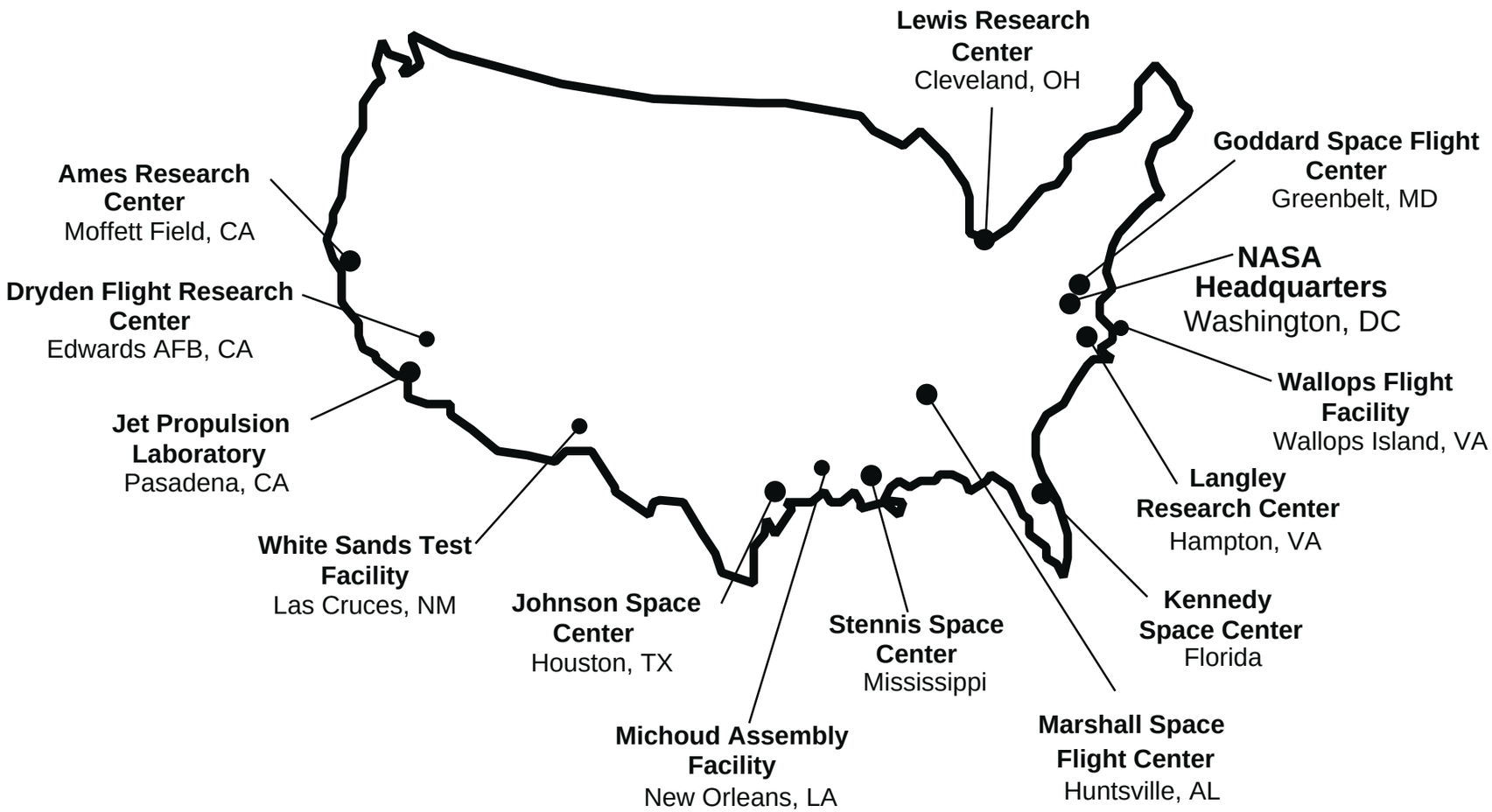
NASA Installations



NASA Installations

NASA HEADQUARTERS
Washington, DC 20546

NASA Headquarters exercises management over the space flight centers, research centers, and other installations that constitute the National Aeronautics and Space Administration.

Responsibilities of Headquarters cover the determination of programs and projects; establishment of management policies; procedures and performance criteria; evaluation of progress; and the review and analysis of all phases of the aerospace program.

Management of NASA's research and development programs is the responsibility of program offices which report to and receive overall guidance and direction from an associate administrator.

AMES RESEARCH CENTER
Moffett Field, CA 94035

Ames Research Center's responsibilities are concentrated in computer science and applications, computational and experimental aerodynamics, flight simulation, flight research, hypersonic aircraft, rotorcraft and powered-lift-technology, aeronautical and space human factors, life sciences, solar systems exploration, airborne science and applications and infrared astronomy.

Ames is home to more than a dozen major wind tunnels, including the world's largest; several advanced flight simulators, a variety of supercomputers, including some of the world's fastest, and several unique aircraft -- both fixed-wing and rotocraft -- used for aeronautical flight research and for flying laboratories. It also includes a variety of unique facilities for life sciences research.

Through its research efforts, the center supports military programs, the Space Shuttle and various civil aviation projects. These projects and responsibilities will continue to evolve as NASA's needs change and Ames' capabilities develop.

HUGH L. DRYDEN FLIGHT RESEARCH CENTER
Edwards, CA 93523

The Dryden Flight Research Center was named after Hugh L. Dryden, an internationally known aeronautical scientist. In 1946, he was appointed NACA's Director of Aeronautical Research, and was responsible for making the center a permanent facility in 1947. His vision was "to separate the real from the imagined problems and to make known the overlooked and the unexpected problems."

Dryden acts as the flight arm of NASA's aeronautics enterprise. Dryden is the "Center of Excellence" for atmospheric flight operations and its primary mission is flight research. Dryden's charter is to research, develop, verify and transfer advanced aeronautics, space, and related technologies.

Dryden's primary research tools are research aircraft. The center operates approximately 20 flight research aircraft consisting of SR-71s, F-15s, F-16s, F-18s and a B-52. Experimental aircraft types vary greatly, ranging from the SR-71s that fly at speeds of Mach 3 to the Pathfinder solar powered Remotely Powered Aircraft(RPA) that flies at 25mph.

The center's ground-based facilities complement Dryden's flight research mission and include a highly-developed aircraft flight instrumentation capability; a data analysis facility for processing of flight research data; flight simulators and a test range communications and data transmission capability that links NASA's Western Aeronautical Test Range facilities.

NASA Installations

Dryden continues to serve as the "back-up" landing site for the Space Shuttle Orbiters as well as processing the vehicles for ferry flights back to the Kennedy Space Center.

GODDARD SPACE FLIGHT CENTER
Greenbelt, MD 20771

This NASA field center, 10 miles northeast of Washington, DC, has one of the worlds leading groups of scientists, engineers and administrative managers. It has the largest scientific staff of all the NASA centers.

With its more than 12,000 civil service and contract employees, including its facility at Wallops Island, VA, the center's work includes research in the Earth and space sciences and the design, fabrication and testing of scientific satellites that survey the Earth and the universe. Goddard also has a leading role in tracking satellites and suborbital space vehicles.

Controllers in the Payload Operations Control Center maintain a 24-hour vigil every day of the year for more than a dozen orbiting spacecraft. Spacecraft being watched include Tracking and Data Relay Satellites which serve as vital communications links between orbiting spacecraft and Earth through a Goddard-managed ground terminal in White Sands, NM. One of those spacecraft is the world renowned Hubble Space Telescope which was launched in 1990. Other more recent payloads which remain under the watchful eyes of Goddard controllers include: Polar, Rossie X-ray Timing Explorer and the Solar and Heliospheric Observatory.

The Compton Gamma Ray Observatory, launched in April 1991, also is managed by Goddard. Compton's mission is to study gamma ray emitting objects in the Milky Way galaxy and beyond. Within its first three months of operation, the Energetic Gamma Ray Experiment Telescope, one of four instruments aboard Compton, detected one of the most luminous gamma-ray sources ever seen. The source of this radiation was identified with the variable Quasar 3C279 located in the constellation Virgo, approximately seven billion light years from Earth.

JET PROPULSION LABORATORY
Pasadena, CA 91109

The laboratory is engaged in exploring the Earth and the solar system with automated spacecraft. In addition to the Pasadena site, JPL manages the Deep Space Communications Complex, a station of the Worldwide Deep Space Network (DSN) located at Goldstone, CA, on 40,000 acres of land occupied under permit from the U.S. Army. The DSN allows for spacecraft communications, data aquisition and mission control, and for the study of space with radio science.

Current NASA flight projects under JPL management include Galileo, Mars Pathfinder and Mars Global Surveyor, New Millennium, Stardust, TOPEX/ Poseidon, Ulysses, Voyager and the planned Cassini mission. Major space science instruments include the second-generation Wide Field and Planetary Camera-2 for the Hubble Space Telescope, the NASA Scattometer and the Spaceborne Imaging Radar. The laboratory designs flight systems, including complete spacecraft and provides technical direction to contractor organizations.

The laboratory conducts research in a variety of fields, including microelectronics, biomedical and communications technologies, information and advanced computer systems.

NASA Installations

LYNDON B. JOHNSON SPACE CENTER
Houston, TX 77058

JSC manages the selection and training of astronauts for Space Shuttle and future Space Station missions. All U.S. human space flights, from launch to landing, are controlled from the Mission Control Center at JSC, a new flight control Center at JSC. A new flight control facility came on line in 1995 and will replace the historic control rooms used since the Gemini program.

JSC manages a fleet of specialized aircraft at Ellington Field, located about seven miles north of the Center, used in training Shuttle pilot astronauts and for microgravity research. JSC also operates the White Sands Missile Range at Las Cruces, NM. WSTF tests Shuttle propulsion systems, powers systems and materials.

JSC is NASA's lead center for life science research, working with medical researchers around the country to study the effects of spaceflight on astronauts and to develop countermeasures that also have applications on Earth. JSC is teaming with researchers from academia and the private sector to form a Biomedical Science Institute, a world class life science research center for human space flight located in the Houston area.

Many of the facilities at JSC contain equipment unique to human space flight programs. Astronauts use the Mockup and Integration Laboratory to become familiar with the Shuttle and Space Station crew environments, to practice emergency procedures, and to rehearse on-orbit tasks. The Manipulator Development Facility employs a hydraulic robotic arm to allow astronauts to practice the precise on-orbit movements required of Shuttle's robotic arm during payload deployment and spacewalks.

Space Shuttle simulators provide realistic training for all phases of flight. The motion base simulator, a duplicate of the Orbiter flight deck, recreates the sights, sounds and feel of launch and entry. The fixed base simulator provides training for on-orbit activities.

The Weightless Environment Training Facility is a large water tank that uses neutral buoyancy to help astronauts practice for spacewalks. This facility will soon be augmented by a much larger Neutral Buoyancy Laboratory which will hold major Space Station components.

JOHN F. KENNEDY SPACE CENTER
Kennedy Space Center, FL 32899

The Kennedy Space Center was established in the early 1960s as the launch site for the Apollo lunar landing missions. KSC pioneered the mobile launch technique in which space vehicles are built up inside protective structures and moved to their launch pads a short time before launch, reducing their exposure to the corrosive sea shore environment to a minimum.

After the Apollo program was concluded in 1972, KSC's Complex 39 was used for the launch of four Skylab missions and for the Apollo spacecraft used in the Apollo-Soyuz Test Project. The center's facilities were modified for the Space Shuttle program during the 1970s. The shuttle era began with the launch of the STS-1 mission on April 12, 1981. Since then, more than 75 Shuttle missions have been launched and the current forecast calls for the launch of approximately seven missions per year from KSC's twin pads.

NASA Installations

KSC is NASA's prime center for the test, checkout and launch of payloads and space vehicles. This includes launch of manned vehicles at KSC and oversight of NASA missions launched on unmanned vehicles from Cape Canaveral Air Station, FL, and Vandenberg Air Force Base (VAFB) in California.

The Center is responsible for the assembly, checkout and launch of Space Shuttle vehicles and their payloads, landing operations and turn-around of Shuttle Orbiters between missions. KSC also is responsible for the operation of the KSC Vandenberg Launch Site Resident Office located at VAFB.

LANGLEY RESEARCH CENTER
Hampton, VA 23665-5225

Langley's primary mission is basic research in aeronautics and space technology. Major research fields include aerodynamics, materials, structures, flight controls, information systems, acoustics, aeroelasticity, atmospheric sciences and non-destructive evaluation.

Approximately 60 percent of Langley's efforts are in aeronautics, working to improve today's aircraft and to develop concepts and technology for future flight. Over 40 wind tunnels, other unique research facilities and testing techniques aid in the investigation of the full range-from general aviation and transport aircraft through hypersonic vehicles.

Langley's goal is to develop technologies to enable aircraft to fly faster, farther, safer and to be more maneuverable, quieter, less expensive to manufacture and more energy efficient.

Researchers are studying improved flight control systems to aid aircraft in operating more efficiently in all kinds of weather and in crowded terminal airways.

Langley is lead center for management of the agency's technology development program for the future High Speed Civil Transport progam. Langley will manage high-speed technology in areas of aerodynamic performance, airframe materials and structures, the flight deck and airframe systems integration. Improvements in supersonic (Mach 1-5) engine performance, fabrication of composite materials and laminar flow airfoil technology are spawning a new era in long-distance air travel. Passengers in the next century will benefit from current research programs at Langley.

LEWIS RESEARCH CENTER
Cleveland, OH 44135

In 1941 the National Advisory Committee for Aeronautics (NACA) established the NASA Lewis Research Center as a flight propulsion laboratory. The Center, which was named for George W. Lewis, NACA's Director of Research from 1924 to 1947, developed an international reputation for its research on jet propulsion systems.

Lewis mission involves aeropropulsion, space power, space communications, electric propulsion and microgravity science, including fluid physics, combustion and materials. In addition, Lewis is a supporting Center for chemical propulsion and expendable launch vehicles.

The Center conducts research for NASA's High-Speed Research Program in the areas of combustor design and enabling propulsion materials; for the Advanced Subsonic Technology Program and is advancing technologies to support advance short take-off and vertical landing aircraft; is managing the Advanced Communications Technology Satellite; and is playing a role in NASA's program to enable more effective access to Earth orbit and geosynchronous orbit.

The Center has been advancing propulsion technology to enable aircraft to fly faster, farther and higher, and has also focused its research on fuel economy, noise abatement, reliability and reduced pollution.

Facilities at Lewis include a Space Experiments Lab, Zero-Gravity Drop Tower, Aero-Acoustic Propulsion Laboratory, an Icing Research Tunnel, four (4) unique wind tunnels, space tanks, chemical rocket thrust stands, and chambers for testing jet engine efficiency.

MARSHALL SPACE FLIGHT CENTER
Marshall Space Flight Center, AL 35812

Marshall is NASA's lead center for space transportation systems development and is the agency's center of excellence for space propulsion. Marshall is also NASA's lead center for microgravity, specializing in materials science and biotechnology research.

Marshall led the development of the main propulsion system for the Space Shuttle and for each flight provides the main engines, the external tank that carries liquid oxygen and liquid hydrogen for those engines, and the solid rocket boosters that, together with the engines, lift the Shuttle into orbit.

Additionally, Marshall is managing development of the super light-weight External Tank, planned to replace the current external tank in 1997. It is being fabricated of aluminum alloys and incorporates an orthogrid design for the panels that together make the tank 8,000 pounds lighter than the current configuration.

Marshall is NASA's host center for the Reusable Launch Vehicle (RLV) technology program, a partnership among NASA, the United States Air Force and private industry to conduct cutting-edge research needed to develop a new generation of single-stage-to-orbit launch vehicles. It includes the X-33 advanced technology demonstrator, the X-34 small technology vehicle, and the Delta Clipper-Experimental Advanced (DC-XA) single-stage rocket.

Marshall is NASA's host center for the Reusable Launch Vehicle (RLV) technology program, a partnership among NASA, the United States Air Force and private industry to conduct cutting-edge research needed to develop a new generation of single-stage-to-orbit launch vehicles. It includes the X-33 advanced technology demonstrator, the X-34 small technology vehicle, and the Delta Clipper-Experimental Advanced (DC-XA) single-stage rocket.

Marshall is a manager of scientific payloads and experiments to be flown aboard the Shuttle. Many of these payloads to be flown in Spacelab, a reusable, modular research facility carried in the Shuttle's cargo bay. The center also operates NASA's Spacelab Mission Operations Control Center, from which all NASA Spacelab missions are controlled.

To prepare astronauts for Spacelab missions, the center also operates a Payload Crew Training Complex. Here, science astronauts train in Shuttle an Spacelab simulators to conduct the research they will perform in space.

A designated NASA center of excellence in space optical systems, Marshall is managing the Advanced X-ray Astrophysics Facility, a major astronomy observatory that will provide scientists with roughly a ten-fold improvements in resolving power over previous X-ray telescopes. The center previously managed development and initial checkout of the Hubble Space Telescope which is now relaying a wealth of new knowledge about the universe from distant galaxies to neighboring planets.

Other work assigned to Marshall includes the International Space Welding Experiment being jointly developed with Ukraine. Scheduled to fly aboard the Space Shuttle, the experiment will test a Ukranian Universal hand Tool electron beam welding system as a potential technology for contingency space repairs.

NASA Installations

MICHOUD ASSEMBLY FACILITY
New Orleans, LA 70189

The primary mission of the Michoud Assembly Facility is the systems engineering, engineering design, manufacture, fabrication, assembly, and related work for the Space Shuttle external tank. Marshall Space Flight Center exercises overall management control of the facility.

JOHN C. STENNIS SPACE CENTER
Stennis Space Center, MS 39529

NASA's John C. Stennis Space Center (SSC), located near the Mississippi Gulf Coast, is NASA's primary center for testing and flight certifying large rocket propulsion systems for the Space Shuttle and future generations of space vehicles. Because of its important role in engine testing for more than three decades, Stennis Space Center has been designated NASA's Center of Excellence for rocket propulsion testing. SSC will be responsible for the Agency's rocket propulsion test programs. The center is a unique test facility and is available to support the national interest in propulsion systems development testing. Additionally, the center has developed into a scientific community actively engages in research and development programs involving space, oceans and Earth.

Since 1975, SSC's primary mission has been the testing of Space Shuttle Main Engines to include research and development testing and flight acceptance testing, Static testing is conducted on the same concrete and steel stands used from 1966 to 1970 to captive-fire all first and second stages of the Saturn V rocket used in the Apollo manned lunar landing and Skylab programs.

Stennis Space Center is working toward testing advances space propulsion hardware for future vehicles. Preparations are under way at Stennis for testing associated with the Reusable Launch Vehicle and Evolved Expendable Launch Vehicle programs. These two new programs are being designed by the aero-space industry, which is working with NASA and the Department of Defense to make space launch more accessible and affordable.

WALLOPS FLIGHT FACILITY
Wallops Island, VA 23337

Wallops Flight Facility, a part of the Goddard Space Flight Center, is one of the oldest launch sites in the world. Established in 1945, the facility covers 6,166 acres, including about 1,100 acres of marshland, in three separate areas of marshland, in three separate areas of Virginia's Eastern Shore.

Wallops manages and implements NASA's sounding rocket program which uses solid-fueled launch vehicles to accomplish approximately 30 scientific, suborbital missions each year. Launches are conducted at Wallops and other ranges worldwide.

Wallops manages and coordinates NASA's Scientific Balloon Program using thin-film, helium-filled balloons to provide approximately 30 scientific missions each year. Launches are conducted at Palestine, TX, Ft. Sumner, NM, and sites throughout the world.

Wallops supports NASA, the Department of Defense and other agencies in aeronautical research. Approximately 150-200 test operations, concentrating on aircraft/airport interface and aircraft operating problems research, are conducted each year at the research airport.