weld strength
- weld tests
- welding
- welded structures**
- GS **welded structures**
- . steel structures
- RT rigid structures
- $\infty$  structures
- welding**
- DEF Joining two or more pieces of metal by applying heat, pressure, or both, with or without filler material to produce a localized union through fusion or recrystallization across the interface.
- GS **welding**
- . fusion welding
- . . electric welding
- . . . arc welding
- . . . . gas tungsten arc welding
- . . . . plasma arc welding
- . . . . electroslag welding
- . . . . flash welding
- . . . . electron beam welding
- . . . . gas welding
- . . . . brazing
- . . . . low temperature brazing
- . . . . laser welding
- . . . . pressure welding
- . . . . cold welding
- . . . . diffusion welding
- . . . . explosive welding
- . . . . friction welding
- . . . . friction stir welding
- . . . . ultrasonic welding
- RT backups
- beads
- bonding
- construction
- fillets
- flame plating
- fluxes
- fusibility
- heat affected zone
- $\infty$  joining
- metal bonding
- metal-metal bonding
- sealing
- soldering
- torches
- welded joints
- welding machines**
- RT  $\infty$  electric equipment
- electric welding
- $\infty$  machinery
- torches
- wells**
- RT aquifers
- drilling
- ground water
- limnology
- oases
- springs (water)
- square wells
- stratigraphy
- Wentzel-Kramer-Brillouin method**
- UF *WKB approximation*
- RT de Broglie wavelengths
- $\infty$  methodology
- perturbation theory
- Plancks constant
- Schroedinger equation
- Weser aircraft**
- RT  $\infty$  aircraft
- helicopters
- rotary wing aircraft
- V/STOL aircraft
- West comet**
- DEF A comet discovered in 1976. .
- GS celestial bodies
- . comets
- . . **West comet**
- RT solar system
- West Ford project**
- GS programs
- . projects
- . . **West Ford project**
- West Germany**
- UF *Federal Republic of Germany*
- GS nations
- . **West Germany**
- RT Alps Mountains (Europe)
- Azur satellite
- Central Europe
- East Germany
- Europe
- German Infrared Laboratory
- German space program
- Germany
- West Indies**
- GS landforms
- . islands
- . . **West Indies**
- . . . Antigua and Barbuda
- . . . Bahamas
- . . . Barbados
- . . . Cuba
- . . . Dominica
- . . . Grenada
- . . . Guadeloupe
- . . . Haiti
- . . . Jamaica
- . . . Lesser Antilles
- . . . Martinique
- . . . Puerto Rico
- . . . Trinidad and Tobago
- . . . Virgin Islands
- RT Atlantic Ocean
- Caribbean region
- West Virginia**
- GS nations
- . United States
- . . **West Virginia**
- RT Allegheny Plateau (US)
- Ohio River (US)
- Potomac River Valley (MD-VA-WV)
- Westar satellites**
- GS artificial satellites
- . communication satellites
- . . **Westar satellites**
- RT point to point communication
- telecommunication
- telegraph systems
- Western hemisphere**
- RT Earth (planet)
- Eastern Hemisphere
- geography
- Westland aircraft**
- GS **Westland aircraft**
- . P-531 helicopter
- . Westland Whirlwind helicopter
- RT  $\infty$  aircraft
- helicopters
- rotary wing aircraft
- V/STOL aircraft
- Westland ground effect machines**
- UF *SR-N2 ground effect machine*
- SR-N3 ground effect machine*
- SR-N5 ground effect machine*
- Westland SR-N2 ground effect machine*

## Westland Whirlwind helicopter

*Westland SR-N2 hovercraft*  
*Westland SR-N3 ground effect machine*  
*Westland SR-N3 hovercraft*  
*Westland SR-N5 ground effect machine*

GS ground effect machines  
. **Westland ground effect machines**  
RT ∞ aircraft

*Westland MK-10 helicopter*  
USE **Westland Whirlwind helicopter**

*Westland P-531 helicopter*  
USE **P-531 helicopter**

*Westland SR-N2 ground effect machine*  
USE **Westland ground effect machines**

*Westland SR-N2 hovercraft*  
USE **Westland ground effect machines**

*Westland SR-N3 ground effect machine*  
USE **Westland ground effect machines**

*Westland SR-N3 hovercraft*  
USE **Westland ground effect machines**

*Westland SR-N5 ground effect machine*  
USE **Westland ground effect machines**

### Westland Whirlwind helicopter

UF *Westland MK-10 helicopter*  
*Whirlwind MK-10 helicopter*

GS V/STOL aircraft  
. rotary wing aircraft  
. . helicopters  
. . . military helicopters  
. . . **Westland Whirlwind helicopter**  
Westland aircraft  
. **Westland Whirlwind helicopter**  
RT ∞ aircraft

### wet cells

GS electrochemical cells  
. electric batteries  
. . **wet cells**  
RT ∞ electric cells  
electrolytes  
fuel cells  
nonaqueous electrolytes  
primary batteries

### wet spinning

DEF The production of synthetic and man-made filaments by extruding the chemical solution through spinnerets into a chemical bath where they coagulate.  
RT extruding fibers  
∞ filaments  
∞ processing  
synthetic fibers  
textiles  
wetting

### wetlands

DEF Lands which have the water table at, near, or above the land surface, or which are saturated for long enough periods to promote hydrophylic vegetation and various kinds of biological activity which are adapted to the wet environment.

GS land  
. **wetlands**  
. . marshlands  
RT coastal currents  
coastal ecology  
coastal plains  
coastal water  
environment effects  
fisheries  
marine biology  
marine environments  
marine resources  
nearshore water  
oceanography  
oil pollution  
sea grasses  
shorelines  
tides

water resources  
waterfowl  
wildlife

### wetness

USE **moisture content**

### wettability

RT adhesion  
adhesion tests  
formations  
hydrophobicity  
hygroscopicity  
permeability  
porosity  
surface properties  
wetting

### wetting

RT cooling  
dipping  
foaming  
hydrophobicity  
interfacial tension  
∞ saturation  
∞ soaking  
soaps  
spraying  
sprinkling  
submerging  
wet spinning  
wettability

### whales

GS animals  
. vertebrates  
. . mammals  
. . . marine mammals  
. . . **whales**

### wharves

UF *piers*  
RT cargo ships  
dams  
Earth resources  
freighters  
harbors  
marine technology  
materials handling  
∞ ports  
rivers  
ship terminals  
tanker ships  
terminal facilities  
water

### wheat

GS farm crops  
. grains (food)  
. . **wheat**  
RT crop growth  
crop vigor  
∞ crops  
rice

### Wheatstone bridges

GS circuits  
. electric bridges  
. . wire bridge circuits  
. . . **Wheatstone bridges**  
RT measuring instruments  
ohmmeters

### wheel brakes

GS brakes (for arresting motion)  
. **wheel brakes**  
RT aircraft brakes  
aircraft safety  
antiskid devices  
controllability  
friction  
hydraulic equipment  
landing gear  
tires  
vehicle wheels

### wheelchairs

DEF Four wheeled ambulatory devices for persons with minimal or no use of lower extremities which can be either manually or electrically

powered. They are often individually fitted.

RT disabilities  
human factors engineering  
locomotion  
ramps (structures)

### wheels

DEF Rims fitted with disks for affixment to axles.

GS **wheels**  
. counter-rotating wheels  
. flywheels  
. reaction wheels  
. toroidal wheels  
. turbine wheels  
. vehicle wheels  
. . nose wheels  
. water wheels

RT bearings  
brakes (for arresting motion)  
gears  
hubs  
landing gear  
pulleys  
rollers  
rotors  
shafts (machine elements)  
spokes  
tires

### whip antennas

DEF Thin flexible monopole antennas.

GS antennas  
. omnidirectional antennas  
. . monopole antennas  
. . . **whip antennas**  
RT radio antennas

### whiplash injuries

GS injuries  
. **whiplash injuries**  
RT back injuries  
crash injuries  
spinal cord injuries

### whirl

USE **rotation**

### whirl instability

USE **rotary stability**

### whirl towers

RT helicopter design  
hovering  
hovering stability  
parachutes  
rotary wings  
rotor aerodynamics  
spin tests

### whirling

USE **rotation**

### whirling tests

USE **spin tests**

### Whirlwind MK-10 helicopter

USE **Westland Whirlwind helicopter**

### whisker composites

UF *metal whisker reinforcement*  
GS composite materials  
. **whisker composites**  
RT aramid fiber composites  
eutectic alloys  
metal matrix composites  
reinforcing fibers

### whiskers (crystals)

GS crystals  
. **whiskers (crystals)**  
RT dendritic crystals  
fibers  
∞ filaments

### whispering gallery modes

(added September 1988)

DEF Electromagnetic (or elastic) waves that differ in frequency by more than an order of magnitude.

GS modes

- . propagation modes
- . . **whispering gallery modes**
- RT acoustic frequencies
- acoustic propagation
- electromagnetic radiation
- electromagnetic wave transmission
- wave propagation
- wavelengths
- whistler recorders**
- GS communication equipment
- . radio receivers
- . . **whistler recorders**
- radio equipment
- . radio receivers
- . . **whistler recorders**
- receivers
- . radio receivers
- . . **whistler recorders**
- recording instruments
- . **whistler recorders**
- RT sonograms
- whistlers**
- DEF Radiofrequency electromagnetic signals generated by some lightning discharges.
- GS atmospheric radiation
- . ionospheric noise
- . . **whistlers**
- electromagnetic interference
- . radio frequency interference
- . . electromagnetic noise
- . . . atmospherics
- . . . . **whistlers**
- . . . ionospheric noise
- . . . . **whistlers**
- electromagnetic radiation
- . radio waves
- . . sky waves
- . . . **whistlers**
- RT dawn chorus
- electromagnetic fields
- lightning
- microwaves
- radio signals
- sonograms
- white blood cells*
- USE **leukocytes**
- white dwarf stars**
- GS celestial bodies
- . stars
- . . early stars
- . . . hot stars
- . . . . **white dwarf stars**
- RT cataclysmic variables
- degenerate matter
- dwarf novae
- dwarf stars
- red dwarf stars
- subdwarf stars
- supernova remnants
- Wolf-Rayet stars
- white holes (astronomy)**
- DEF Time-reversed black holes, expanding sources with growing intensity and photon energy.
- GS celestial bodies
- . stars
- . . **white holes (astronomy)**
- RT black holes (astronomy)
- cosmology
- electromagnetic radiation
- event horizon
- gravitational collapse
- gravitational lenses
- light emission
- naked singularities
- supernova remnants
- white light holography**
- GS imagery
- . photography
- . . holography
- . . . **white light holography**
- RT data storage
- holographic optical elements
- wave front reconstruction
- white noise**
- DEF A sound or electromagnetic wave whose spectrum is continuous and uniform as a function of frequency. Used for spectral noise.
- UF *spectral noise*
- GS electromagnetic interference
- . radio frequency interference
- . . electromagnetic noise
- . . . **white noise**
- . . . . thermal noise
- RT electromagnetic noise measurement
- jamming
- $\infty$  noise
- noise (sound)
- noise spectra
- random noise
- signal to noise ratios
- spectral bands
- white smokers (oceanography)*
- (added April 2005)
- USE **submarine hydrothermal vents**
- whiteout**
- RT visibility
- visual flight
- Whitham rule**
- GS rules
- . **Whitham rule**
- RT shock waves
- wave propagation
- Whittaker functions**
- GS analysis (mathematics)
- . real variables
- . . **Whittaker functions**
- functions (mathematics)
- . **Whittaker functions**
- RT differential equations
- wicks**
- RT fuses (ordnance)
- wide angle lenses**
- GS lenses
- . **wide angle lenses**
- optical equipment
- . **wide angle lenses**
- RT all sky photography
- cameras
- panoramic cameras
- wide area networks**
- (added August 1995)
- UF WAN
- GS networks
- . communication networks
- . . **wide area networks**
- . computer networks
- . . **wide area networks**
- RT distributed processing
- local area networks
- packets (communication)
- telecommunication
- wideband*
- USE **broadband**
- wideband communication**
- GS telecommunication
- . **wideband communication**
- RT broadband amplifiers
- code division multiple access
- multiple access
- point to point communication
- time division multiple access
- tropospheric scattering
- Wide-field Infrared Survey Explorer**
- (added January 2010)
- DEF An unmanned satellite carrying an infrared telescope for imaging the entire sky. Successor to the Infrared Astronomical Satellite.
- UF *WISE (astronomy)*
- GS artificial satellites
- . scientific satellites
- . . astronomical satellites
- . . . **Wide-field Infrared Survey Explorer**
- observatories
- . astronomical observatories
- . . astronomical satellites
- . . . **Wide-field Infrared Survey Explorer**
- telescopes
- . spaceborne telescopes
- . . **Wide-field Infrared Survey Explorer**
- infrared astronomy
- Infrared Astronomy Satellite
- sky surveys (astronomy)
- Widmanstatten structure**
- GS crystal structure
- . **Widmanstatten structure**
- microstructure
- . **Widmanstatten structure**
- RT iron meteorites
- metallography
- meteoritic microstructures
- $\infty$  patterns
- width**
- GS dimensions
- . **width**
- RT bandwidth
- $\infty$  span
- Wiener filtering**
- RT electric filters
- optimization
- statistical analysis
- Wiener Hopf equations**
- GS analysis (mathematics)
- . functional analysis
- . . integral equations
- . . . **Wiener Hopf equations**
- RT  $\infty$  equations
- WIG vehicles*
- (added December 1999)
- USE **wing-in-ground effect vehicles**
- wiggler magnets**
- DEF Components used in the production of coherent x rays by the pumping of a gas with synchrotron radiation in combination with low energy photon beams.
- GS magnets
- . **wiggler magnets**
- reflectors
- . **wiggler magnets**
- RT diffraction radiation
- free electron lasers
- laser pumping
- tunable lasers
- Wightman theory*
- USE **field theory (physics)**
- quantum theory**
- relativistic theory**
- Wigner coefficient**
- GS coefficients
- . **Wigner coefficient**
- RT angular momentum
- quantum mechanics
- Wild 2 comet**
- (added March 1999)
- DEF Periodic comet, discovered January 1978, relatively new to the inner Solar System due to a shift in its orbit caused by the gravitational influence of Jupiter.
- GS celestial bodies
- . comets
- . . **Wild 2 comet**
- RT Stardust Mission
- wilderness**
- RT deserts
- forests
- land management
- plains
- remote regions



## wildlife

rural areas

**wildlife**

GS animals

. **wildlife**

RT birds

endangered species

environment effects

fishes

habitats

wetlands

**wildlife radiolocation**

GS tracking (position)

. radio tracking

. . **wildlife radiolocation**

RT animals

bioinstrumentation

biotelemetry

radio transmitters

remote sensors

satellite instruments

satellite observation

triangulation

**Williston Basin (North America)**

GS landforms

. structural basins

. . **Williston Basin (North America)**

RT Canada

Montana

North America

North Dakota

*WIMPs (astronomy)*  
(added November 1999)

USE **weakly interacting massive particles**

**winches**

RT cranes

elevators (lifts)

∞ lifts

pulleys

**wind (meteorology)**

DEF A natural motion of the air, especially a noticeable current of air moving in the atmosphere parallel to the Earth's surface.

GS **wind (meteorology)**

. circumpolar westerlies

. ground wind

. gusts

. monsoons

. sea breeze

. squalls

. winds aloft

. . geostrophic wind

. . jet streams (meteorology)

RT aeolian tones

aerology

air currents

air pollution

Alpine meteorology

anemometers

atmospheric circulation

barotropic flow

∞ barriers

blowing

climatology

cyclones

gravity waves

hot-film anemometers

jimsphere balloons

marine meteorology

meridional flow

mesoscale phenomena

meteorology

mixing height

pressure ice

ripples

storm damage

storms

storms (meteorology)

thunderstorms

tidal waves

tornadoes

upwelling water

vertical air currents

weather

weather forecasting

windmills (windpowered machines)

windpower utilization

windpowered generators

zonal flow (meteorology)

*wind circulation*

USE **atmospheric circulation**

**wind direction**

DEF The direction from which the wind is blowing, measured in points of the compass or in azimuth degree.

RT atmospheric circulation

ground wind

meridional flow

meteorological parameters

sea breeze

smoke trails

upstream

upwelling water

windmills (windpowered machines)

windpowered generators

zonal flow (meteorology)

**wind effects**

RT atmospheric effects

dunes

dust storms

∞ effects

erosion

ground wind

pressure effects

sea breeze

sea roughness

sea states

soil erosion

turbulence

water circulation

*wind energy*

USE **windpower utilization**

**wind erosion**

GS erosion

. **wind erosion**

RT atmospheric effects

ground wind

sea breeze

water erosion

**wind measurement**

GS mechanical measurement

. **wind measurement**

. . wind velocity measurement

RT aerodynamics

anemometers

hot-film anemometers

∞ measurement

meteorological parameters

meteorology

QuikSCAT satellite

rawinsondes

sea breeze

smoke trails

sodar

**wind pressure**

GS pressure

. **wind pressure**

RT dynamic loads

ground wind

gust loads

loads (forces)

windpower utilization

windpowered generators

**wind profiles**

RT atmospheric circulation

ground wind

∞ profiles

radial distribution

smoke trails

sodar

vertical distribution

zonal flow (meteorology)

**Wind River Range (WY)**

GS landforms

. mountains

. . **Wind River Range (WY)**

RT Wyoming

**wind shear**

DEF A sharp change in wind speed and direction over a short distance

UF *Dungeys wind shear mechanism*

RT aviation meteorology

barotropic flow

clear air turbulence

downbursts

geostrophic wind

ground wind

microbursts (meteorology)

**wind tunnel apparatus**

UF *wind tunnel balances*

GS **wind tunnel apparatus**

. wind tunnel drives

. wind tunnel nozzles

RT ∞ equipment

supersonic test apparatus

*wind tunnel balances*

USE **weight indicators**

**wind tunnel apparatus**

**wind tunnel calibration**

GS calibrating

. **wind tunnel calibration**

RT measuring instruments

pressure measurement

scaling laws

temperature measurement

**wind tunnel drives**

GS wind tunnel apparatus

. **wind tunnel drives**

RT ∞ drives

∞ fans

mechanical drives

plasma generators

pressure chambers

vacuum chambers

**wind tunnel models**

GS models

. **wind tunnel models**

. . powered models

RT aerodynamic configurations

aircraft models

dynamic models

flow visualization

∞ missile simulators

pylon mounting

scale models

semispan models

shadowgraph photography

∞ test equipment

**wind tunnel nozzles**

GS wind tunnel apparatus

. **wind tunnel nozzles**

RT conical nozzles

convergent-divergent nozzles

divergent nozzles

hypersonic nozzles

∞ nozzles

supersonic nozzles

transonic nozzles

**wind tunnel stability tests**

GS stability tests

. **wind tunnel stability tests**

RT aerodynamic stability

aircraft stability

missile tests

spacecraft stability

∞ tests

**wind tunnel tests**

RT aerodynamic characteristics

air data systems

density measurement

flow distribution

pressure measurement

∞ tests

trisonic wind tunnels

water tunnel tests

**wind tunnel walls**

- GS walls
  - . **wind tunnel walls**
- RT pressure vessels
  - reinforced shells

**wind tunnels**

DEF Tubelike structures or passages, sometimes continuous, together with their adjuncts, in which high speed movements of air or other gases are produced, as by fans, and within which objects such as engines or aircraft, airfoils, rockets (or models of these objects), are placed to investigate the airflow about them and the aerodynamic forces acting upon them.

- GS test facilities
  - . **wind tunnels**
  - .. blowdown wind tunnels
  - .. combustion wind tunnels
  - .. cryogenic wind tunnels
  - .. hypersonic wind tunnels
  - .. cascade wind tunnels
  - .. hotshot wind tunnels
  - .. plasma jet wind tunnels
  - .. shock tunnels
  - .. hypervelocity wind tunnels
  - .. cascade wind tunnels
  - .. hotshot wind tunnels
  - .. plasma jet wind tunnels
  - .. shock tunnels
  - .. low density wind tunnels
  - .. low speed wind tunnels
  - .. subsonic wind tunnels
  - .. rectangular wind tunnels
  - .. slotted wind tunnels
  - .. supersonic wind tunnels
  - .. transonic wind tunnels
  - .. trisonic wind tunnels
- RT aerodynamics
  - exhaust flow simulation
  - flight simulators
  - gas guns
  - gas streams
  - hypersonic flow
  - spikes (aerodynamic configurations)
  - supersonic flow
  - test chambers
  - ∞ test equipment
  - transonic flow
  - ∞ tunnels

**wind turbines**

DEF Machines which convert wind energy into electricity.

- GS turbomachinery
  - . turbines
  - .. **wind turbines**
  - ... tip vanes
- RT turbogenerators
  - wind velocity
  - windmills (windpowered machines)
  - windpower utilization
  - windpowered generators

**wind vanes**

- GS display devices
  - . flow direction indicators
  - .. **wind vanes**
  - measuring instruments
  - . indicating instruments
  - .. flow direction indicators
  - ... **wind vanes**
  - . meteorological instruments
  - .. **wind vanes**
  - vanes
  - . **wind vanes**
- RT anemometers
  - hot-film anemometers

**wind variations**

- GS variations
  - . **wind variations**
- RT annual variations
  - atmospheric turbulence
  - diurnal variations

seasons

**wind velocity**

- GS rates (per time)
  - . **wind velocity**
  - .. solar wind velocity
  - velocity
  - . **wind velocity**
  - .. solar wind velocity
- RT airspeed
  - anemometers
  - flow measurement
  - Fujita method
  - ground wind
  - hot-film anemometers
  - meteorological parameters
  - sea roughness
  - wind turbines
  - windmills (windpowered machines)
  - windpower utilization
  - windpowered generators

**wind velocity measurement**

- GS mechanical measurement
  - . velocity measurement
  - .. **wind velocity measurement**
  - . wind measurement
  - .. **wind velocity measurement**
- RT anemometers
  - hot-film anemometers

**Wind/GGS spacecraft**

(added January 2001)

DEF One of two NASA spacecraft in the Global Geospace Science (GGS) initiative and part of the International Solar Terrestrial Physics (ISTP) program. The main purpose of the Wind spacecraft is to measure the incoming solar wind, magnetic fields, and particles, although early in its mission Wind observed the Earth foreshock region. The spacecraft was launched in November 1994.

- GS artificial satellites
  - . geophysical satellites
  - .. **Wind/GGS spacecraft**
  - . scientific satellites
  - .. **Wind/GGS spacecraft**
- RT Earth magnetosphere
  - gamma rays
  - interplanetary magnetic fields
  - Polar/GGS spacecraft
  - solar corpuscular radiation
  - solar terrestrial interactions
  - solar wind
  - space plasmas

**winding**

- GS **winding**
  - . filament winding
  - . helical windings
  - . wire winding
- RT cold working
  - leveling
  - metal working
  - spindles
  - spiral wrapping
  - stretching
  - twisting

**windmilling**

USE **autorotation**

**windmills (windpowered machines)**

- RT electric generators
  - gears
  - ground wind
- ∞ machinery
- ∞ mechanical drives
- ∞ power transmission
- ∞ pumping
  - wind (meteorology)
  - wind direction
  - wind turbines
  - wind velocity
  - windpower utilization
  - windpowered generators

windpowered pumps

window atmosphere sounding projectile

USE **WASP sounding rocket**

∞ **windows**

- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT infrared windows
  - ports (openings)
  - waveguide windows
  - windows (apertures)
  - windows (intervals)

**windows (apertures)**

- SN (EXCLUDES INTERVALS IN TIME, FREQUENCY, ENERGY AND SO ON)
- RT apertures
  - ∞ barriers
  - curtains
  - doors
  - ducts
  - openings
  - optical materials
  - ports (openings)
  - separators
  - shielding
  - vents
  - ∞ windows
  - windshields

**windows (computer programs)**

(added July 1993)

- GS interfaces
  - . graphical user interface
  - .. **windows (computer programs)**
- RT computer graphics
  - operating systems (computers)
  - real time operation

**windows (intervals)**

- SN (EXCLUDES INTERVALS IN SPACE CONTINUUM)
- GS **windows (intervals)**
  - . laser windows
  - . launch windows
- RT bandwidth
  - burning time
  - countdown
  - energy bands
  - flight time
  - testing time
  - time measurement
  - ∞ windows

**windpower utilization**

- UF *wind energy*
- GS renewable energy
  - . **windpower utilization**
  - utilization
  - . **windpower utilization**
- RT air currents
  - air masses
  - atmospheric circulation
  - clean energy
  - Earth resources
  - ground wind
  - sea breeze
  - vanes
  - wind (meteorology)
  - wind pressure
  - wind turbines
  - wind velocity
  - windmills (windpowered machines)
  - windpowered generators
  - windpowered pumps

**windpowered generators**

- RT electric generators
- ∞ generators
  - ground wind
  - vanes
  - wind (meteorology)
  - wind direction
  - wind pressure
  - wind turbines
  - wind velocity
  - windmills (windpowered machines)

## windpowered pumps

windpower utilization

### windpowered pumps

GS pumps  
. **windpowered pumps**  
RT ponds  
∞ pumping  
reservoirs  
vanes  
water  
water resources  
windmills (windpowered machines)  
windpower utilization

### winds aloft

GS wind (meteorology)  
. **winds aloft**  
.. geostrophic wind  
.. jet streams (meteorology)  
RT circumpolar westerlies  
sea breeze  
vertical air currents

### windcreens

USE **windshields**

### windshields

UF *windcreens*  
RT aircraft compartments  
canopies  
cockpits  
environmental control  
locomotives  
shielding  
windows (apertures)

### wines

GS liquids  
. potable liquids  
.. beverages  
... **wines**  
RT vineyards

### wing camber

GS camber  
. **wing camber**  
RT cambered wings  
conical camber  
mission adaptive wings

### wing flaps

UF *jet augmented wing flaps*  
GS airfoils  
. flaps (control surfaces)  
.. **wing flaps**  
... leading edge flaps  
... leading edge slats  
... trailing edge flaps  
... vortex flaps  
brakes (for arresting motion)  
. aerodynamic brakes  
.. **wing flaps**  
... leading edge flaps  
... leading edge slats  
... trailing edge flaps  
... vortex flaps  
. aircraft brakes  
.. **wing flaps**  
... leading edge flaps  
... leading edge slats  
... trailing edge flaps  
... vortex flaps  
control surfaces  
. flaps (control surfaces)  
.. **wing flaps**  
... leading edge flaps  
... leading edge slats  
... trailing edge flaps  
... vortex flaps  
drag devices  
. aerodynamic brakes  
.. **wing flaps**  
... leading edge flaps  
... leading edge slats  
... trailing edge flaps  
... vortex flaps  
RT externally blown flaps  
jet flaps

split flaps

### wing flow method tests

RT flight tests  
fluid flow  
ground tests  
∞ methodology  
∞ tests  
transonic wind tunnels

### wing icing

USE **aircraft icing**

### wing loading

GS aerodynamic forces  
. **wing loading**  
loads (forces)  
. dynamic loads  
.. **wing loading**  
RT aerodynamic loads  
aeroelasticity  
edge loading  
force distribution  
gust loads  
leading edge thrust  
static loads  
sweep effect  
vortex flaps

### wing nacelle configurations

DEF Aerodynamic configurations involving various arrangements of wings and nacelles (over-the-wing, etc.).  
UF *nacelle wing configurations*  
GS aerodynamic configurations  
. **wing nacelle configurations**  
RT ∞ aircraft  
airframes  
externally blown flaps

### wing oscillations

GS oscillations  
. airfoil oscillations  
.. **wing oscillations**  
... wing rock  
RT aerodynamic stability  
aeroelastic research wings  
flapping  
flutter  
stable oscillations  
undamped oscillations  
unsteady aerodynamics  
vibration

### wing panels

GS panels  
. **wing panels**  
structural members  
. **wing panels**  
RT curved panels  
rectangular panels  
wings

### wing planforms

GS planforms  
. **wing planforms**  
.. channel wings  
.. infinite span wings  
.. swept forward wings  
... trapezoidal wings  
.. sweptback wings  
... arrow wings  
... delta wings  
... trapezoidal wings  
.. variable sweep wings  
RT HP-115 aircraft  
low aspect ratio wings  
monoplanes  
oblique wings  
rectangular planforms  
slender wings  
swept wings  
swing wings  
thrust distribution  
unswept wings

### wing profiles

GS airfoil profiles  
. **wing profiles**  
.. wing span

RT aerodynamic interference  
GAW-1 airfoil  
GAW-2 airfoil  
mission adaptive wings  
monoplanes  
supercritical wings  
swing wings  
wings

### wing rock

(added October 1997)

DEF A high angle-of-attack, nonlinear, dynamic phenomenon of limited cycle motion predominantly in roll.  
GS oscillations  
. airfoil oscillations  
.. wing oscillations  
... **wing rock**  
RT aerodynamic stability  
aircraft stability  
angle of attack  
delta wings  
lateral oscillation  
leading edges  
roll  
slender wings

### wing roots

RT aerodynamic configurations  
aircraft configurations  
drooped airfoils  
fairings  
∞ roots

### wing slats

USE **leading edge slats**

### wing slots

GS slots  
. **wing slots**  
RT boundary layer control  
leading edge slats  
tangential blowing  
vortex generators

### wing span

GS airfoil profiles  
. wing profiles  
.. **wing span**  
RT ∞ span  
spanwise blowing  
wings

### wing tanks

GS tanks (containers)  
. fuel tanks  
.. **wing tanks**  
RT ∞ containers  
external store separation  
external stores  
external tanks  
jettison systems  
wing-fuselage stores

### wing tip vortices

GS vortices  
. **wing tip vortices**  
RT blade-vortex interaction  
flow distortion  
horseshoe vortices  
rotating fluids

### wing tips

GS tips  
. **wing tips**  
RT airfoil profiles  
blade tips  
joined wings  
wings

### wing-body and tail configurations

(added August 1998)

USE **body-wing and tail configurations**

### wing-body configurations

(added August 1998)

USE **body-wing configurations**

### ∞ winged vehicles

SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)

- RT ∞ aircraft  
 B-1 aircraft  
 drone vehicles  
 Firebee 2 target drone aircraft  
 gliders  
 hang gliders  
 hypersonic vehicles  
 jet aircraft  
 launch vehicles  
 leading edge flaps  
 man powered aircraft  
 missiles  
 monoplanes  
 recoverable launch vehicles  
 recoverable spacecraft  
 reentry vehicles  
 research aircraft  
 rocket vehicles  
 short takeoff aircraft  
 supercritical wings  
 ultralight aircraft  
 ∞ vehicles  
 vertical takeoff aircraft  
 wings
- wing-fuselage stores**  
 UF *fuselage-wing stores*  
 RT external store separation  
 external stores  
 fuselages  
 nacelles  
 pods (external stores)  
 protuberances  
 ∞ storage  
 storage tanks  
 tanks (containers)  
 weapons  
 wing tanks
- wing-in-ground effect vehicles**  
*(added December 1999)*  
 DEF Vehicles designed to fly about half their mean chord above the surface, taking advantage of the reduced drag and increased lift caused by ground effect. These vehicles, also known as WIGs or WIGEs, normally operate above a water surface.  
 UF *ekranoplanes*  
*WIG vehicles*  
 GS ground effect machines  
 . **wing-in-ground effect vehicles**  
 RT ground effect (aerodynamics)  
 surface effect ships
- winglets**  
 DEF In aerospace engineering, small nearly vertical, winglike surfaces mounted rearward above the wing tips to reduce drag coefficients at lifting conditions.  
 RT drag reduction  
 fins  
 protuberances  
 vortex alleviation  
 vortex avoidance  
 wings
- wings**  
 UF *cantilever wings*  
 GS airfoils  
 . **wings**  
 . . aeroelastic research wings  
 . . cambered wings  
 . . caret wings  
 . . channel wings  
 . . cruciform wings  
 . . fixed wings  
 . . flexible wings  
 . . parawings  
 . . GAW-1 airfoil  
 . . GAW-2 airfoil  
 . . joined wings  
 . . low aspect ratio wings  
 . . . delta wings  
 . . . trapezoidal wings  
 . . mission adaptive wings  
 . . oblique wings  
 . . rigid wings  
 . . rotary wings  
 . . . circulation control rotors  
 . . . lifting rotors
- . . . bearingless rotors  
 . . . rigid rotors  
 . . . tilting rotors  
 . . . tip driven rotors  
 . . . x wing rotors  
 . . slender wings  
 . . . infinite span wings  
 . . supercritical wings  
 . . swept wings  
 . . . swept forward wings  
 . . . . trapezoidal wings  
 . . . sweptback wings  
 . . . . arrow wings  
 . . . . delta wings  
 . . . . trapezoidal wings  
 . . swing wings  
 . . thin wings  
 . . . infinite span wings  
 . . twisted wings  
 . . uncambered wings  
 . . ring wings  
 . . unswept wings  
 . . . infinite span wings  
 . . . rectangular wings  
 . . ring wings  
 . . variable sweep wings
- RT aircraft construction materials  
 aircraft parts  
 aircraft structures  
 airfoil fences  
 airframes  
 aspect ratio  
 blunt trailing edges  
 body-wing and tail configurations  
 body-wing configurations  
 coatings  
 control surfaces  
 drooped airfoils  
 dual wing configurations  
 leading edge flaps  
 missile components  
 porous boundary layer control  
 rotors  
 spoilers  
 wing panels  
 wing profiles  
 wing span  
 wing tips  
 ∞ winged vehicles  
 winglets
- winter**  
 GS seasons  
 . **winter**  
 RT autumn  
 cold weather  
 equinoxes  
 pressure ice  
 solstices  
 spring (season)  
 summer
- wire**  
 DEF A rod or filament of drawn or rolled metal whose length is great in comparison with the major axis of its cross section.  
 GS **wire**  
 . electric wire  
 . exploding wires  
 . guy wires  
 RT billets  
 cables (ropes)  
 ∞ coils  
 cordage  
 fasteners  
 ∞ filaments  
 flat conductors  
 jumpers  
 reinforcement (structures)  
 rods  
 wiring
- wire bridge circuits**  
 GS circuits  
 . electric bridges  
 . . **wire bridge circuits**  
 . . . Wheatstone bridges  
 RT electric wire
- exploding wires
- wire cloth**  
 UF *wire mesh*  
 RT fabrics  
 reinforcement (structures)  
 ∞ screens  
 sieves
- wire grid lenses**  
 GS lenses  
 . **wire grid lenses**  
 reticles  
 . **wire grid lenses**  
 RT ∞ grids  
 lens antennas  
 magnetic lenses  
 turnstile antennas
- wire mesh*  
 USE **wire cloth**
- wire winding**  
 GS winding  
 . **wire winding**  
 RT magnet coils  
 wiring
- wireless communication**  
 UF *carrier systems*  
 GS telecommunication  
 . **wireless communication**  
 RT aircraft communication  
 closed circuit television  
 communication satellites  
 data links  
 data transmission  
 digital spacecraft television  
 facsimile communication  
 Iridium network  
 optical communication  
 radio telemetry  
 signal transmission  
 space communication  
 spacecraft communication  
 telemetry  
 voice communication
- wiring**  
 SN (PROCESS--AS DISTINGUISHED FROM MATERIAL)  
 UF *electric wiring*  
*wiring systems*  
 RT bundles  
 circuits  
 electrical insulation  
 flat conductors  
 splicing  
 transmission lines  
 wire  
 wire winding
- wiring systems*  
 USE **wiring**
- Wisconsin**  
 GS nations  
 . United States  
 . . **Wisconsin**
- WISE (astronomy)*  
*(added January 2010)*  
 USE **Wide-field Infrared Survey Explorer**
- Wiswesser notations**  
 GS classifications  
 . indexes (documentation)  
 . . **Wiswesser notations**  
 coding  
 . **Wiswesser notations**  
 RT ∞ chemical compounds  
 ∞ chemistry  
 identifying  
 molecular structure

## Wolf-Rayet stars

∞ reference systems

*WKB approximation*

USE **Wentzel-Kramer-Brillouin method**

*wolfram*

USE **tungsten**

### Wolf-Rayet stars

DEF Very luminous, very hot (as high as 50,000K) stars whose spectra have broad emission lines (mainly He I and He II, which are presumed to originate from material ejected from the stars at very high velocities. Some W-R spectra show emission lines due to carbon CWC stars; others show emission lines due to nitrogen (WN stars). Used for W stars and W-R stars.

UF *W stars*

*W-R stars*

GS celestial bodies

. stars

. . early stars

. . . hot stars

. . . . **Wolf-Rayet stars**

RT

A stars

astrophysics

B stars

carbon stars

celestial mechanics

ejecta

helium

nitrogen

O stars

stellar envelopes

stellar luminosity

stellar mass ejection

white dwarf stars

### wolves

GS animals

. vertebrates

. . mammals

. . . **wolves**

RT

dogs

*women*

USE **females**

### wood

GS **wood**

. cork (materials)

. plywood

RT

balsa

cellulose

Masonite (trademark)

organic materials

paper (material)

plants (botany)

slivers

trees (plants)

wooden structures

### wooden structures

RT plywood

∞ structures

wood

### wool

SN (LIMITED TO ANIMAL FIBERS)

GS fabrics

. **wool**

fibers

. **wool**

RT

felts

hair

keratins

organic materials

sheep

yarns

### word processing

DEF The use of a computer, often with a CRT under full-screen control, to facilitate the recording, storage, editing, updating, and organization of information in the form of words, especially sentential information.

RT computer techniques

data processing

office automation

words (language)

### words (language)

RT

abbreviations

consonants (speech)

conversation

English language

grammars

languages

messages

orthography

phonemes

phonemics

phonetics

semantics

sentences

speech

terminology

terms

thesauri

verbal communication

voice communication

vowels

word processing

### work

GS

**work**

. physical work

RT

∞ energy

heat

horsepower

kinetic energy

occupation

physical factors

### work capacity

RT

hyperkinesia

orbital workers

physical fitness

physical work

workloads (psychophysiology)

### work functions

UF *Schottky effect*

RT electron emission

∞ functions

ionization potentials

perveance

photoelectric emission

Schottky diodes

thermionic emission

### work hardening

GS hardening (materials)

. **work hardening**

. . strain hardening

RT

cold hardening

mechanical twinning

metal working

peening

shot peening

work softening

### work softening

DEF The phenomena of a drop in the yield strength of a metal when it has been strained or cold worked at low temperature and subsequently strained at an elevated temperature to cause the dislocations to become unstable.

GS softening

. **work softening**

RT

microstructure

plastic deformation

work hardening

*Workhorse helicopter*

USE **CH-21 helicopter**

### working fluids

DEF Fluids (gas or liquid) used as the medium for the transfer of energy from one part of a system to another.

RT consumables (spacecraft)

ferrofluids

fluid power

fluid transmission lines

∞ fluids

high temperature fluids

hydraulic fluids

jet condensers

phase change materials

sulfur hexafluoride

transmission fluids

### workloads (psychophysiology)

RT

fatigue (biology)

human performance

mental performance

physical work

psychomotor performance

psychophysiology

stress (psychology)

work capacity

### work-rest cycle

GS

cycles

. **work-rest cycle**

RT

fatigue (biology)

relaxation (physiology)

### workstations

GS

stations

. **workstations**

. . crew workstations

. . . crew experiment stations

. . . crew observation stations

RT

human factors engineering

man machine systems

productivity

UNIX (operating system)

*world*

USE **Earth (planet)**

### world data centers

RT ∞ centers

∞ data

data retrieval

data storage

International Geophysical Year

libraries

transoceanic systems

### World Meteorological Organization

GS

organizations

. **World Meteorological**

**Organization**

RT

international cooperation

meteorology

United Nations

*World Weather Watch*

USE **meteorological services**

### World Wide Web

(added July 1995)

UF *WWW*

GS

networks

. communication networks

. . internets

. . . **World Wide Web**

. computer networks

. . internets

. . . **World Wide Web**

RT

computer conferencing

electronic bulletin boards

electronic commerce

information transfer

Java (programming language)

protocol (computers)

web services

websites

### worms

GS

animals

. invertebrates

. . **worms**

. . . flatworms

RT

infestation

larvae

Rotifera

### wound healing

GS

healing

. **wound healing**

RT

injuries

### woven composites

(added November 1992)

GS

composite materials

. fiber composites

- . . **woven composites**
- RT braided composites
- carbon fiber reinforced plastics
- epoxy matrix composites
- fabrics
- glass fiber reinforced plastics
- graphite-epoxy composites
- reinforcing fibers
- three dimensional composites
- weaving
- W-R stars*
- USE **Wolf-Rayet stars**
- Wrangell Mountains (AK)**
- GS landforms
- . mountains
- . . **Wrangell Mountains (AK)**
- RT Alaska
- ∞ **wrap**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT composite wrapping
- packaging
- wraparound contact solar cells*
- USE **solar cells**
- wreckage**
- RT accident investigation
- accidents
- crashes
- sabotage
- spacecraft breakup
- wrenches**
- GS tools
- . **wrenches**
- wrinkling**
- GS **wrinkling**
- . flange wrinkling
- RT buckling
- deformation
- distortion
- kinking
- ∞ ridges
- wrist**
- GS anatomy
- . musculoskeletal system
- . . joints (anatomy)
- . . . **wrist**
- RT arm (anatomy)
- hand (anatomy)
- wrought alloys**
- GS alloys
- . **wrought alloys**
- RT Rene 41
- Rene 63
- Rene 77
- Waspaloy
- WU-2 aircraft*
- USE **U-2 aircraft**
- wurtzite**
- GS chalcogenides
- . sulfides
- . . inorganic sulfides
- . . . zinc sulfides
- . . . . **wurtzite**
- minerals
- . **wurtzite**
- sulfur compounds
- . sulfides
- . . inorganic sulfides
- . . . zinc sulfides
- . . . . **wurtzite**
- zinc compounds
- . zinc sulfides
- . . **wurtzite**
- WWW*
- USE **World Wide Web**
- WWW (meteorology)*
- USE **meteorological services**
- Wyoming**
- GS nations
- . United States
- . . **Wyoming**
- RT Bighorn Mountains (MT-WY)
- Black Hills (SD-WY)
- Wind River Range (WY)
- Yellowstone National Park (ID-MT-WY)

# X

*X band*  
USE **superhigh frequencies**

## **X mesons**

GS particles  
 . elementary particles  
 . . bosons  
 . . . mesons  
 . . . . meson resonance  
 . . . . . **X mesons**  
 . . fermions  
 . . . meson resonance  
 . . . . **X mesons**  
 . . hadrons  
 . . . mesons  
 . . . . meson resonance  
 . . . . . **X mesons**  
 . nuclear particles  
 . . bosons  
 . . . mesons  
 . . . . meson resonance  
 . . . . . **X mesons**  
 resonance  
 . meson resonance  
 . . **X mesons**

## **x ray absorption**

GS energy absorption  
 . radiation absorption  
 . . electromagnetic absorption  
 . . . **x ray absorption**

RT  $\infty$  absorption  
 electron spectroscopy  
 x ray detectors

## **x ray analysis**

SN (EXCLUDES X RAY STRESS ANALYSIS)  
 GS **x ray analysis**  
 . Laue method  
 . . x ray spectroscopy

RT  $\infty$  analyzing  
 chemical analysis  
 crystallography  
 defects  
 fluoroscopy  
 lattice parameters  
 $\infty$  materials tests  
 microanalysis  
 microbeams  
 radiography  
 radiology  
 stereochemistry  
 tomography

## **x ray apparatus**

GS medical equipment  
 . **x ray apparatus**  
 . . lixiscopes  
 . . . x ray tubes

RT  $\infty$  equipment  
 radiography  
 x ray detectors

## **x ray astronomy**

GS astronomy  
 . **x ray astronomy**

RT Constellation-X  
 cosmic x rays  
 Exosat satellite  
 gamma ray astronomy  
 gamma ray bursts  
 Ginga satellite  
 Granat satellite  
 grazing incidence telescopes  
 HEAO 4  
 lixiscopes  
 radiography  
 ROSAT mission  
 SAS-3  
 Tenma satellite  
 Uhuru satellite  
 ultraviolet telescopes  
 X Ray Astrophysics Facility  
 x ray binaries  
 x ray detectors  
 x ray sources  
 x ray stars

XMM-Newton telescope

## **X Ray Astrophysics Facility**

DEF Free-flying x ray observatory that is shuttle-launched, maintainable in orbit, and retrievable. Used for Advanced X Ray Astrophysics Facility and AXAF.

UF *Advanced X Ray Astrophysics Facility*  
 AXAF  
*Chandra X Ray Astrophysics Facility*

GS artificial satellites  
 . scientific satellites  
 . . astronomical satellites  
 . . . **X Ray Astrophysics Facility**  
 observatories  
 . astronomical observatories  
 . . astronomical satellites  
 . . . **X Ray Astrophysics Facility**  
 payloads  
 . Space Shuttle payloads  
 . . **X Ray Astrophysics Facility**  
 telescopes  
 . spaceborne telescopes  
 . . **X Ray Astrophysics Facility**  
 . x ray telescopes  
 . . **X Ray Astrophysics Facility**

RT astrophysics  
 $\infty$  facilities  
 spaceborne astronomy  
 x ray astronomy  
 XMM-Newton telescope

## **x ray binaries**

DEF Bright galactic x ray sources consisting of a compact star (neutron star or black hole) accreting matter from a close companion star.

GS celestial bodies  
 . stars  
 . . double stars  
 . . . binary stars  
 . . . . **x ray binaries**  
 . . x ray stars  
 . . . **x ray binaries**  
 x ray sources  
 . x ray stars  
 . . **x ray binaries**

RT accretion disks  
 astrophysics  
 black holes (astronomy)  
 companion stars  
 cosmic x rays  
 eclipsing binary stars  
 neutron stars  
 stellar mass accretion  
 x ray astronomy  
 x rays

## **x ray density measurement**

GS density measurement  
 . **x ray density measurement**

RT flux density

## **x ray detectors**

(added April 1992)  
 GS measuring instruments  
 . radiation measuring instruments  
 . . actinometers  
 . . . **x ray detectors**

RT bolometers  
 infrared detectors  
 multi-anode microchannel arrays  
 photodiodes  
 photometers  
 radiometers  
 ultraviolet detectors  
 x ray absorption  
 x ray apparatus  
 x ray astronomy  
 x ray spectroscopy  
 x ray telescopes  
 x rays

## **x ray diffraction**

GS diffraction  
 . **x ray diffraction**

RT crystallography  
 electron diffraction  
 Laue method  
 metallography

radiography  
 x ray optics

## **x ray fluorescence**

GS emission  
 . light emission  
 . . luminescence  
 . . . fluorescence  
 . . . . **x ray fluorescence**  
 . . . photoluminescence  
 . . . . **x ray fluorescence**

RT radiography

## **x ray imagery**

DEF Reproduction of an object by means of focusing penetrating electromagnetic radiation (wavelengths ranging from 10-5 to 103 angstroms) coming from the object or reflected by the object. Analogous to infrared imagery, radar imagery and microwave imagery using the IR, radar and microwave frequencies.

GS imagery  
 . **x ray imagery**

RT imaging techniques  
 infrared imagery  
 lixiscopes  
 microwave imagery  
 radar imagery  
 radiography

## **x ray inspection**

GS inspection  
 . **x ray inspection**

RT nondestructive tests  
 radiography  
 $\infty$  tests

## **x ray irradiation**

GS irradiation  
 . **x ray irradiation**

## **x ray lasers**

GS stimulated emission devices  
 . lasers  
 . . **x ray lasers**

RT electron transitions  
 laser outputs

*X Ray Multi-Mirror Mission*  
 (added August 2000)

USE **XMM-Newton telescope**

## **x ray optics**

(added January 1994)  
 DEF The study and application of x ray properties and phenomena that are similar to the optical characteristics of visible light.

RT geometrical optics  
 grazing incidence  
 mirrors  
 $\infty$  optics  
 x ray diffraction  
 x ray telescopes  
 x rays

## **x ray scattering**

GS scattering  
 . wave scattering  
 . . electromagnetic scattering  
 . . . **x ray scattering**

RT form factors

## **x ray sources**

GS **x ray sources**  
 . x ray stars  
 . . soft gamma repeaters  
 . . . x ray binaries

RT cooling flows (astrophysics)  
 cosmic x rays  
 Exosat satellite  
 galactic bulge  
 gamma ray sources (astronomy)  
 magnetars  
 $\infty$  radiation  
 ROSAT mission  
 spectral counterparts (astronomy)  
 x ray astronomy

- x rays
  - . . Constellation-X
  - . . X Ray Astrophysics Facility
  - . . XMM-Newton telescope
- x ray spectra**
  - GS spectra
    - . radiation spectra
    - . . electromagnetic spectra
    - . . . **x ray spectra**
  - RT Ginga satellite
    - North Polar Spur (astronomy)
    - quasars
    - solar spectra
    - stellar spectra
    - Tenma satellite
    - x ray spectrometers
- X ray spectrography*
  - USE **x ray spectroscopy**
- x ray spectrometers**
  - (added October 1996)
  - GS measuring instruments
    - . spectrometers
    - . . **x ray spectrometers**
  - RT spectroscopy
    - x ray spectra
    - x ray telescopes
- X ray spectrometry*
  - USE **x ray spectroscopy**
- X Ray Spectropolarimetry Payload*
  - USE **EXPOS (Spacelab payload)**
- x ray spectroscopy**
  - UF *X ray spectrography*
    - X ray spectrometry*
  - GS spectroscopy
    - . **x ray spectroscopy**
    - x ray analysis
    - . **x ray spectroscopy**
  - RT astronomical spectroscopy
    - coordination number
  - ∞ materials tests
    - molecular spectroscopy
    - radio spectroscopy
    - radiography
    - spectroscopic analysis
    - ultraviolet spectroscopy
    - vacuum spectroscopy
    - x ray detectors
- x ray stars**
  - DEF Stars with strong emission in the x ray portion of the electromagnetic spectrum. Used for extars.
  - UF *extars*
  - GS celestial bodies
    - . stars
    - . . **x ray stars**
    - . . . soft gamma repeaters
    - . . . x ray binaries
    - x ray sources
    - . **x ray stars**
    - . . soft gamma repeaters
    - . . x ray binaries
  - RT emission spectra
    - Ginga satellite
    - neutron stars
    - radiation sources
    - stellar radiation
    - Tenma satellite
    - Uhuru satellite
    - x ray astronomy
    - x ray telescopes
    - x rays
- x ray stress analysis**
  - GS stress analysis
    - . **x ray stress analysis**
  - RT stresses
    - temperature inversions
- x ray stress measurement**
  - GS mechanical measurement
    - . stress measurement
    - . . **x ray stress measurement**
- x ray telescopes**
  - GS telescopes
    - . **x ray telescopes**
- X Ray Timing Explorer**
  - DEF An Explorer satellite planned for late 1993 or 1994 to consist of three experiments: a large area proportional counter, an all sky monitor, and a high energy x ray timing experiment. The package is designed to measure the time variability of x ray sources and broad band spectra.
  - UF *Rossi X Ray Timing Explorer*
    - RXTE (satellite)*
  - GS artificial satellites
    - . scientific satellites
    - . . Explorer satellites
    - . . . **X Ray Timing Explorer**
- x ray tubes**
  - DEF Vacuum tubes designed to produce x rays by accelerating electrons to a high velocity by means of an electrostatic field, then suddenly stopping them by collision with a target.
  - GS medical equipment
    - . x ray apparatus
    - . . **x ray tubes**
  - RT electron tubes
    - radiography
- x rays**
  - DEF Nonnuclear electromagnetic radiation of very short wavelength, lying within the interval of 0. 1 to 100 angstroms (between gamma rays, and ultraviolet radiation).
  - GS electromagnetic radiation
    - . **x rays**
    - . . cosmic x rays
    - . . solar x-rays
    - ionizing radiation
    - . **x rays**
    - . . cosmic x rays
    - . . solar x-rays
  - RT auroras
    - blackout (propagation)
    - bremsstrahlung
    - cosmic rays
    - emission spectra
    - extraterrestrial radiation
    - far ultraviolet radiation
    - gamma rays
    - monochromatic radiation
    - radiography
    - radiology
    - synchrotron radiation
    - system generated electromagnetic
      - pulses
    - x ray binaries
    - x ray detectors
    - x ray optics
    - x ray sources
    - x ray stars
- x wing rotors**
  - DEF A new VTOL concept utilizing the stopped rotor X-wing aircraft.
  - GS airfoils
    - . wings
    - . . rotary wings
    - . . . **x wing rotors**
    - rotating bodies
    - . rotors
    - . . rotary wings
    - . . . **x wing rotors**
  - RT circulation control rotors
    - ∞ rotor blades
- X-1 aircraft**
  - GS Bell aircraft
    - . **X-1 aircraft**
    - monoplanes
- X-1 aircraft**
  - . **X-1 aircraft**
  - research vehicles
  - . research aircraft
  - . . **X-1 aircraft**
  - rocket vehicles
  - . rocket planes
  - . . **X-1 aircraft**
  - supersonic aircraft
  - . **X-1 aircraft**
- RT ∞ aircraft
- X-2 aircraft**
  - GS Bell aircraft
    - . **X-2 aircraft**
    - monoplanes
    - . **X-2 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-2 aircraft**
    - rocket vehicles
    - . rocket planes
    - . . **X-2 aircraft**
    - supersonic aircraft
    - . **X-2 aircraft**
  - RT ∞ aircraft
- X-3 aircraft**
  - GS jet aircraft
    - . **X-3 aircraft**
    - McDonnell Douglas aircraft
    - . Douglas aircraft
    - . . **X-3 aircraft**
    - monoplanes
    - . **X-3 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-3 aircraft**
    - supersonic aircraft
    - . **X-3 aircraft**
  - RT ∞ aircraft
- X-5 aircraft**
  - GS Bell aircraft
    - . **X-5 aircraft**
    - jet aircraft
    - . **X-5 aircraft**
    - monoplanes
    - . **X-5 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-5 aircraft**
  - RT ∞ aircraft
- X-13 aircraft**
  - GS jet aircraft
    - . **X-13 aircraft**
    - monoplanes
    - . **X-13 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-13 aircraft**
    - Ryan aircraft
    - . **X-13 aircraft**
    - V/STOL aircraft
    - . vertical takeoff aircraft
    - . . **X-13 aircraft**
  - RT ∞ aircraft
- X-14 aircraft**
  - GS Bell aircraft
    - . **X-14 aircraft**
    - jet aircraft
    - . **X-14 aircraft**
    - monoplanes
    - . **X-14 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-14 aircraft**
    - V/STOL aircraft
    - . vertical takeoff aircraft
    - . . **X-14 aircraft**
  - RT ∞ aircraft
- X-15 aircraft**
  - GS North American aircraft
    - . **X-15 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-15 aircraft**
    - rocket vehicles



## X-17 reentry vehicle

- . rocket planes
  - . . . **X-15 aircraft**
  - supersonic aircraft
  - . **X-15 aircraft**
- RT ∞ aircraft  
XLR-99 engine

### X-17 reentry vehicle

- GS reentry vehicles
- . **X-17 reentry vehicle**
- RT rocket vehicles  
solid propellant rocket engines

### X-19 aircraft

- GS Curtiss-Wright aircraft
- . **X-19 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-19 aircraft**
  - tandem wing aircraft
  - . **X-19 aircraft**
  - V/STOL aircraft
  - . vertical takeoff aircraft
  - . . . **X-19 aircraft**
- RT ∞ aircraft

### X-20 aircraft

- UF *Dyna-Soar space glider*
- GS Boeing aircraft
- . **X-20 aircraft**
  - gliders
  - . boostglide vehicles
  - . . . **X-20 aircraft**
  - hypersonic gliders
  - . . . **X-20 aircraft**
  - hypersonic vehicles
  - . hypersonic aircraft
  - . . . hypersonic gliders
  - . . . . **X-20 aircraft**
  - lifting bodies
  - . lifting reentry vehicles
  - . . . **X-20 aircraft**
  - maneuverable spacecraft
  - . **X-20 aircraft**
  - reentry vehicles
  - . boostglide vehicles
  - . . . **X-20 aircraft**
  - maneuverable reentry bodies
  - . . . lifting reentry vehicles
  - . . . . **X-20 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-20 aircraft**
- RT aerospace planes
- ∞ aircraft
- manned spacecraft
- soft landing spacecraft

### X-21 aircraft

- GS jet aircraft
- . **X-21 aircraft**
  - monoplanes
  - . **X-21 aircraft**
  - Northrop aircraft
  - . **X-21 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-21 aircraft**
- RT ∞ aircraft
- boundary layer control
- laminar boundary layer

### X-21A aircraft

- GS jet aircraft
- . **X-21A aircraft**
  - monoplanes
  - . **X-21A aircraft**
  - Northrop aircraft
  - . **X-21A aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-21A aircraft**
- RT ∞ aircraft
- laminar flow

### X-22 aircraft

- GS Bell aircraft
- . **X-22 aircraft**
  - research vehicles
  - . research aircraft

- . . . **X-22 aircraft**
  - V/STOL aircraft
  - . vertical takeoff aircraft
  - . . . **X-22 aircraft**
- RT ∞ aircraft
- tandem wing aircraft
- tilt wing aircraft

### X-22A aircraft

- GS research vehicles
- . research aircraft
  - . . . **X-22A aircraft**
  - tandem wing aircraft
  - . **X-22A aircraft**
  - V/STOL aircraft
  - . vertical takeoff aircraft
  - . . . **X-22A aircraft**
- RT ∞ aircraft

### X-24 aircraft

- GS lifting bodies
- . lifting reentry vehicles
  - . . . **X-24 aircraft**
  - reentry vehicles
  - . maneuverable reentry bodies
  - . . . lifting reentry vehicles
  - . . . . **X-24 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-24 aircraft**
- RT ∞ aircraft

### X-29 aircraft

- RT ∞ aircraft
- swept forward wings

### X-30 vehicle

- GS aerospace vehicles
- . aerospace planes
  - . . . **X-30 vehicle**
  - hypersonic vehicles
  - . **X-30 vehicle**
  - maneuverable spacecraft
  - . aerospace planes
  - . . . **X-30 vehicle**
  - reentry vehicles
  - . recoverable spacecraft
  - . reusable spacecraft
  - . . . aerospace planes
  - . . . . **X-30 vehicle**
  - research vehicles
  - . **X-30 vehicle**
  - soft landing spacecraft
  - . aerospace planes
  - . . . **X-30 vehicle**
- RT National Aerospace Plane Program
- single stage to orbit vehicles
- ∞ spacecraft
- transatmospheric vehicles

### X-31 aircraft

- (added June 1994)
- DEF A research aircraft (single-engine, delta-wing/canard configuration) designed to demonstrate enhanced fighter maneuverability (EFM) and post-stall controllability through the use of thrust vector control at very high angle-of-attack.
- GS jet aircraft
- . **X-31 aircraft**
  - monoplanes
  - . **X-31 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-31 aircraft**
- RT ∞ aircraft
- aircraft maneuvers
- canard configurations
- fighter aircraft
- thrust vector control

### X-32 aircraft

- (added October 1998)
- DEF Experimental supersonic strike fighter developed to be configured as a conventional or short takeoff/vertical landing vehicle. Developed as part of the Joint Strike Fighter (JSF) program.
- GS Boeing aircraft
- . **X-32 aircraft**
  - jet aircraft

- . **X-32 aircraft**
- research vehicles
- . research aircraft
- . . . **X-32 aircraft**
- supersonic aircraft
- . **X-32 aircraft**
- V/STOL aircraft
- . **X-32 aircraft**

### X-33 reusable launch vehicle

- (added January 1996)
- GS launch vehicles
- . reusable launch vehicles
  - . . . **X-33 reusable launch vehicle**
- RT liquid propellant rocket engines
- recoverable launch vehicles
- reusable spacecraft
- VentureStar launch vehicle

### X-34 reusable launch vehicle

- (added January 1996)
- GS launch vehicles
- . reusable launch vehicles
  - . . . **X-34 reusable launch vehicle**
- RT air launching
- Boeing 747 aircraft
- liquid propellant rocket engines
- recoverable launch vehicles
- reusable spacecraft

### X-35 aircraft

- (added October 1998)
- DEF Experimental strike fighter incorporating a vertical lift fan for short takeoff/vertical landing capability. Developed as part of the Joint Strike Fighter (JSF) program.
- GS jet aircraft
- . **X-35 aircraft**
  - Lockheed aircraft
  - . **X-35 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-35 aircraft**
  - V/STOL aircraft
  - . **X-35 aircraft**

### X-36 aircraft

- (added March 1996)
- GS McDonnell Douglas aircraft
- . **X-36 aircraft**
  - research vehicles
  - . research aircraft
  - . . . **X-36 aircraft**
  - tailless aircraft
  - . **X-36 aircraft**
- RT ∞ aircraft
- B-2 aircraft
- flight test vehicles

### X-37 vehicle

- (added March 2000)
- DEF NASA/Boeing experimental space plane developed to demonstrate airframe, propulsion, and operations technologies for reduced-cost reusable launch vehicles. The unpiloted X-37 can be carried into orbit by the Space Shuttle or launched by an expendable rocket, and flies in both orbital and reentry environments, operating at speeds up to 25 times the speed of sound.
- GS aerospace vehicles
- . aerospace planes
  - . . . **X-37 vehicle**
  - hypersonic vehicles
  - . **X-37 vehicle**
  - maneuverable spacecraft
  - . aerospace planes
  - . . . **X-37 vehicle**
  - reentry vehicles
  - . recoverable spacecraft
  - . reusable spacecraft
  - . . . aerospace planes
  - . . . . **X-37 vehicle**
  - research vehicles
  - . **X-37 vehicle**
  - soft landing spacecraft
  - . aerospace planes
  - . . . **X-37 vehicle**
- RT reusable launch vehicles
- ∞ spacecraft

- X-40A vehicle
- X-38 crew return vehicle**  
(added December 1996)
- GS recovery vehicles
    - . **X-38 crew return vehicle**
  - RT Assured Crew Return Vehicle
    - escape capsules
    - lifeboats
    - rescue operations
    - return to Earth space flight
    - space stations
- X-40A vehicle**  
(added September 2001)
- DEF NASA/Boeing 80-percent scale model demonstrator of the X-37 pilotless space plane, intended to evaluate systems and technologies to be used in future reusable space or launch vehicles.
- GS aerospace vehicles
    - . aerospace planes
    - . . **X-40A vehicle**
    - maneuverable spacecraft
    - . aerospace planes
    - . . **X-40A vehicle**
    - reentry vehicles
    - . recoverable spacecraft
    - . . reusable spacecraft
    - . . . aerospace planes
    - . . . . **X-40A vehicle**
    - research vehicles
    - . **X-40A vehicle**
    - soft landing spacecraft
    - . aerospace planes
    - . . **X-40A vehicle**
  - RT reusable launch vehicles
    - X-37 vehicle
- X-43 vehicle**  
(added September 1999)
- DEF The experimental research vehicle of the NASA Hyper-X program designed to flight validate key propulsion and related technologies for air-breathing hypersonic aircraft.
- GS aerospace vehicles
    - . **X-43 vehicle**
    - hypersonic vehicles
    - . **X-43 vehicle**
    - research vehicles
    - . **X-43 vehicle**
  - RT hypersonic flight
    - Pegasus air-launched booster
    - supersonic combustion ramjet engines
- X-45 aircraft**  
(added February 2003)
- DEF An unmanned combat air vehicle (UCAV) demonstrator developed to test the use of such aircraft in enemy air-defense suppression and other strike missions. The vehicle was developed as part of a joint DARPA/U.S. Air Force/Boeing program.
- GS pilotless aircraft
    - . **X-45 aircraft**
    - research vehicles
    - . research aircraft
    - . . **X-45 aircraft**
    - tailless aircraft
    - . **X-45 aircraft**
  - RT Boeing aircraft
    - ∞ military aircraft
    - stealth technology
- X-248 engine**
- UF *Altair engine*
  - GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . **X-248 engine**
  - RT Blue Scout rocket vehicle
    - Scout launch vehicle
    - vanguard 2 launch vehicle
- X-254 engine**
- GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . **X-254 engine**
- RT Antares rocket vehicle  
Blue Scout rocket vehicle  
Scout launch vehicle
- X-258 engines**
- GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . **X-258 engines**
    - . . . . X-258-B1 engine
  - RT Scout launch vehicle
- X-258-B1 engine**
- GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . X-258 engines
    - . . . . **X-258-B1 engine**
- X-259 engine**
- GS engines
    - . rocket engines
    - . . solid propellant rocket engines
    - . . . **X-259 engine**
  - RT Scout launch vehicle
- X-405 engine**
- GS engines
    - . rocket engines
    - . . booster rocket engines
    - . . . **X-405 engine**
    - . . liquid propellant rocket engines
    - . . . **X-405 engine**
  - RT Vanguard project
- xanthic acids**
- GS acids
    - . **xanthic acids**
  - RT organic liquids
- xanthines**
- GS fungicides
    - . **xanthines**
    - . . caffeine
    - . . guanines
    - . . uric acid
    - nitrogen compounds
    - . **xanthines**
    - . . caffeine
    - . . guanines
    - . . uric acid
    - organic compounds
    - . cyclic compounds
    - . . heterocyclic compounds
    - . . . purines
    - . . . . **xanthines**
    - . . . . . caffeine
    - . . . . . guanines
    - . . . . . uric acid
- XB-47 aircraft*
- USE **B-47 aircraft**
- XB-70 aircraft*
- USE **B-70 aircraft**
- XBQM-180A aircraft*
- USE **VATOL aircraft**
- XC-142 aircraft**
- UF *C-142 aircraft*
  - GS Fairchild-Hiller aircraft
    - . **XC-142 aircraft**
    - jet aircraft
    - . **XC-142 aircraft**
    - Ling-Temco-Vought aircraft
    - . **XC-142 aircraft**
    - monoplanes
    - . **XC-142 aircraft**
    - Ryan aircraft
    - . **XC-142 aircraft**
    - tilt wing aircraft
    - . **XC-142 aircraft**
    - transport aircraft
    - . **XC-142 aircraft**
    - V/STOL aircraft
    - . vertical takeoff aircraft
    - . . **XC-142 aircraft**
  - RT ∞ aircraft
- turboprop engines
- xenon**
- GS chemical elements
    - . rare gases
    - . . **xenon**
    - . . . xenon isotopes
    - . . . . xenon 129
    - . . . . xenon 133
    - . . . . xenon 135
    - gases
    - . rare gases
    - . . **xenon**
    - . . . xenon isotopes
    - . . . . xenon 129
    - . . . . xenon 133
    - . . . . xenon 135
- xenon 129**
- GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . xenon isotopes
    - . . . . **xenon 129**
    - . . . . rare gases
    - . . . . xenon
    - . . . . xenon isotopes
    - . . . . . **xenon 129**
    - gases
    - . rare gases
    - . . xenon
    - . . . xenon isotopes
    - . . . . **xenon 129**
- xenon 133**
- GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . radioactive isotopes
    - . . . . **xenon 133**
    - . . . . xenon isotopes
    - . . . . . **xenon 133**
    - . . . . rare gases
    - . . . . xenon
    - . . . . xenon isotopes
    - . . . . . **xenon 133**
    - gases
    - . rare gases
    - . . xenon
    - . . . xenon isotopes
    - . . . . **xenon 133**
- xenon 135**
- GS chemical elements
    - . nuclides
    - . . isotopes
    - . . . radioactive isotopes
    - . . . . **xenon 135**
    - . . . . xenon isotopes
    - . . . . . **xenon 135**
    - . . . . rare gases
    - . . . . xenon
    - . . . . xenon isotopes
    - . . . . . **xenon 135**
    - gases
    - . rare gases
    - . . xenon
    - . . . xenon isotopes
    - . . . . **xenon 135**
- xenon chloride lasers**
- DEF Rare gas-halide lasers using XeCl as the active material.
- GS stimulated emission devices
    - . lasers
    - . . gas lasers
    - . . . rare gas-halide lasers
    - . . . . **xenon chloride lasers**
  - RT electron transitions
    - excimer lasers
    - laser materials
    - laser outputs
    - ultraviolet lasers
- xenon compounds**
- RT ∞ chemical compounds

## xenon fluoride lasers

∞ rare gas compounds

### xenon fluoride lasers

DEF Lasers using XeF as the active material.

GS stimulated emission devices

. lasers  
. gas lasers  
. rare gas-halide lasers  
. . . . **xenon fluoride lasers**

RT electron transitions

excimer lasers  
laser materials  
laser outputs

### xenon isotopes

GS chemical elements

. nuclides  
. isotopes  
. . . . **xenon isotopes**

. . . . xenon 129  
. . . . xenon 133  
. . . . xenon 135

. rare gases  
. xenon

. . . . **xenon isotopes**

. . . . xenon 129  
. . . . xenon 133  
. . . . xenon 135

gases

. rare gases  
. xenon

. . . . **xenon isotopes**

. . . . xenon 129  
. . . . xenon 133  
. . . . xenon 135

### xenon lamps

GS lighting equipment

. luminaires  
. . . . **xenon lamps**

RT arc lamps

flash lamps  
infrared radiation  
mercury lamps

### xerogels

(added July 1997)

GS gels

. **xerogels**

RT aerogels

porous materials  
silica gel  
silicon dioxide  
sol-gel processes

### xerography

GS imagery

. reproduction (copying)  
. . . . **xerography**

RT electrostatic charge

photographs  
photography

### XH-51 helicopter

UF *aerogyro helicopters*

*CL-595 helicopter*  
*H-51 helicopter*  
*Lockheed 186 helicopter*  
*Lockheed CL-595 helicopter*

GS Lockheed aircraft

. **XH-51 helicopter**  
research vehicles  
. research aircraft  
. . . . **XH-51 helicopter**  
V/STOL aircraft  
. rotary wing aircraft  
. helicopters  
. . . . rigid rotor helicopters  
. . . . **XH-51 helicopter**

### xi hyperons

GS particles

. elementary particles  
. bosons  
. mesons  
. . . . hyperons  
. . . . . **xi hyperons**  
. . . . **xi hyperons**  
. fermions

. . . baryons

. . . . hyperons

. . . . . **xi hyperons**

. hadrons

. . . baryons

. . . . hyperons

. . . . . **xi hyperons**

. mesons

. . . . hyperons

. . . . . **xi hyperons**

. nuclear particles

. bosons

. . . mesons

. . . . hyperons

. . . . . **xi hyperons**

. . . . . **xi hyperons**

*XJ-34-WE-32 engine*

USE **J-34 engine**

*XJ-79-GE-1 engine*

USE **J-79 engine**

### XLR-99 engine

GS engines

. rocket engines  
. liquid propellant rocket engines

. . . . **XLR-99 engine**

RT X-15 aircraft

*XM-6 squib*

USE **squibs**

*XM-8 squib*

USE **squibs**

### XM-33 engine

UF *TX-33-39 engine*

GS engines

. rocket engines  
. solid propellant rocket engines

. . . . **XM-33 engine**

RT Blue Scout rocket vehicle

EXOS sounding rocket  
Little Joe 2 launch vehicle  
polaris missiles  
Scout launch vehicle  
TX-354 engine

*XMM (telescope)*

(added August 2000)

USE **XMM-Newton telescope**

### XMM-Newton telescope

(added August 2000)

DEF Spaceborne x-ray telescope, launched in December 1999, providing simultaneous, high-throughput non-dispersive spectroscopic imaging (EPIC instrument), medium-resolution dispersive spectroscopy (Reflection Grating Spectrometer), and optical/UV imaging and timing from a co-aligned instrument (Optical Monitor).

UF *X Ray Multi-Mirror Mission*

*XMM (telescope)*

GS artificial satellites

. ESA satellites  
. . . . **XMM-Newton telescope**

. scientific satellites

. . . astronomical satellites

. . . . **XMM-Newton telescope**

ESA spacecraft

. ESA satellites

. . . . **XMM-Newton telescope**

observatories

. astronomical observatories

. . . astronomical satellites

. . . . **XMM-Newton telescope**

telescopes

. spaceborne telescopes

. . . . **XMM-Newton telescope**

. x ray telescopes

. . . . **XMM-Newton telescope**

RT x ray astronomy

X Ray Astrophysics Facility

### XV-3 aircraft

UF *V-3 aircraft*

GS Bell aircraft

. **XV-3 aircraft**

V/STOL aircraft

. **XV-3 aircraft**

RT ∞ aircraft

tilting rotors

### XV-4 aircraft

UF *Hummingbird aircraft*

*Lockheed XV-4A aircraft*

*V-4 aircraft*

*VZ-10 aircraft*

GS jet aircraft

. **XV-4 aircraft**

Lockheed aircraft

. **XV-4 aircraft**

monoplanes

. **XV-4 aircraft**

research vehicles

. research aircraft

. . . **XV-4 aircraft**

V/STOL aircraft

. vertical takeoff aircraft

. . . **XV-4 aircraft**

RT ∞ aircraft

### XV-5 aircraft

UF *V-5 aircraft*

*VZ-11 aircraft*

*XV-5A aircraft*

GS fan in wing aircraft

. **XV-5 aircraft**

jet aircraft

. **XV-5 aircraft**

monoplanes

. **XV-5 aircraft**

research vehicles

. research aircraft

. . . **XV-5 aircraft**

Ryan aircraft

. **XV-5 aircraft**

V/STOL aircraft

. **XV-5 aircraft**

RT ∞ aircraft

*XV-5A aircraft*

USE **XV-5 aircraft**

*XV-6A aircraft*

USE **P-1127 aircraft**

### XV-8A aircraft

GS research vehicles

. research aircraft

. . . **XV-8A aircraft**

Ryan aircraft

. **XV-8A aircraft**

utility aircraft

. **XV-8A aircraft**

V/STOL aircraft

. **XV-8A aircraft**

RT ∞ aircraft

flexible wings

### XV-9A aircraft

UF *V-9 aircraft*

GS Hughes aircraft

. **XV-9A aircraft**

jet aircraft

. **XV-9A aircraft**

research vehicles

. research aircraft

. . . **XV-9A aircraft**

V/STOL aircraft

. rotary wing aircraft

. . . helicopters

. . . . military helicopters

. . . . . **XV-9A aircraft**

RT ∞ aircraft

tip driven rotors

### XV-11A aircraft

GS research vehicles

. research aircraft

. . . **XV-11A aircraft**

V/STOL aircraft

. vertical takeoff aircraft

. . . **XV-11A aircraft**

RT ∞ aircraft

lift fans

shrouded propellers

**XV-15 aircraft**

DEF Experimental model of a tilt-rotor aircraft built by Bell Aircraft Company.

GS Bell aircraft

. **XV-15 aircraft**

V/STOL aircraft

. rotary wing aircraft

. . tilt rotor aircraft

. . . **XV-15 aircraft**

RT ∞ aircraft

helicopters

Tilt Rotor Research Aircraft Program

**x-y plotters**

GS recording instruments

. plotters

. . **x-y plotters**

RT digital to analog converters

**xylene**

DEF A mixture of Carbon 8 aromatic hydrocarbons.

GS organic compounds

. hydrocarbons

. . **xylene**

RT toluene

**xylose**

GS organic compounds

. carbohydrates

. . sugars

. . . monosaccharides

. . . . pentose

. . . . . **xylose**

# Y

*YAG (garnet)*  
USE **yttrium-aluminum garnet**

## YAG lasers

GS electronic equipment  
 . solid state devices  
 . . solid state lasers  
 . . . **YAG lasers**  
 stimulated emission devices  
 . lasers  
 . . solid state lasers  
 . . . **YAG lasers**  
 RT laser heating  
 laser materials  
 laser outputs  
 yttrium-aluminum garnet

## Yagi antennas

DEF Directional antennas used on some types of radar and radio equipment consisting of an array of elemental, single wire dipole antennas and reflectors.

GS antennas  
 . directional antennas  
 . . **Yagi antennas**  
 arrays  
 . antenna arrays  
 . . linear arrays  
 . . . endfire arrays  
 . . . . **Yagi antennas**  
 RT antenna design  
 dipole antennas  
 directors (antenna elements)  
 parasitic elements (antennas)  
 waveguide antennas

## Yak 40 aircraft

GS general aviation aircraft  
 . **Yak 40 aircraft**  
 jet aircraft  
 . **Yak 40 aircraft**  
 passenger aircraft  
 . **Yak 40 aircraft**  
 Yakovlev aircraft  
 . **Yak 40 aircraft**  
 RT ∞ aircraft

## YAK aircraft

USE **Yakovlev aircraft**

## Yakovlev aircraft

(added September 1995)  
 UF **YAK aircraft**  
 GS **Yakovlev aircraft**  
 . Yak 40 aircraft  
 RT ∞ aircraft

## Yang-Mills fields

DEF Types of fields based upon Yang-Mills theory.

RT electromagnetic fields  
 field theory (physics)  
 gauge theory  
 gravitational fields  
 perturbation theory  
 Yang-Mills theory

## Yang-Mills theory

DEF Mathematical idea for describing interactions among elementary particles which is based on the idea of gauge invariance under a non Abelian group. Used for Casimir energy.

RT field theory (physics)  
 gauge theory  
 perturbation theory  
 space-time functions  
 statistical analysis  
 supergravity  
 theoretical physics  
 ∞ theories  
 Yang-Mills fields

## yarns

RT cordage  
 cotton  
 fibers  
 ∞ rovings  
 strands  
 wool

*YAV-8B aircraft*  
 USE **Harrier aircraft**

## yaw

UF *damping in yaw*  
*fish-tailing*  
*yawmeters*  
 GS attitude (inclination)  
 . **yaw**  
 RT aerodynamic stability  
 coning motion  
 directional control  
 directional stability  
 lateral oscillation  
 ∞ motion  
 pitch (inclination)  
 roll  
 rotation  
 sideslip  
 skidding  
 turning flight  
 yawing moments

## yawing moments

DEF Moments that tend to rotate aircraft, airfoils, rockets, or spacecraft about a vertical axis.

GS moments  
 . stability derivatives  
 . . **yawing moments**  
 RT aerodynamic coefficients  
 lateral oscillation  
 moments of inertia  
 pitching moments  
 rolling moments  
 torque  
 yaw

## yawmeters

USE **attitude indicators**  
**yaw**

## Y-Ba-Cu-O superconductors

USE **YBCO superconductors**

## YBCO superconductors

(added September 1992)

UF *Y-Ba-Cu-O superconductors*

GS chalcogenides  
 . oxides  
 . . metal oxides  
 . . . mixed oxides  
 . . . . **YBCO superconductors**  
 conductors  
 . superconductors (materials)  
 . . high temperature superconductors  
 . . . **YBCO superconductors**  
 RT barium oxides  
 ceramics  
 cermets  
 copper oxides  
 cuprates  
 low temperature physics  
 superconducting films  
 superconductivity  
 thin films  
 yttrium oxides

## YC-14 aircraft

GS transport aircraft  
 . cargo aircraft  
 . . **YC-14 aircraft**  
 RT ∞ aircraft  
 Boeing aircraft  
 ∞ military aircraft

## YC-15 aircraft

USE **C-15 aircraft**

## YC-123 aircraft

USE **C-123 aircraft**

## yeast

GS plants (botany)  
 . fungi  
 . . **yeast**

RT ∞ food

## Yellowstone National Park (ID-MT-WY)

GS land  
 . parks  
 . . national parks  
 . . . **Yellowstone National Park (ID-MT-WY)**  
 RT Idaho  
 Montana  
 Wyoming

## Yemen

GS nations  
 . **Yemen**  
 RT Asia

## YF-12 aircraft

GS attack aircraft  
 . fighter aircraft  
 . . **YF-12 aircraft**  
 RT ∞ aircraft  
 aircraft design  
 ∞ interceptors  
 jet aircraft  
 ∞ military aircraft  
 reconnaissance aircraft  
 research aircraft

## YF-16 aircraft

USE **F-16 aircraft**

## YF-17 aircraft

USE **F-17 aircraft**

## YF-22 aircraft

USE **F-22 aircraft**

## YF-102 aircraft

USE **F-102 aircraft**

## YHU-1 helicopter

USE **UH-1 helicopter**

## yield

RT losses  
 output

## yield point

UF *damage threshold*  
*Luder bands*  
 GS mechanical properties  
 . plastic properties  
 . . **yield point**  
 RT microyield strength  
 Tresca flow

## yield strength

DEF The stress at which a material exhibits a specific limiting deviation from the proportionality of stress to strain. This deviation is expressed in terms of strain.

GS mechanical properties  
 . **yield strength**  
 . . load carrying capacity  
 . . microyield strength  
 RT ductile-brittle transition  
 elastic properties  
 fracture strength  
 high strength  
 J integral  
 plastic deformation  
 ∞ strength  
 stresses  
 stress-strain diagrams  
 stress-strain relationships  
 temperature inversions

## YIG (garnet)

USE **yttrium-iron garnet**

*YJ73 turbojet engine*  
 USE **J-73 engine**

*YJ-73-GE-3 engine*  
 USE **J-73 engine**

*YJ-79 engine*  
 USE **J-79 engine**

*YJ-85 engine*  
 USE **J-85 engine**

*YJ-93 engine*  
 USE **J-93 engine**

*YJ-93-GE-3 engine*  
 USE **J-93 engine**

**YLF lasers**

- (added August 1990)
- UF *yttrium lithium fluoride lasers*
- GS electronic equipment
  - . solid state devices
  - . . . semiconductor devices
  - . . . semiconductor lasers
  - . . . . **YLF lasers**
  - . . . solid state lasers
  - . . . **YLF lasers**
- stimulated emission devices
  - . lasers
  - . . semiconductor lasers
  - . . . **YLF lasers**
  - . . . solid state lasers
  - . . . **YLF lasers**
- RT infrared lasers

**YLR-91-AJ-1 engine**

- GS engines
  - . rocket engines
  - . . liquid propellant rocket engines
  - . . . **YLR-91-AJ-1 engine**
- RT Titan ICBM

**yokes**

- RT beam waveguides
- connectors
- couplers
- couples
- deflection
- directional couplers
- ferromagnetic materials
- ∞ joining
- linkages
- magnet coils

*Young modulus*

USE **modulus of elasticity**

**Young-Helmholtz theory**

- RT color vision
- photoreceptors
- ∞ theories

**youth**

- RT adults
- growth
- human beings

**yo-yo devices**

- RT angular acceleration
- gyroscopic stability
- satellite rotation
- spin
- spin reduction

**yrast state**

- (added December 2001)
- DEF An energy state in which the energy level of a nucleus is less than that of all other states with the same spin.
- GS level (quantity)
  - . energy levels
  - . . **yrast state**
- RT ground state
- nuclear spin
- nuclei (nuclear physics)

**YS-11 aircraft**

- UF *Nihon YS-11 aircraft*
- GS jet aircraft
  - . turboprop aircraft

- . . **YS-11 aircraft**
- monoplanes
- . **YS-11 aircraft**
- Nihon aircraft
- . **YS-11 aircraft**
- passenger aircraft
- . **YS-11 aircraft**
- transport aircraft
- . **YS-11 aircraft**

YSZ

USE **yttria-stabilized zirconia**

*YT-2 aircraft*

USE **T-2 aircraft**

**ytterbium**

- GS chemical elements
  - . rare earth elements
  - . . **ytterbium**
  - . . . ytterbium isotopes
- metals
  - . rare earth elements
  - . . **ytterbium**
  - . . . ytterbium isotopes

**ytterbium compounds**

- GS rare earth compounds
  - . **ytterbium compounds**
- RT ∞ chemical compounds
- ∞ metal compounds

**ytterbium isotopes**

- GS chemical elements
  - . nuclides
  - . . isotopes
  - . . . **ytterbium isotopes**
  - . rare earth elements
  - . . ytterbium
  - . . . **ytterbium isotopes**
- metals
  - . rare earth elements
  - . . ytterbium
  - . . . **ytterbium isotopes**

**yttria-stabilized zirconia**

- (added February 1994)
- UF YSZ
- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . zirconium oxides
  - . . . . **yttria-stabilized zirconia**
- zirconium compounds
  - . zirconium oxides
  - . . **yttria-stabilized zirconia**
- RT ceramics
- thin films
- yttrium oxides

**yttrium**

- GS chemical elements
  - . rare earth elements
  - . . **yttrium**
  - . . . yttrium isotopes
- metals
  - . rare earth elements
  - . . **yttrium**
  - . . . yttrium isotopes
- transition metals
  - . . **yttrium**
  - . . . yttrium isotopes

**yttrium alloys**

- GS alloys
  - . **yttrium alloys**
- RT rare earth alloys

**yttrium compounds**

- GS **yttrium compounds**
  - . yttrium oxides
  - . yttrium-aluminum garnet
  - . yttrium-iron garnet
- RT ∞ chemical compounds
- ∞ Group 3B compounds
- ∞ metal compounds

**yttrium isotopes**

- GS chemical elements
  - . nuclides

- . . isotopes
- . . . **yttrium isotopes**
- . rare earth elements
- . . yttrium
- . . . **yttrium isotopes**
- metals
  - . rare earth elements
  - . . yttrium
  - . . . **yttrium isotopes**
- transition metals
  - . . yttrium
  - . . . **yttrium isotopes**

*yttrium lithium fluoride lasers*

USE **YLF lasers**

**yttrium oxides**

- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **yttrium oxides**
- yttrium compounds
  - . **yttrium oxides**
- RT high temperature superconductors
- YBCO superconductors
- yttria-stabilized zirconia

**yttrium-aluminum garnet**

- UF *YAG (garnet)*
- GS minerals
  - . garnets
  - . . **yttrium-aluminum garnet**
- silicon compounds
  - . silicates
  - . . garnets
  - . . . **yttrium-aluminum garnet**
- yttrium compounds
  - . **yttrium-aluminum garnet**
- RT ferrites
- magnetostatic amplifiers
- YAG lasers

**yttrium-iron garnet**

- UF *YIG (garnet)*
- GS minerals
  - . garnets
  - . . **yttrium-iron garnet**
- silicon compounds
  - . silicates
  - . . garnets
  - . . . **yttrium-iron garnet**
- yttrium compounds
  - . **yttrium-iron garnet**
- RT ferrites
- magnetostatic amplifiers
- waveguide tuners

**Yugoslavia**

- GS nations
  - . **Yugoslavia**
- RT Adriatic Sea
- Bosnia and Herzegovina
- Croatia
- Europe
- Serbska Republic

*YUH-1 helicopter*

USE **UH-1 helicopter**

*YUH-60A helicopter*

USE **UH-60A helicopter**

*YUH-61A helicopter*

USE **UH-61A helicopter**

**Yukawa potential**

- RT meson-nucleon interactions
- ∞ potential

*Yukon aircraft*

USE **CL-44 aircraft**

**Yukon Territory**

- GS nations
  - . Canada
  - . . **Yukon Territory**

# Z

*Z1 truss structure*  
(added October 2000)  
USE **Integrated Truss Structure Z1**

**Z-37 aircraft**  
UF *Omnipol Z-37 aircraft*  
GS monoplanes  
  . **Z-37 aircraft**  
  utility aircraft  
  . **Z-37 aircraft**

*Zaire*  
(added November 1997)  
USE **Democratic Republic of Congo**

**Zambia**  
GS nations  
  . **Zambia**  
RT Africa

**Zarya control module**  
(added November 1998)  
DEF Component of the International Space Station providing propulsion, steering, and communications during the early assembly stages of the station; later serving as a docking port and fuel tank. Zarya was built by Russia under contract to the U.S. and is owned by the U.S.  
GS modules  
  . space station modules  
  . . **Zarya control module**  
RT International Space Station

*zea mays*  
(added August 2004)  
USE **corn**

**Zeeman effect**  
RT  $\infty$  effects  
  magnetic fields  
  spectroscopy  
  spectrum analysis  
  Stark effect  
  Voigt effect

**zeitgebers**  
(added December 2001)  
DEF Environmental cues that help keep circadian and other biological rhythms; includes sunlight, noise, social interactions, and the use of clocks.  
GS cues  
  . **zeitgebers**  
RT activity cycles (biology)  
  circadian rhythms  
  darkness  
  desynchronization (biology)  
  phenology  
  physiological responses  
  rhythm (biology)  
 $\infty$  stimuli  
  visual stimuli

*Zener diodes*  
USE **avalanche diodes**

**Zener effect**  
RT barrier layers  
  carrier density (solid state)  
 $\infty$  carriers  
 $\infty$  effects  
  electric discharges  
  field emission

**Zenit launch vehicles**  
(added January 1999)  
GS launch vehicles  
  . **Zenit launch vehicles**  
RT sea launching  
  Ukrainian space program

**zenith**  
DEF That point of the celestial sphere vertically overhead. The point 180 deg. from the zenith is called the nadir.  
RT antipodes  
  apexes  
  celestial sphere  
  maxima

noon  
solar position

**zeolites**  
GS silicon compounds  
  . silicates  
  . . . **zeolites**  
RT ion exchange resins  
  minerals

**zero angle of attack**  
GS geometry  
  . Euclidean geometry  
  . . angles (geometry)  
  . . . angle of attack  
  . . . . **zero angle of attack**

*zero crossings*  
USE **roots of equations**

**zero force curves**  
RT curvature  
 $\infty$  curves  
 $\infty$  force

*zero gravity*  
USE **weightlessness**

**zero lift**  
GS aerodynamic characteristics  
  . lift  
  . . **zero lift**  
  aerodynamic forces  
  . lift  
  . . **zero lift**  
  dynamic characteristics  
  . lift  
  . . **zero lift**  
RT aerodynamic stalling  
  boundary layer separation  
  distribution (property)

**zero point energy**  
DEF Kinetic energy retained by molecules of a substance at a temperature of absolute zero.  
RT absolute zero  
  field theory (physics)  
  kinetic energy  
  thermodynamic properties

**zero power reactor 2**  
GS nuclear reactors  
  . liquid cooled reactors  
  . . water cooled reactors  
  . . . heavy water reactors  
  . . . . **zero power reactor 2**  
  . . . zero power reactors  
  . . . . **zero power reactor 2**  
  . nuclear research and test reactors  
  . . **zero power reactor 2**

**zero power reactor 3**  
GS nuclear reactors  
  . liquid cooled reactors  
  . . water cooled reactors  
  . . . zero power reactors  
  . . . . **zero power reactor 3**  
  . nuclear research and test reactors  
  . . **zero power reactor 3**

**zero power reactor 6**  
GS nuclear reactors  
  . liquid cooled reactors  
  . . water cooled reactors  
  . . . zero power reactors  
  . . . . **zero power reactor 6**  
  . nuclear research and test reactors  
  . . **zero power reactor 6**

**zero power reactor 9**  
GS nuclear reactors  
  . liquid cooled reactors  
  . . water cooled reactors  
  . . . zero power reactors  
  . . . . **zero power reactor 9**  
  . nuclear research and test reactors

. . **zero power reactor 9**

**zero power reactors**  
UF *ZPR reactors*  
GS nuclear reactors  
  . liquid cooled reactors  
  . . water cooled reactors  
  . . . **zero power reactors**  
  . . . . zero power reactor 2  
  . . . . zero power reactor 3  
  . . . . zero power reactor 6  
  . . . . zero power reactor 9

**zero sound**  
GS acoustic properties  
  . sound intensity  
  . . **zero sound**  
  rates (per time)  
  . flux density  
  . . sound intensity  
  . . . **zero sound**  
RT acoustic attenuation  
  acoustics  
  anechoic chambers  
  reflection  
  silencers  
  subaudible frequencies

**zero sum games**  
(added October 1998)  
GS games  
  . **zero sum games**  
RT differential games  
  Markov processes  
  optimal control  
  pursuit-evasion games  
  saddle points (game theory)

*zero-g ACPL (Spacelab)*  
USE **Atmospheric Cloud Physics Lab (Spacelab)**

**Zeta Aurigae star**  
GS celestial bodies  
  . stars  
  . . double stars  
  . . . binary stars  
  . . . . eclipsing binary stars  
  . . . . . **Zeta Aurigae star**  
RT Auriga constellation

**zeta pinch**  
DEF Type of plasma pinch produced by an electric current applied axially to a plasma cylinder in a controlled fusion reactor.  
GS pinch effect  
  . plasma pinch  
  . . **zeta pinch**  
RT controlled fusion  
  magnetohydrodynamic stability  
  plasma compression  
  plasma control  
  plasma electrodes  
  plasma focus  
  Q devices  
  rotating plasmas  
  screw pinch  
  theta pinch

**zeta thermonuclear reactor**  
RT pinch effect  
  thermonuclear power generation  
  thermonuclear reactions

*Zeus missile*  
USE **Nike-Zeus missile**

**Ziegler catalyst**  
GS catalysts  
  . **Ziegler catalyst**  
RT polymerization

**Zimbabwe**  
UF *Rhodesia*  
GS nations  
  . **Zimbabwe**

- RT Africa
- zinc**
- GS chemical elements
- . zinc
  - . . zinc isotopes
  - metals
  - . transition metals
  - . . **zinc**
  - . . . zinc isotopes
- RT heavy metals
- zinc alloys**
- GS alloys
- . **zinc alloys**
- RT bearing alloys  
solders
- zinc antimonides**
- GS antimony compounds
- . antimonides
  - . . **zinc antimonides**
  - zinc compounds
  - . **zinc antimonides**
- zinc chlorides**
- DEF Reaction products of hydrochloric acid and zinc; white crystals soluble in water and alcohol and with a melting point of 290 degrees C.
- GS halogen compounds
- . chlorine compounds
  - . . chlorides
  - . . . **zinc chlorides**
  - . halides
  - . . chlorides
  - . . . **zinc chlorides**
  - . . metal halides
  - . . . **zinc chlorides**
  - zinc compounds
  - . **zinc chlorides**
- zinc coatings**
- UF *galvanizing*
- GS coatings
- . metal coatings
  - . . **zinc coatings**
- RT protective coatings
- zinc compounds**
- GS **zinc compounds**
- . zinc antimonides
  - . zinc chlorides
  - . zinc fluorides
  - . zinc oxides
  - . zinc selenides
  - . zinc sulfides
  - . . wurtzite
  - . . zinblend
  - . zinc tellurides
  - . zinc tungstates
- RT ∞ chemical compounds  
∞ Group 2B compounds  
∞ metal compounds
- zinc fluorides**
- GS halogen compounds
- . fluorine compounds
  - . . fluorides
  - . . . metal fluorides
  - . . . . **zinc fluorides**
  - . halides
  - . . fluorides
  - . . . metal fluorides
  - . . . . **zinc fluorides**
  - . . metal halides
  - . . . metal fluorides
  - . . . . **zinc fluorides**
  - zinc compounds
  - . **zinc fluorides**
- zinc isotopes**
- GS chemical elements
- . nuclides
  - . . isotopes
  - . . . **zinc isotopes**
  - . zinc
  - . . **zinc isotopes**
  - metals
  - . transition metals
- . . zinc
  - . . . **zinc isotopes**
- zinc nickel batteries**
- USE **nickel zinc batteries**
- zinc oxides**
- GS chalcogenides
- . oxides
  - . . metal oxides
  - . . . **zinc oxides**
  - zinc compounds
  - . **zinc oxides**
- zinc selenides**
- GS chalcogenides
- . selenides
  - . . **zinc selenides**
  - selenium compounds
  - . selenides
  - . . **zinc selenides**
  - zinc compounds
  - . **zinc selenides**
- RT Schottky diodes
- zinc silver batteries**
- USE **silver zinc batteries**
- zinc silver oxide batteries**
- USE **silver zinc batteries**
- zinc sulfides**
- GS chalcogenides
- . sulfides
  - . . inorganic sulfides
  - . . . **zinc sulfides**
  - . . . . wurtzite
  - . . . . zinblend
  - sulfur compounds
  - . sulfides
  - . . inorganic sulfides
  - . . . **zinc sulfides**
  - . . . . wurtzite
  - . . . . zinblend
  - zinc compounds
  - . **zinc sulfides**
  - . . wurtzite
  - . . zinblend
- zinc tellurides**
- GS chalcogenides
- . tellurides
  - . . **zinc tellurides**
  - tellurium compounds
  - . tellurides
  - . . **zinc tellurides**
  - zinc compounds
  - . **zinc tellurides**
- zinc tungstates**
- GS tungsten compounds
- . tungstates
  - . . **zinc tungstates**
  - zinc compounds
  - . **zinc tungstates**
- zinblend**
- DEF Zinc sulfide, ZnS; a cubic crystal. Used for sphalerite.
- UF *sphalerite*
- GS chalcogenides
- . sulfides
  - . . inorganic sulfides
  - . . . zinc sulfides
  - . . . . **zinblend**
  - minerals
  - . **zinblend**
  - sulfur compounds
  - . sulfides
  - . . inorganic sulfides
  - . . . zinc sulfides
  - . . . . **zinblend**
  - zinc compounds
  - . zinc sulfides
  - . . **zinblend**
- zinc-bromide batteries**
- DEF Electric cells in which during charge, zinc is plated on the anode and bromine is evolved at the cathode. The bromine is transferred to an external chamber for mixing and storing with an organic liquid complexing oil. During discharge, the zinc is oxidized at the anode and the complexed bromine is reduced at the cathode.
- GS electrochemical cells
- . electric batteries
  - . . storage batteries
  - . . . **zinc-bromide batteries**
- RT zinc-chlorine batteries
- zinc-chlorine batteries**
- DEF Candidate electric cells under development for electric vehicles.
- GS electrochemical cells
- . electric batteries
  - . . storage batteries
  - . . . **zinc-chlorine batteries**
- RT zinc-bromide batteries
- zinc-oxygen batteries**
- GS electric generators
- . direct power generators
  - . . primary batteries
  - . . . metal air batteries
  - . . . . **zinc-oxygen batteries**
  - electrochemical cells
  - . electric batteries
  - . . primary batteries
  - . . . metal air batteries
  - . . . . **zinc-oxygen batteries**
- zippers**
- DEF Slide fasteners consisting of interlockable elements each attached to one of the opposing edges of two tapes and a movable part called a 'slider' that spans the interlockable elements, which when moved in one direction causes the elements one one tape to interlock with the elements on the other tape, and when moved in the opposite direction causes the elements to disengage.
- GS fasteners
- . **zippers**
- RT holders
- Zircaloy 2 (trademark)**
- GS alloys
- . zirconium alloys
  - . . Zircaloys (trademark)
  - . . . **Zircaloy 2 (trademark)**
- Zircaloys (trademark)**
- GS alloys
- . zirconium alloys
  - . . **Zircaloys (trademark)**
  - . . . Zircaloy 2 (trademark)
- RT iron alloys  
tin alloys
- zirconates**
- GS zirconium compounds
- . **zirconates**
  - . . barium zirconates
  - . . strontium zirconates
- zirconia*
- USE **zirconium oxides**
- zirconium**
- GS chemical elements
- . **zirconium**
  - . . zirconium isotopes
  - . . . zirconium 95
  - metals
  - . transition metals
  - . . **zirconium**
  - . . . zirconium isotopes
  - . . . . zirconium 95
- zirconium 95**
- GS chemical elements
- . nuclides
  - . . isotopes
  - . . . radioactive isotopes
  - . . . . **zirconium 95**
  - . . . . zirconium isotopes
  - . . . . **zirconium 95**
  - . zirconium
  - . . zirconium isotopes



## zirconium alloys

- . . . **zirconium 95**
- metals
- . transition metals
- . . zirconium
- . . . zirconium isotopes
- . . . . **zirconium 95**

### zirconium alloys

- GS alloys
  - . **zirconium alloys**
  - . . Zircalloys (trademark)
  - . . . Zircaloy 2 (trademark)
- RT hafnium alloys
- lithium alloys

### zirconium carbides

- GS carbon compounds
  - . carbides
  - . . **zirconium carbides**
- zirconium compounds
- . **zirconium carbides**

### zirconium compounds

- GS **zirconium compounds**
  - . zirconates
  - . . barium zirconates
  - . . strontium zirconates
  - . zirconium carbides
  - . zirconium hydrides
  - . zirconium iodides
  - . zirconium nitrides
  - . zirconium oxides
  - . . yttria-stabilized zirconia
  - . zirconium titanates
  - . . lead zirconate titanates
  - . zirconium fluorides
- RT ∞ chemical compounds
- ∞ Group 4B compounds
- ∞ metal compounds

### zirconium fluorides

(added April 2004)

- GS halogen compounds
  - . fluorine compounds
  - . . fluorides
  - . . . metal fluorides
  - . . . . **zirconium fluorides**
  - . halides
  - . . fluorides
  - . . . metal fluorides
  - . . . . **zirconium fluorides**
  - . . metal halides
  - . . . metal fluorides
  - . . . . **zirconium fluorides**
- zirconium compounds
- . **zirconium fluorides**

### zirconium hydrides

- GS hydrogen compounds
  - . hydrides
  - . . **zirconium hydrides**
- zirconium compounds
- . **zirconium hydrides**

### zirconium iodides

- GS halogen compounds
  - . halides
  - . . metal halides
  - . . . **zirconium iodides**
  - . iodine compounds
  - . . iodides
  - . . . **zirconium iodides**
- zirconium compounds
- . **zirconium iodides**

### zirconium isotopes

- GS chemical elements
  - . nuclides
  - . . isotopes
  - . . . **zirconium isotopes**
  - . . . . zirconium 95
  - . zirconium
  - . . **zirconium isotopes**
  - . . . zirconium 95
- metals
- . transition metals
- . . zirconium
- . . . **zirconium isotopes**

- . . . . zirconium 95

### zirconium nitrides

- GS nitrogen compounds
  - . nitrides
  - . . metal nitrides
  - . . . **zirconium nitrides**
- zirconium compounds
- . **zirconium nitrides**

### zirconium oxides

- UF *zirconia*
- GS chalcogenides
  - . oxides
  - . . metal oxides
  - . . . **zirconium oxides**
  - . . . . yttria-stabilized zirconia
- zirconium compounds
- . **zirconium oxides**
- . . yttria-stabilized zirconia

### zirconium titanates

- GS titanium compounds
  - . titanates
  - . . **zirconium titanates**
  - . . . lead zirconate titanates
- zirconium compounds
- . **zirconium titanates**
- . . lead zirconate titanates

### zodiac

- RT constellations
  - ecliptic
  - Scorpius constellation
  - Scutum constellation

### zodiacal dust

- GS celestial bodies
  - . meteoroids
  - . . micrometeoroids
  - . . . meteoroid dust clouds
  - . . . . **zodiacal dust**
  - extraterrestrial matter
    - . interstellar matter
    - . . cosmic dust
    - . . . interplanetary dust
    - . . . . meteoroid dust clouds
    - . . . . . **zodiacal dust**
  - media
    - . interplanetary medium
    - . . interplanetary dust
    - . . . meteoroid dust clouds
    - . . . . **zodiacal dust**
  - particles
    - . dust
    - . . cosmic dust
    - . . . interplanetary dust
    - . . . . meteoroid dust clouds
    - . . . . . **zodiacal dust**
- RT Explorer satellites
- micrometeorites
- Poynting-Robertson effect
- terrestrial dust belt

### zodiacal light

- GS electromagnetic radiation
  - . light (visible radiation)
  - . . **zodiacal light**
  - extraterrestrial radiation
    - . **zodiacal light**
- RT gegenschein
- Helios Project
- micrometeoroids
- night sky
- polarized light
- Poynting-Robertson effect
- sky brightness
- solar radiation
- sunlight

### zonal circulation

- USE **zonal flow (meteorology)**

### Zonal Earth Energy Budget Experiment

- USE **LZEEBE satellite**

### zonal flow (meteorology)

DEF The flow of air along a latitude circle; more specifically, the latitudinal (east or west) of existing flow. Used for zonal circulation.

- UF *zonal circulation*
- GS circulation
  - . atmospheric circulation
  - . . **zonal flow (meteorology)**
- RT air currents
  - annual variations
  - baroclinic instability
  - baroclinic waves
  - circumpolar westerlies
  - climatology
  - intertropical convergent zones
  - jet streams (meteorology)
  - Madden-Julian Oscillation
  - meridional flow
  - meteorology
  - middle atmosphere
  - mixing height
  - planetary waves
  - quasi-biennial oscillation
  - wind (meteorology)
  - wind direction
  - wind profiles

### zonal harmonics

- GS analysis (mathematics)
  - . functional analysis
  - . . harmonic analysis
  - . . . **zonal harmonics**
- harmonics
- . **zonal harmonics**

### Zond 1 space probe

- GS interplanetary spacecraft
  - . Venus probes
  - . . **Zond 1 space probe**
- Zond space probes
  - . . **Zond 1 space probe**
- Soviet spacecraft
  - . Zond space probes
  - . . **Zond 1 space probe**
- unmanned spacecraft
  - . space probes
  - . . Venus probes
  - . . . **Zond 1 space probe**
- Zond space probes
  - . . **Zond 1 space probe**

### Zond 2 space probe

- GS interplanetary spacecraft
  - . Mars probes
  - . . **Zond 2 space probe**
- Zond space probes
  - . . **Zond 2 space probe**
- Soviet spacecraft
  - . Zond space probes
  - . . **Zond 2 space probe**
- unmanned spacecraft
  - . space probes
  - . . Mars probes
  - . . . **Zond 2 space probe**
- Zond space probes
  - . . **Zond 2 space probe**

### Zond 3 space probe

- GS interplanetary spacecraft
  - . Venus probes
  - . . **Zond 3 space probe**
- Zond space probes
  - . . **Zond 3 space probe**
- Soviet spacecraft
  - . Zond space probes
  - . . **Zond 3 space probe**
- unmanned spacecraft
  - . space probes
  - . . Venus probes
  - . . . **Zond 3 space probe**
- Zond space probes
  - . . **Zond 3 space probe**

### Zond 4 space probe

- GS interplanetary spacecraft
  - . Venus probes
  - . . **Zond 4 space probe**
- Zond space probes
  - . . **Zond 4 space probe**
- Soviet spacecraft
  - . Zond space probes
  - . . **Zond 4 space probe**
- unmanned spacecraft
  - . space probes

- .. Venus probes
- ... **Zond 4 space probe**
- . Zond space probes
- .. **Zond 4 space probe**
- Zond 5 space probe**
- GS interplanetary spacecraft
- . Venus probes
- ... **Zond 5 space probe**
- . Zond space probes
- .. **Zond 5 space probe**
- Soviet spacecraft
- . Zond space probes
- .. **Zond 5 space probe**
- unmanned spacecraft
- . space probes
- .. Venus probes
- ... **Zond 5 space probe**
- . Zond space probes
- .. **Zond 5 space probe**
- Zond 6 space probe**
- GS interplanetary spacecraft
- . Venus probes
- ... **Zond 6 space probe**
- . Zond space probes
- .. **Zond 6 space probe**
- Soviet spacecraft
- . Zond space probes
- .. **Zond 6 space probe**
- unmanned spacecraft
- . space probes
- .. Venus probes
- ... **Zond 6 space probe**
- . Zond space probes
- .. **Zond 6 space probe**
- Zond 7 space probe**
- GS interplanetary spacecraft
- . Venus probes
- ... **Zond 7 space probe**
- . Zond space probes
- .. **Zond 7 space probe**
- Soviet spacecraft
- . Zond space probes
- .. **Zond 7 space probe**
- unmanned spacecraft
- . space probes
- .. Venus probes
- ... **Zond 7 space probe**
- . Zond space probes
- .. **Zond 7 space probe**
- Zond 8 space probe**
- GS interplanetary spacecraft
- . Venus probes
- ... **Zond 8 space probe**
- . Zond space probes
- .. **Zond 8 space probe**
- Soviet spacecraft
- . Zond space probes
- .. **Zond 8 space probe**
- unmanned spacecraft
- . space probes
- .. Venus probes
- ... **Zond 8 space probe**
- . Zond space probes
- .. **Zond 8 space probe**
- Zond space probes**
- GS interplanetary spacecraft
- . **Zond space probes**
- .. Zond 1 space probe
- .. Zond 2 space probe
- .. Zond 3 space probe
- .. Zond 4 space probe
- .. Zond 5 space probe
- .. Zond 6 space probe
- .. Zond 7 space probe
- .. Zond 8 space probe
- Soviet spacecraft
- . **Zond space probes**
- .. Zond 1 space probe
- .. Zond 2 space probe
- .. Zond 3 space probe
- .. Zond 4 space probe
- .. Zond 5 space probe
- .. Zond 6 space probe
- .. Zond 7 space probe
- .. Zond 8 space probe

- unmanned spacecraft
- . **Zond space probes**
- .. Zond 1 space probe
- .. Zond 2 space probe
- .. Zond 3 space probe
- .. Zond 4 space probe
- .. Zond 5 space probe
- .. Zond 6 space probe
- .. Zond 7 space probe
- .. Zond 8 space probe
- RT Mars probes
- zone melting**
- UF *zone refining*
- GS phase transformations
- . freezing
- .. **zone melting**
- . melting
- .. **zone melting**
- RT arc melting
- crystallization
- float zones
- purification
- refining
- ∞ separation
- ultrapure metals
- vacuum melting

- zone refining*
- USE **zone melting**

- zones*
- USE **regions**

- ∞ **zoology**
- SN (USE OF A MORE SPECIFIC TERM IS RECOMMENDED--CONSULT THE TERMS LISTED BELOW)
- RT animals
- botany
- entomology
- ∞ science
- taxonomy

- zoom lenses**
- GS lenses
- . **zoom lenses**
- RT lens design

- zooplankton**
- DEF The aggregate of passively floating or drifting animal organisms in aquatic ecosystems.
- GS animals
- . **zooplankton**
- plankton
- . **zooplankton**
- RT marine biology
- phytoplankton

- ZPR reactors*
- USE **zero power reactors**

- Zuni rocket vehicle**
- GS rocket vehicles
- . single stage rocket vehicles
- .. **Zuni rocket vehicle**
- RT solid propellant rocket engines

- Zvezda Service Module*
- (added June 2000)
- USE **Service Module (ISS)**

- zwitterionic compounds*
- (added October 2001)
- USE **zwitterions**

- zwitterions**
- (added October 2001)
- DEF Ionic compounds that include both positive- and negative-charge components but are neutral overall.
- UF *dipolar ions*
- zwitterionic compounds*
- RT amino acids
- ∞ chemical compounds
- ∞ dipoles
- electric dipoles
- polarization characteristics
- polymerization

- surfactants

- zygotes**
- (added August 2004)
- DEF The fertilized ovum resulting from the fusion of a male and female gamete.
- GS cells (biology)
- . gametocytes
- .. eggs
- ... **zygotes**
- RT embryos
- females
- fertility
- fertilization
- reproduction (biology)
- sex
- spermatozoa

# Report Documentation Page

1. Report No. NASA/SP-2012-7501/VOL1		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle NASA Thesaurus Volume 1 – Hierarchical Listing With Definitions			5. Report Date January 2012		
			6. Performing Organization Code		
7. Author(s)			8. Performing Organization Report No.		
9. Performing Organization Name and Address NASA Scientific and Technical Information Program Office			10. Work Unit No.		
			11. Contract or Grant No.		
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681			13. Type of Report and Period Covered Special Publication		
			14. Sponsoring Agency Code		
15. Supplementary Notes  2012 Edition					
16. Abstract  The <i>NASA Thesaurus</i> contains the authorized subject terms by which the documents in the NASA Aeronautics and Space Database are indexed and retrieved. The scope of this controlled vocabulary includes not only aerospace engineering, but all supporting areas of engineering and physics, the natural space sciences (astronomy, astrophysics, planetary science), Earth sciences, and to some extent, the biological sciences. <i>Volume 1 – Hierarchical Listing With Definitions</i> contains over 18,300 subject terms, 4,300 definitions, and approximately 4,500 USE cross references. The hierarchical listing presents full hierarchical structure for each term along with related term lists, and can serve as an orthographic authority. <i>Volume 2 – Rotated Term Display</i> is a ready-reference tool which provides approximately 52,000 additional 'access points' to the thesaurus terminology. It contains postable and nonpostable terms found in the hierarchical listing arranged in a KWIC (key-word-in-context) index.					
17. Key Words (Suggested by Author(s)) Thesauri Terminology Information Retrieval KWIC indexes Aerospace Sciences			18. Distribution Statement Unclassified – Unlimited Subject Category – 82		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages	
				22. Price	