

# Science and Technology

This section presents statistics on scientific, engineering, and technological resources, with emphasis on patterns of research and development (R&D) funding and on scientific, engineering, and technical personnel, education, and employment. Also included are statistics on space program outlays and accomplishments. Principal sources of these data are the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA).

NSF gathers data chiefly through recurring surveys. Current NSF publications containing data on funds for research and development and on scientific and engineering personnel include the *Science Resources Studies Highlights* summaries series; Detailed Statistical Tables; and annual, biennial, triennial, and special reports. Titles or the areas of coverage of these reports include the following: *Science and Engineering Indicators*; *National Patterns of R&D Resources*; *Science and Engineering Personnel—A National Overview*; *Women and Minorities in Science and Engineering*; science and technology data presented in chart and tabular form in a pocket-size publication; *International Science and Technology Data Update*; profiles on human resources and funding in individual fields of science and engineering; *Federal Funds for Research and Development*; *Federal R&D Funding by Budget Function*; *Federal Support to Universities, Colleges, and Selected Nonprofit Institutions*; *Scientific and Engineering Facilities at Universities and Colleges*; *Geographic Distribution of Industrial R&D Expenditures*; *Research and Development in Industry*; R&D funds and graduate enrollment and support in academic science and engineering; characteristics of doctoral scientists and engineers and of recent graduates in the United States; *U.S. Scientists and Engineers*; and scientists, engineers, and technicians in manufacturing, nonmanufacturing, and trade and regulated industries. Statistical surveys in these areas pose problems of concept and definition and the data should, therefore, be regarded as broad estimates

## In Brief

R&D expenditures in constant (1987) dollars:

1970	74.6 bil.
1980	87.6 bil.
1994	137.0 bil.

Nondefense R&D spending as percent of GNP: 1992

Japan	2.8
Unified Germany	2.4
United States	2.1
France	1.9
Italy	1.7
United Kingdom	1.3

rather than precise quantitative statements. See sources for details.

The National Science Board's biennial *Science and Engineering Indicators* contains data and analyses of international and domestic science and technology, including measures of inputs and outputs. *The Budget of the United States Government*, published by the U.S. Office of Management and Budget, contains summary financial data on Federal R&D programs.

## Research and development outlays.

—NSF defines research as a “systematic and intensive study directed toward a fuller knowledge of the subject studied” and development as “the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, methods, or processes.” National coverage of R&D expenditures is developed primarily from periodic surveys in four principal economic sectors: (1) *Government*, made up primarily of Federal executive agencies; (2) *industry*, consisting of manufacturing and nonmanufacturing firms and the federally funded research and development centers (FFRDC's) they administer; (3) *universities and colleges*, composed of universities, colleges, and their affiliated institutions, agricultural experiment stations, and associated schools of agriculture, and FFRDC's administered by educational institutions; and (4) *other nonprofit institutions*, consisting of such

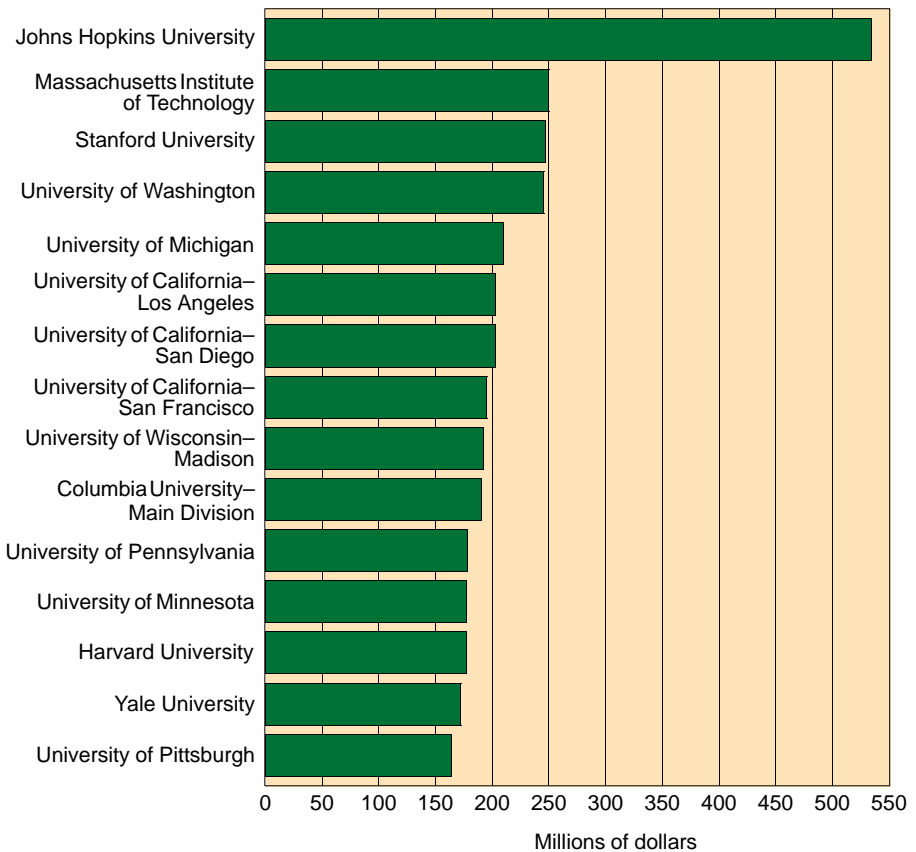
organizations as private philanthropic foundations, nonprofit research institutes, voluntary health agencies, and FFRDC's administered by nonprofit organizations. The R&D funds reported consist of current operating costs, including planning and administration costs, except as otherwise noted. They exclude funds for routine testing, mapping and surveying, collection of general-purpose data, dissemination of scientific information, and training of scientific personnel.

**Scientists, engineers, and technicians.**—Scientists and engineers are defined as persons engaged in scientific and

engineering work at a level requiring a knowledge of sciences equivalent at least to that acquired through completion of a 4-year college course. Technicians are defined as persons engaged in technical work at a level requiring knowledge acquired through a technical institute, junior college, or other type of training less extensive than 4-year college training. Craftsmen and skilled workers are excluded.

**Historical statistics.**—Tabular headnotes provide cross-references, where applicable, to *Historical Statistics of the United States, Colonial Times to 1970*. See Appendix IV.

Figure 20.1  
**Top 15 Universities—Federal Research and Development Obligations: 1992**



Source: Chart prepared by U.S. Bureau of the Census. For data, see table 988.

**No. 979. R&D Expenditures: 1960 to 1994**

[Includes basic research, applied research, and development. Defense-related outlays comprise all research and development spending by Dept. of Defense, including space activities, and a portion of Department of Energy funds. Space-related outlays are those of the National Aeronautics and Space Administration; they exclude space activities of other Federal agencies, estimated at less than 5 percent of all space research and development spending. Minus sign (-) indicates decrease]

YEAR	CURRENT DOLLARS (bil. dol.)			CONSTANT (1987) DOLLARS <sup>1</sup>		ANNUAL PERCENT CHANGE <sup>3</sup>		PERCENT OF TOTAL R&D OUTLAYS				
	Total	Defense space related	Other	Total (bil. dol.)	Percent of GDP <sup>2</sup>	Current dollars	Con- stant dollars	Federally funded defense/space-related			Other outlays	
								Total	Defense	Space	Non- Federal	Federal
1960	13.5	7.5	6.0	52.0	2.6	9.4	7.6	55	52	3	35	9
1965	20.0	10.8	9.3	70.6	2.9	6.3	3.7	54	33	21	35	11
1970	26.1	11.4	14.7	74.6	2.6	2.0	-3.2	44	33	10	43	13
1972	28.5	11.6	16.9	73.7	2.4	6.7	1.9	41	33	8	44	15
1973	30.7	11.9	18.9	74.9	2.3	7.9	1.7	39	32	7	47	15
1974	32.9	11.8	21.1	73.9	2.3	7.0	-1.4	36	29	7	49	15
1975	35.2	12.3	23.0	72.2	2.2	7.2	-2.3	35	27	7	49	17
1976	39.0	13.4	25.6	75.0	2.2	10.8	3.9	34	27	8	49	17
1977	42.8	14.3	28.5	76.7	2.2	9.6	2.2	33	27	7	50	17
1978	48.1	15.3	32.8	80.1	2.2	12.5	4.4	32	26	6	50	18
1979	54.9	16.6	38.4	84.1	2.2	14.2	5.0	30	25	6	51	19
1980	62.6	18.4	44.2	87.6	2.3	13.9	4.3	29	24	5	53	18
1981	71.9	21.2	50.6	91.4	2.4	14.8	4.3	30	24	5	54	17
1982	80.0	24.6	55.4	95.5	2.5	11.3	4.5	31	26	5	54	15
1983	89.1	28.3	60.9	102.3	2.6	11.4	7.1	32	27	4	54	14
1984	101.2	31.8	69.3	111.2	2.7	13.5	8.7	31	28	3	55	14
1985	113.8	37.5	76.3	120.6	2.8	12.5	8.5	33	30	3	54	13
1986	119.6	40.5	79.1	123.3	2.8	5.0	2.3	34	31	3	55	12
1987	125.4	43.2	82.2	125.4	2.8	4.9	1.7	34	31	3	54	12
1988	132.9	43.7	89.2	128.0	2.7	6.0	2.1	33	30	3	55	12
1989	141.0	43.4	97.6	130.0	2.7	6.1	1.6	31	27	4	58	12
1990	151.5	44.4	107.1	134.1	2.7	7.5	3.2	29	25	4	59	11
1991	160.1	42.9	117.2	136.4	2.8	5.6	1.7	27	22	4	62	11
1992	166.7	42.4	124.3	138.1	2.8	4.1	1.3	25	21	4	64	11
1993, prel.	169.5	42.9	126.6	137.4	2.7	1.7	-0.5	25	21	4	64	11
1994, est.	172.6	42.8	129.8	137.0	2.6	1.8	-0.3	25	20	4	64	11

<sup>1</sup> Based on GDP implicit price deflator. <sup>2</sup> GDP = Gross Domestic Product. <sup>3</sup> Change from immediate prior year. Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, annual.

**No. 980. R&D, Source of Funds and Performance Sector: 1970 to 1994**

[In millions of dollars. See headnote, table 981]

YEAR	Total	SOURCE OF FUNDS				PERFORMANCE SECTOR				
		Federal Govt.	Industry	Univ. colleges	Other <sup>1</sup>	Federal Govt.	Industry	Univ. colleges	Associated FFRDC's <sup>2</sup>	Other <sup>1</sup>
Current dollars:										
1970	26,134	14,891	10,444	462	337	4,079	18,067	2,335	737	916
1975	35,213	18,109	15,820	749	535	5,354	24,187	3,409	987	1,276
1980	62,596	29,455	30,912	1,326	903	7,632	44,505	6,063	2,246	2,150
1985	113,818	52,127	57,978	2,369	1,344	12,945	84,239	9,686	3,523	3,425
1987	125,376	57,913	62,643	3,192	1,628	13,413	92,155	12,152	4,206	3,450
1988	132,889	59,546	68,044	3,463	1,836	14,281	97,015	13,462	4,531	3,600
1989	140,981	59,893	75,046	3,921	2,121	15,121	102,055	14,975	4,730	4,100
1990	151,544	61,493	83,380	4,329	2,342	16,002	109,727	16,283	4,832	4,700
1991	160,096	60,219	92,485	4,835	2,557	15,238	116,952	17,577	5,079	5,250
1992	166,697	60,239	98,695	5,018	2,745	15,690	121,314	18,794	5,249	5,650
1993	169,515	61,411	100,124	5,111	2,869	16,556	122,000	19,911	5,298	5,750
1994	172,550	62,200	102,050	5,300	3,000	17,200	123,800	20,500	5,100	5,950
Constant (1987) dollars: <sup>3</sup>										
1970	74,597	42,622	29,673	1,335	966	11,789	51,327	6,749	2,130	2,602
1975	72,237	37,396	32,162	1,574	1,105	11,248	49,161	7,162	2,074	2,593
1980	87,649	41,385	43,118	1,878	1,268	10,810	62,071	8,588	3,181	2,999
1985	120,599	55,245	61,418	2,512	1,425	13,727	89,236	10,271	3,736	3,628
1987	125,376	57,913	62,643	3,192	1,628	13,413	92,155	12,152	4,206	3,450
1988	127,991	57,386	65,492	3,343	1,770	13,785	93,373	12,994	4,374	3,465
1989	130,025	55,275	69,169	3,624	1,958	13,975	94,060	13,840	4,372	3,779
1990	134,135	54,587	73,604	3,865	2,079	14,288	96,846	14,538	4,314	4,148
1991	136,385	51,407	78,652	4,143	2,183	13,057	99,449	15,062	4,352	4,464
1992	138,099	50,002	81,641	4,178	2,278	13,064	100,342	15,649	4,371	4,673
1993	137,397	49,837	81,077	4,155	2,328	13,460	98,785	16,188	4,307	4,656
1994	137,025	49,479	80,934	4,226	2,386	13,716	98,176	16,348	4,067	4,718

<sup>1</sup> Nonprofit institutions. <sup>2</sup> University associated federally-funded R&D centers. <sup>3</sup> Based on gross domestic product implicit price deflator. Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, annual.

## No. 981. R&amp;D Funds, by Performance Sector: 1980 to 1994

[In millions of dollars, except percent. Data primarily on calendar year basis—calendar year data for industry and other nonprofit institutions combined with Federal and university fiscal year data. Data refer, in general, to natural sciences including engineering, and to social sciences in all but industry sector. Excludes capital expenditures data. Expenditures at associated federally funded research and development centers administered by industry and other nonprofit institutions included in totals of respective sectors. See also *Historical Statistics, Colonial Times to 1970*, series W 109-125]

PERFORMANCE SECTOR	1980	1985	1989	1990	1991	1992	1993	1994
<b>Total R&amp;D<sup>1</sup></b>	<b>62,596</b>	<b>113,818</b>	<b>140,981</b>	<b>151,544</b>	<b>160,096</b>	<b>166,697</b>	<b>169,515</b>	<b>172,550</b>
In 1987 dollars <sup>2</sup>	87,649	120,599	130,025	134,135	136,385	138,099	137,397	137,025
Percent Federal as source	47.2	45.8	42.5	40.7	37.7	36.2	36.3	36.1
Percent of gross domestic product	2.3	2.8	2.7	2.7	2.8	2.8	2.7	2.6
Federal Government	7,632	12,945	15,121	16,002	15,238	15,690	16,556	17,200
Industry	44,505	84,239	102,055	109,727	116,952	121,314	122,000	123,800
Federal funds	14,029	27,196	28,554	28,125	26,372	24,660	24,000	24,000
Industry funds	30,476	57,043	73,501	81,602	90,580	96,654	98,000	99,800
Universities and colleges	6,063	9,686	14,975	16,283	17,577	18,794	19,911	20,500
Federal funds	4,098	6,063	8,988	9,634	10,230	11,090	11,957	12,200
Industry funds	236	560	995	1,128	1,205	1,291	1,374	1,450
University and college funds <sup>3</sup>	1,326	2,369	3,921	4,329	4,835	5,018	5,111	5,300
Other nonprofit institutions funds <sup>3</sup>	403	694	1,071	1,192	1,307	1,395	1,469	1,550
Universities and colleges, associated federally funded R&D centers	2,246	3,523	4,730	4,832	5,079	5,249	5,298	5,100
Other nonprofit institutions	2,150	3,425	4,100	4,700	5,250	5,650	5,750	5,950
Federal funds	1,450	2,400	2,500	2,900	3,300	3,550	3,600	3,700
Industry funds	200	375	550	650	700	750	750	800
Other <sup>4</sup>	500	650	1,050	1,150	1,250	1,350	1,400	1,450
<b>Total research, basic and applied</b>	<b>22,045</b>	<b>39,537</b>	<b>53,525</b>	<b>57,144</b>	<b>65,342</b>	<b>68,422</b>	<b>71,060</b>	<b>72,190</b>
In 1987 dollars <sup>2</sup>	27,513	41,046	51,018	53,144	59,813	61,762	63,411	63,744
Percent Federal as source	54.8	50.8	46.5	47.9	45.2	44.4	45.4	45.2
Federal Government	3,666	5,056	5,982	5,953	6,539	6,616	7,360	7,600
Industry	9,775	21,117	27,907	29,913	35,595	36,969	37,600	38,000
Federal funds	2,190	5,836	6,082	7,721	8,141	7,743	7,900	7,900
Industry funds	7,585	15,281	21,825	22,192	27,454	29,226	29,700	30,100
Universities and colleges	5,566	8,973	13,844	14,986	16,079	17,218	18,277	18,860
Federal funds	3,739	5,604	8,276	8,802	9,245	10,053	10,880	11,150
Industry funds	219	521	925	1,049	1,121	1,201	1,278	1,340
University and college funds <sup>3</sup>	1,233	2,203	3,647	4,026	4,497	4,667	4,753	4,930
Other nonprofit institutions funds <sup>3</sup>	375	645	996	1,109	1,216	1,297	1,366	1,440
Universities and colleges, associated federally funded R&D centers	1,553	2,351	2,952	3,052	3,519	3,779	3,903	3,720
Other nonprofit institutions	1,485	2,040	2,840	3,240	3,610	3,840	3,920	4,010
Federal funds	930	1,250	1,600	1,850	2,100	2,200	2,250	2,250
Industry funds	160	300	440	520	560	610	610	660
Other <sup>4</sup>	395	490	800	870	950	1,030	1,060	1,100
<b>Total basic research</b>	<b>8,435</b>	<b>14,210</b>	<b>21,248</b>	<b>22,322</b>	<b>27,985</b>	<b>29,579</b>	<b>30,676</b>	<b>31,150</b>
In 1987 dollars <sup>2</sup>	11,902	15,064	19,620	19,860	23,906	24,563	24,901	24,788
Percent of total R&D	13.5	12.5	15.1	14.7	17.5	17.7	18.1	18.1
Percent Federal as source	70.1	64.7	61.9	61.9	57.9	57.1	58.3	58.3
Federal Government	1,182	1,923	2,371	2,366	2,446	2,397	2,605	2,700
Industry	1,325	2,862	5,216	5,128	9,423	9,794	9,700	9,700
Federal funds	290	489	1,384	1,368	2,953	2,792	2,700	2,700
Industry funds	1,035	2,373	3,832	3,760	6,470	7,002	7,000	7,000
Universities and colleges	4,036	6,555	9,789	10,640	11,601	12,504	13,270	13,700
Federal funds	2,861	4,342	6,192	6,645	7,123	7,713	8,379	8,650
Industry funds	141	342	598	678	734	803	845	850
University and college funds <sup>3</sup>	793	1,447	2,356	2,601	2,947	3,120	3,143	3,250
Other nonprofit institutions funds <sup>3</sup>	241	424	643	716	797	868	903	950
Universities and colleges, associated federally funded R&D centers	1,132	1,765	2,352	2,428	2,595	2,844	2,941	2,900
Other nonprofit institutions	760	1,105	1,520	1,760	1,920	2,040	2,160	2,150
Federal funds	450	675	850	1,000	1,100	1,150	1,250	1,200
Industry funds	95	170	250	300	320	350	350	370
Other <sup>4</sup>	215	260	420	460	500	540	560	580
<b>Total development</b>	<b>40,551</b>	<b>74,281</b>	<b>87,656</b>	<b>94,400</b>	<b>94,754</b>	<b>98,275</b>	<b>98,455</b>	<b>100,360</b>
In 1987 dollars <sup>2</sup>	56,669	78,698	80,635	83,453	80,650	81,353	79,761	79,643
Percent of total R&D	64.8	65.3	62.0	62.3	59.2	59.0	58.1	58.2
Percent Federal as source	42.9	43.1	40.0	36.1	32.4	30.4	29.6	29.5

<sup>1</sup> Basic research, applied research, and development. <sup>2</sup> Based on gross domestic product implicit price deflator. <sup>3</sup> Includes State and local government funds received by these institutions and used for research and development. <sup>4</sup> Includes estimates for independent nonprofit hospitals and voluntary health agencies.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, annual.

**No. 982. Funds for R&D—Performance Sector, by State: 1991**

[In millions of dollars. See headnote, table 981. Data shown here are unrevised]

STATE	Total	Federal government <sup>1</sup>	Industry	Universities and colleges <sup>2</sup>	Other non-profit <sup>3</sup>	STATE	Total	Federal government <sup>1</sup>	Industry	Universities and colleges <sup>2</sup>	Other non-profit <sup>3</sup>
<b>U.S. ...</b>	<b>145,385</b>	<b>15,238</b>	<b>102,246</b>	<b>22,701</b>	<b>5,200</b>	MO	(NA)	71	( <sup>7</sup> )	306	22
AL	1,503	701	521	245	36	MT	(NA)	26	( <sup>6</sup> )	38	1
AK	146	59	18	67	2	NE	211	22	59	124	6
AZ	1,399	132	944	311	11	NV	261	109	83	67	3
AR	198	35	106	55	2	NH	(NA)	88	( <sup>5</sup> )	79	-
CA	28,337	1,885	21,279	4,700	473	NJ	8,768	513	7,810	433	12
CO	(NA)	275	( <sup>7</sup> )	340	106	NM	2,582	393	1,064	1,111	15
CT	1,913	47	1,535	317	15	NY	10,363	174	8,268	1,751	170
DE	(NA)	9	( <sup>5</sup> )	45	3	NC	1,965	151	1,285	502	27
DC	1,737	1,433	40	118	145	ND	(NA)	24	( <sup>1</sup> )	31	1
FL	3,700	658	2,599	438	5	OH	5,975	689	4,726	504	57
GA	1,479	121	868	484	6	OK	604	41	392	153	18
HI	145	45	1 <sup>1</sup>	78	11	OR	600	47	349	179	24
ID	(NA)	37	( <sup>6</sup> )	42	1	PA	7,621	315	6,262	906	138
IL	6,417	68	5,027	1,275	47	RI	485	226	152	88	18
IN	2,347	92	1,988	262	4	SC	595	14	419	151	10
IA	777	27	461	286	3	SD	32	9	5	16	2
KS	(NA)	12	( <sup>1</sup> )	124	5	TN	1,139	124	737	251	28
KY	317	62	154	98	2	TX	6,635	405	4,755	1,218	257
LA	457	43	172	240	2	UT	665	103	356	202	4
ME	(NA)	14	( <sup>8</sup> )	27	16	VT	(NA)	5	( <sup>5</sup> )	47	5
MD	5,864	3,432	1,203	1,078	151	VA	2,771	1,107	1,115	366	182
MA	8,561	278	6,335	1,338	610	WA	3,890	133	3,215	350	193
MI	8,851	92	8,116	601	42	WV	(NA)	76	( <sup>10</sup> )	73	5
MN	2,228	41	1,810	332	46	WI	1,573	32	1,140	388	13
MS	299	157	41	97	4	WY	41	9	2	23	7
						Other <sup>11</sup>	3,835	577	675	349	2,234

- Represents or rounds to zero. NA Not available. <sup>1</sup> Total funds used by Federal government from Federal sources. <sup>2</sup> Distribution by States includes R&D performed in only doctoral degree granting institutions; U.S. total includes R&D performed in all institutions. <sup>3</sup> For other sector, funds distributed by State include only Federal obligations to organizations in the nonprofit sector. Nonprofit R&D performance using non-Federal funds are undistributed. <sup>4</sup> Between \$1,751 and \$2,593 million. <sup>5</sup> Between \$863 and \$995 million. <sup>6</sup> Under \$95 million. <sup>7</sup> Under \$1,963 million. <sup>8</sup> Under \$284 million. <sup>9</sup> Between \$102 and \$120 million. <sup>10</sup> Between \$69 and \$201 million. <sup>11</sup> Includes unknown.

Source: U.S. National Science Foundation, *Science and Engineering Indicators*, 1993.

**No. 983. Federal Obligations for R&D, by Agency: 1975 to 1994**

[In millions of dollars. For fiscal years ending in year shown; see text, section 9. Includes those agencies with obligations of \$1 billion or more in 1994. See *Historical Statistics, Colonial Times to 1970*, series W 142, for total R&D expenditures]

AGENCY	1975	1980	1985	1989	1990	1991	1992	1993	1994, est.
<b>CURRENT DOLLARS</b>									
<b>Obligations, total<sup>1</sup></b>	<b>19,039</b>	<b>29,830</b>	<b>48,360</b>	<b>61,407</b>	<b>63,668</b>	<b>61,295</b>	<b>65,593</b>	<b>71,445</b>	<b>71,244</b>
Dept. of Defense	9,013	13,981	29,792	37,577	37,268	32,135	36,130	38,987	37,523
Dept. of Health and Human Services	2,281	3,780	5,451	7,903	8,406	9,756	8,988	10,344	10,723
National Aeronautics and Space Administration	3,064	3,234	3,327	5,394	6,533	7,280	7,658	8,190	8,637
Dept. of Energy	2,047	4,754	4,966	5,193	5,631	5,983	6,172	6,586	6,582
National Science Foundation	595	882	1,346	1,670	1,690	1,785	1,868	2,073	2,217
Dept. of Agriculture	420	688	943	1,038	1,108	1,237	1,327	1,331	1,368
<b>CONSTANT (1987) DOLLARS<sup>2</sup></b>									
<b>Obligations, total<sup>1</sup></b>	<b>39,998</b>	<b>42,253</b>	<b>51,283</b>	<b>56,753</b>	<b>56,846</b>	<b>52,479</b>	<b>54,525</b>	<b>57,850</b>	<b>56,275</b>
Dept. of Defense	18,935	19,803	31,592	34,729	33,275	27,513	30,033	31,568	29,639
Dept. of Health and Human Services	4,792	5,354	5,780	7,304	7,505	8,353	7,471	8,376	8,470
National Aeronautics and Space Administration	6,437	4,581	3,528	4,985	5,833	6,233	6,366	6,632	6,822
Dept. of Energy	4,300	6,733	5,266	4,799	5,028	5,122	5,131	5,333	5,199
National Science Foundation	1,250	1,249	1,427	1,543	1,509	1,528	1,553	1,679	1,751
Dept. of Agriculture	882	974	1,000	959	989	1,059	1,103	1,078	1,081

<sup>1</sup> Includes other agencies, not shown separately. <sup>2</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Federal Funds for Research and Development*, annual.

### No. 984. Federal Funding for R&D, by Selected Budget Functions: 1970 to 1995

[In millions of dollars. For fiscal years ending in year shown; see text, section 9. Excludes R&D plant. Represents budget authority. Functions shown are those for which \$1 billion or more was authorized for 1993. See *Historical Statistics, Colonial Times to 1970*, series W 126, for total obligations]

FUNCTION	1970	1980	1985	1990	1991	1992	1993	1994, est.	1995, est.
<b>CURRENT DOLLARS</b>									
<b>Total</b> <sup>1</sup>	<b>15,339</b>	<b>29,739</b>	<b>49,887</b>	<b>63,781</b>	<b>65,898</b>	<b>68,398</b>	<b>69,884</b>	<b>68,311</b>	<b>71,361</b>
Eight functions, percent of total	96.6	96.5	98.3	98.0	97.9	98.0	98.1	97.8	97.5
National defense	7,981	14,946	33,698	39,925	39,328	40,083	41,249	38,020	39,496
Health	1,084	3,694	5,418	8,308	9,226	10,055	10,280	10,936	11,417
Space research and technology	3,606	2,738	2,725	5,765	6,511	6,744	6,988	7,212	7,665
Energy	574	3,603	2,389	2,715	2,943	3,099	2,677	2,854	2,943
General science	452	1,233	1,862	2,410	2,635	2,659	2,691	2,717	2,866
Natural resources and environment	340	999	1,059	1,386	1,582	1,688	1,802	1,992	1,998
Transportation	535	887	1,030	1,045	1,231	1,523	1,703	1,892	1,999
Agriculture	238	585	836	950	1,052	1,155	1,152	1,188	1,190
<b>CONSTANT (1987) DOLLARS</b> <sup>2</sup>									
<b>Total</b> <sup>1</sup>	<b>44,332</b>	<b>42,123</b>	<b>52,902</b>	<b>56,947</b>	<b>56,420</b>	<b>56,856</b>	<b>56,586</b>	<b>53,958</b>	<b>54,851</b>
National defense	23,066	21,170	35,735	35,647	33,671	33,319	33,400	30,032	30,358
Health	3,133	5,232	5,745	7,418	7,899	8,358	8,324	8,638	8,776
Space research and technology	10,422	3,878	2,890	5,147	5,574	5,606	5,658	5,697	5,892
Energy	1,659	5,103	2,533	2,424	2,520	2,576	2,168	2,254	2,262
General science	1,306	1,746	1,975	2,152	2,256	2,210	2,179	2,146	2,203
Natural resources and environment	983	1,415	1,123	1,238	1,354	1,403	1,459	1,573	1,536
Transportation	1,546	1,256	1,092	933	1,054	1,266	1,379	1,494	1,537
Agriculture	688	829	887	848	901	960	933	938	915

<sup>1</sup> Includes other functions, not shown separately. <sup>2</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Federal R&D Funding by Budget Function*, annual.

### No. 985. National R&D Expenditures as a Percent of Gross Domestic Product, by Country: 1975 to 1993

YEAR	TOTAL R&D						NONDEFENSE R&D <sup>1</sup>					
	United States	Japan	Unified Germany	France	United Kingdom	Italy	United States	Japan	Unified Germany	France	United Kingdom	Italy
1975	2.22	1.91	2.24	1.79	2.05	0.84	1.61	1.90	2.10	1.44	1.42	0.83
1980	2.31	2.01	2.45	1.82	(NA)	0.75	1.76	2.00	2.33	1.41	(NA)	0.74
1985	2.82	2.58	2.72	2.25	2.27	1.13	1.98	2.56	2.58	1.78	1.68	1.06
1990	2.73	2.89	2.75	2.42	2.19	1.30	2.01	2.87	2.61	1.85	1.81	1.25
1991	2.80	2.87	2.65	2.42	2.13	1.32	2.11	2.84	2.53	1.92	1.73	1.26
1992	2.77	2.80	2.53	2.36	2.12	1.38	2.10	2.77	2.42	1.92	1.71	1.33
1993	2.67	(NA)	(NA)	(NA)	(NA)	1.40	2.02	(NA)	(NA)	(NA)	(NA)	1.35

NA Not available. <sup>1</sup> Estimated.

Source: National Science Foundation, *National Patterns of R&D Resources*, annual; and Organization for Economic Co-operation and Development.

### No. 986. R&D Expenditures in Science and Engineering at Universities and Colleges: 1981 to 1993

[In millions of dollars]

CHARACTERISTIC	1981	1990	1993 <sup>1</sup>	CHARACTERISTIC	1981	1990	1993 <sup>1</sup>
<b>CURRENT DOLLARS</b>				<b>CONSTANT (1987) DOLLARS</b> <sup>2</sup>			
<b>Total</b>	<b>6,846</b>	<b>16,334</b>	<b>19,911</b>	<b>Total</b>	<b>8,799</b>	<b>14,493</b>	<b>16,122</b>
Basic research	4,593	10,680	13,270	Basic research	5,904	9,476	10,745
Applied R&D	2,253	5,654	6,641	Applied R&D	2,896	5,017	5,377
Source of funds:				Source of funds:			
All governments	5,115	10,976	13,516	All governments	6,575	9,739	10,944
Institutions' own funds	1,004	3,033	3,552	Institutions' own funds	1,290	2,691	2,876
Industry	292	1,130	1,374	Industry	375	1,003	1,113
Other	435	1,195	1,469	Other	559	1,060	1,189
Fields:				Fields:			
Physical sciences	765	1,809	2,124	Physical sciences	983	1,605	1,720
Environmental sciences	550	1,080	1,318	Environmental sciences	707	958	1,067
Mathematical sciences	87	221	272	Mathematical sciences	112	196	220
Computer sciences	144	514	597	Computer sciences	185	456	483
Life sciences	3,695	8,748	10,828	Life sciences	4,749	7,762	8,768
Psychology	127	258	349	Psychology	163	229	283
Social sciences	366	706	896	Social sciences	470	626	726
Other sciences	145	335	375	Other sciences	186	297	304
Engineering	967	2,663	3,151	Engineering	1,243	2,363	2,551

<sup>1</sup> Preliminary. <sup>2</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Survey of Scientific and Engineering Expenditures at Universities and Colleges*, annual.

**No. 987. Federal Obligations to Universities and Colleges: 1970 to 1992**

[In millions of dollars, except percent. For fiscal years ending in year shown; see text, section 9. Minus sign (-) indicates decrease]

ITEM	1970	1980	1985	1988	1989	1990	1991	1992
<b>CURRENT DOLLARS</b>								
<b>Federal obligations, total</b> . . . . .	<b>3,237</b>	<b>8,299</b>	<b>10,972</b>	<b>14,066</b>	<b>15,504</b>	<b>15,198</b>	<b>17,552</b>	<b>19,047</b>
Annual percent change <sup>1</sup> . . . . .	-6.5	9.1	9.3	4.7	10.2	-2.0	15.5	8.5
Academic science/engineering obligations . . . . .	2,188	4,791	7,258	9,136	10,075	10,443	11,829	12,730
Percent of total . . . . .	67.6	57.7	66.2	65.0	65.0	68.7	67.4	66.8
Research and development . . . . .	1,447	4,161	6,246	7,719	8,523	9,006	10,027	10,864
Research and development plant . . . . .	45	38	114	203	237	125	152	195
Other science/engineering activities . . . . .	696	593	898	1,214	1,315	1,312	1,650	1,671
Nonscience/engineering activities . . . . .	1,049	3,508	3,714	4,930	5,429	4,755	5,723	6,318
<b>CONSTANT (1987) DOLLARS<sup>2</sup></b>								
<b>Federal obligations, total</b> . . . . .	<b>9,355</b>	<b>11,755</b>	<b>11,635</b>	<b>13,577</b>	<b>14,329</b>	<b>13,570</b>	<b>15,028</b>	<b>15,833</b>
Annual percent change <sup>1</sup> . . . . .	-11.4	0.0	5.4	1.1	5.5	-5.9	10.7	5.4
Academic science/engineering obligations . . . . .	6,324	6,786	7,697	8,819	9,311	9,324	10,128	10,582
Percent of total . . . . .	67.6	57.7	66.2	65.0	65.0	68.7	67.4	66.8
Research and development . . . . .	4,182	5,894	6,624	7,451	7,877	8,041	8,585	9,031
Research and development plant . . . . .	130	54	121	196	219	111	130	162
Other science/engineering activities . . . . .	2,012	840	952	1,172	1,215	1,172	1,413	1,389
Nonscience/engineering activities . . . . .	3,032	4,969	3,938	4,759	5,018	4,245	4,900	5,252

<sup>1</sup> Percent change from immediate prior year. <sup>2</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Survey of Federal Support to Universities, Colleges, and Nonprofit Institutions*, annual.

**No. 988. Federal R&D Obligations to Selected Universities and Colleges: 1981 to 1992**

[For fiscal years ending in year shown; see text, section 9. For the top 40 institutions receiving Federal R&D funds in 1992. Awards to the administrative offices of university systems are excluded from totals for individual institutions because that allocation of funds is unknown, but those awards are included in "total all institutions"]

MAJOR INSTITUTION RANKED BY TOTAL 1992 FEDERAL R&D OBLIGATIONS	OBLIGATIONS (\$1,000)			RANK		
	1981	1985	1992	1981	1985	1992
<b>Total, all institutions<sup>1</sup></b> . . . . .	<b>4,410,931</b>	<b>6,246,181</b>	<b>10,863,940</b>	(X)	(X)	(X)
40 institutions, percent of total . . . . .	59.0	57.5	56.1	(X)	(X)	(X)
Johns Hopkins University . . . . .	363,429	297,374	534,128	1	1	1
Massachusetts Institute of Technology . . . . .	146,035	189,558	249,852	2	2	2
Stanford University . . . . .	106,073	174,961	246,589	3	3	3
University of Washington . . . . .	99,965	146,179	245,428	4	4	4
University of Michigan . . . . .	73,999	108,035	210,000	11	11	5
University of California—Los Angeles . . . . .	94,945	128,211	202,754	5	5	6
University of California—San Diego . . . . .	91,403	103,633	202,477	6	13	7
University of California—San Francisco . . . . .	64,814	98,536	195,156	15	16	8
University of Wisconsin—Madison . . . . .	86,918	124,604	192,414	8	7	9
Columbia University—Main Division . . . . .	83,659	127,331	190,310	9	6	10
University of Pennsylvania . . . . .	76,136	103,119	178,002	10	15	11
University of Minnesota . . . . .	72,001	103,272	177,182	14	14	12
Harvard University . . . . .	87,830	109,414	176,967	7	9	13
Yale University . . . . .	73,526	109,227	172,304	12	10	14
University of Pittsburgh . . . . .	38,512	58,620	164,183	29	28	15
Cornell University . . . . .	72,671	119,966	162,177	13	8	16
University of California—Berkeley . . . . .	64,065	106,710	154,682	16	12	17
Pennsylvania State University . . . . .	47,099	76,726	148,172	21	19	18
University of Colorado . . . . .	46,146	71,424	147,935	22	23	19
University of Southern California . . . . .	49,221	89,706	141,449	20	17	20
Duke University . . . . .	44,287	69,169	139,864	23	26	21
Washington University . . . . .	54,170	71,978	134,336	17	22	22
University of North Carolina at Chapel Hill . . . . .	38,447	63,105	130,144	30	27	23
University of Illinois—Urbana . . . . .	53,583	83,122	111,061	19	18	24
University of Texas at Austin . . . . .	43,756	72,379	110,616	24	21	25
University of Arizona . . . . .	36,308	49,740	106,229	33	37	26
University of Rochester . . . . .	42,983	70,379	103,020	25	25	27
University of Chicago . . . . .	53,992	71,194	98,668	18	24	28
California Institute of Technology . . . . .	32,959	55,083	97,956	40	32	29
New York University . . . . .	40,636	74,577	96,349	28	20	30
University of Florida . . . . .	30,845	47,716	92,533	43	41	31
University of Iowa . . . . .	35,300	55,117	92,133	34	31	32
University of California—Davis . . . . .	31,757	43,156	90,500	42	47	33
Ohio State University . . . . .	42,899	56,065	90,377	26	30	34
Case Western Reserve University . . . . .	33,744	47,994	88,518	38	40	35
Indiana University . . . . .	29,276	39,118	88,348	45	49	36
Baylor College of Medicine . . . . .	35,062	45,837	84,947	35	45	37
Vanderbilt University . . . . .	27,426	39,909	84,390	49	48	38
University of Alabama—Birmingham . . . . .	29,970	44,093	84,055	44	46	39
Boston University . . . . .	27,019	46,152	79,255	51	43	40

X Not applicable. <sup>1</sup> Includes other institutions, not shown separately.

Source: U.S. National Science Foundation, *Federal Support to Universities and Colleges and Nonprofit Institutions*, annual.

### No. 989. Funds for Performance of Industrial R&D, by Source of Funds and Selected Industries: 1970 to 1992

[In millions of dollars. For calendar years. Covers basic research, applied research, and development. See also *Historical Statistics, Colonial Times to 1970*, series W 144-160]

INDUSTRY	1987 SIC <sup>1</sup> code	1970	1975	1980	1985	1990	1992
CURRENT DOLLARS							
<b>Total funds</b> . . . . .	(X)	<b>18,067</b>	<b>24,187</b>	<b>44,505</b>	<b>84,239</b>	<b>104,606</b>	<b>121,314</b>
Chemicals and allied products . . . . .	28	1,773	2,727	4,636	8,540	12,344	16,711
Petroleum refining and extraction . . . . .	13,29	515	693	1,552	(D)	2,129	2,339
Machinery . . . . .	35	1,729	3,196	5,901	12,216	14,696	15,135
Electrical equipment . . . . .	36	4,220	5,105	9,175	14,432	17,723	13,546
Motor vehicles and motor vehicles equipment . . . . .	371	1,591	2,340	4,955	6,984	(D)	(D)
Aircraft and missiles . . . . .	372,376	5,219	5,713	9,198	22,231	25,356	16,119
Professional and scientific instruments . . . . .	38	744	1,173	3,029	5,013	6,194	9,652
All other <sup>2</sup> . . . . .	(X)	2,276	3,240	6,059	(D)	(D)	(D)
<b>Company funds</b> . . . . .	(X)	<b>10,288</b>	<b>15,582</b>	<b>30,476</b>	<b>57,043</b>	<b>73,980</b>	<b>96,654</b>
Chemicals and allied products . . . . .	28	1,593	2,490	4,264	8,310	12,277	16,420
Petroleum refining and extraction . . . . .	13,29	493	(D)	1,401	2,194	2,113	2,330
Machinery . . . . .	35	1,469	2,687	5,254	10,721	13,780	14,073
Electrical equipment . . . . .	36	2,008	2,798	5,431	9,271	12,131	9,689
Motor vehicles and motor vehicles equipment . . . . .	371	1,278	2,022	4,300	6,164	8,548	(D)
Aircraft and missiles . . . . .	372,376	1,213	1,285	2,570	5,649	6,140	6,248
Professional and scientific instruments . . . . .	38	550	1,001	2,456	4,622	6,095	7,426
All other <sup>2</sup> . . . . .	(X)	1,684	(D)	4,800	10,132	12,896	(D)
CONSTANT (1987) DOLLARS <sup>3</sup>							
<b>Total funds</b> . . . . .	(X)	<b>51,327</b>	<b>49,161</b>	<b>62,071</b>	<b>89,236</b>	<b>92,326</b>	<b>100,176</b>
Chemicals and allied products . . . . .	28	5,037	5,543	6,466	9,047	10,895	13,799
Petroleum refining and extraction . . . . .	13,29	1,463	1,409	2,165	(D)	1,879	1,931
Machinery . . . . .	35	4,912	6,496	8,230	12,941	12,970	12,497
Electrical equipment . . . . .	36	11,989	10,376	12,796	15,288	15,642	11,185
Motor vehicles and motor vehicles equipment . . . . .	371	4,520	4,756	6,911	7,398	(D)	(D)
Aircraft and missiles . . . . .	372,376	14,827	11,612	12,828	23,550	22,379	13,310
Professional and scientific instruments . . . . .	38	2,114	2,384	4,225	5,310	5,466	7,970
All other <sup>2</sup> . . . . .	(X)	6,466	6,585	8,450	(D)	(D)	(D)
<b>Company funds</b> . . . . .	(X)	<b>29,227</b>	<b>31,671</b>	<b>42,505</b>	<b>60,427</b>	<b>65,295</b>	<b>79,813</b>
Chemicals and allied products . . . . .	28	4,526	5,061	5,947	8,803	10,835	13,559
Petroleum refining and extraction . . . . .	13,29	1,401	(D)	1,954	2,324	1,865	1,924
Machinery . . . . .	35	4,173	5,461	7,328	11,357	12,162	11,621
Electrical equipment . . . . .	36	5,705	5,687	7,575	9,821	10,707	8,000
Motor vehicles and motor vehicles equipment . . . . .	371	3,631	4,110	5,997	6,530	7,544	(D)
Aircraft and missiles . . . . .	372,376	3,446	2,612	3,584	5,984	5,419	5,159
Professional and scientific instruments . . . . .	38	1,563	2,035	3,425	4,896	5,379	6,132
All other <sup>2</sup> . . . . .	(X)	4,784	(D)	6,695	10,733	11,382	(D)

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.  
<sup>1</sup> Prior to 1992, 1972 Standard Industrial Classification; beginning 1992, 1987 Standard Industrial Classification; see text, section 13. <sup>2</sup> All other manufacturing and nonmanufacturing. <sup>3</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Research and Development in Industry*, annual.

### No. 990. R&D Funds in R&D-Performing Manufacturing Companies, by Industry: 1970 to 1992

INDUSTRY	1987 SIC <sup>1</sup> code	TOTAL R&D FUNDS AS A PERCENT OF NET SALES					COMPANY R&D FUNDS AS A PERCENT OF NET SALES				
		1970	1980	1985	1990	1992	1970	1980	1985	1990	1992
<b>Total</b> <sup>2</sup> . . . . .	(X)	<b>3.7</b>	<b>3.0</b>	<b>4.4</b>	<b>4.7</b>	<b>4.2</b>	<b>2.2</b>	<b>2.1</b>	<b>3.0</b>	<b>3.3</b>	<b>3.3</b>
Food and kindred products <sup>3</sup> . . . . .	20	0.5	0.4	(D)	(D)	0.5	0.5	(D)	0.6	0.5	0.5
Paper and allied products . . . . .	26	0.9	1.0	(D)	0.8	1.1	(D)	1.0	0.8	0.8	1.0
Chemicals and allied products . . . . .	28	3.9	3.6	5.0	5.6	6.0	3.5	3.3	4.9	5.6	5.9
Petroleum refining and extraction . . . . .	13,29	1.0	0.6	(D)	1.0	1.0	0.9	0.5	0.9	1.0	1.0
Rubber products . . . . .	30	2.3	2.2	(D)	(D)	(D)	1.7	(D)	1.8	1.7	2.5
Stone, clay, and glass products . . . . .	32	1.8	1.4	(D)	(D)	(D)	1.7	1.3	2.3	2.4	1.7
Primary metals . . . . .	33	0.8	0.7	(D)	(D)	0.6	0.8	0.5	0.9	1.0	0.6
Fabricated metal products . . . . .	34	1.2	1.4	1.5	1.2	1.6	1.1	1.2	1.4	1.0	1.1
Machinery . . . . .	35	4.0	5.0	7.6	8.9	7.8	3.4	4.5	6.7	8.3	7.3
Electrical equipment . . . . .	36	7.3	6.6	7.6	6.9	5.7	3.4	3.9	4.8	4.7	4.1
Motor vehicles and motor vehicle equipment . . . . .	371	3.5	4.9	3.8	(D)	(D)	2.8	4.2	3.1	3.9	4.0
Aircraft and missiles . . . . .	372,376	16.2	13.7	14.9	14.3	11.8	3.8	3.8	3.9	3.5	4.6
Professional and scientific instruments . . . . .	38	5.7	7.5	8.9	7.8	8.9	4.2	6.1	8.3	7.6	7.2

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.  
<sup>1</sup> Prior to 1992, 1972 Standard Industrial Classification; beginning 1992, 1987 Standard Industrial Classification; see text, section 13. <sup>2</sup> Includes all manufacturing industries. <sup>3</sup> Includes tobacco products (SIC 21) beginning 1985.

Source: U.S. National Science Foundation, *Research and Development in Industry*, annual.



**No. 991. Federal Obligations for Research, by Field of Science: 1980 to 1994**

[In millions of dollars. For fiscal years ending in year shown; see text, section 9. Excludes R&D plant]

FIELD	1980	1985	1988	1989	1990	1991	1992	1993	1994, est.
<b>CURRENT DOLLARS</b>									
<b>Research, total</b> . . . . .	<b>11,597</b>	<b>16,133</b>	<b>18,650</b>	<b>20,766</b>	<b>21,731</b>	<b>23,968</b>	<b>24,491</b>	<b>27,452</b>	<b>28,124</b>
Basic . . . . .	4,674	7,819	9,474	10,602	11,286	12,171	12,490	13,897	14,346
Applied . . . . .	6,923	8,315	9,177	10,164	10,446	11,798	12,001	13,555	13,778
Life sciences . . . . .	4,192	6,363	7,725	8,495	8,830	9,622	9,910	10,950	11,373
Psychology . . . . .	199	327	390	422	449	482	298	354	346
Physical sciences . . . . .	2,001	3,046	3,317	3,705	3,809	4,235	4,439	4,915	4,832
Environmental sciences . . . . .	1,261	1,404	1,607	1,773	2,174	2,150	2,208	2,412	2,542
Mathematics and computer sciences . . . . .	241	575	643	735	841	904	1,160	1,363	1,469
Engineering . . . . .	2,830	3,618	3,956	4,442	4,335	4,945	4,977	5,840	6,005
Social sciences . . . . .	524	460	486	551	630	727	690	704	709
Other sciences, n.e.c. <sup>1</sup> . . . . .	350	342	527	642	664	903	808	913	847
<b>CONSTANT (1987) DOLLARS<sup>2</sup></b>									
<b>Research, total</b> . . . . .	<b>16,427</b>	<b>17,109</b>	<b>18,002</b>	<b>19,192</b>	<b>19,403</b>	<b>20,521</b>	<b>20,358</b>	<b>22,228</b>	<b>22,215</b>
Basic . . . . .	6,621	8,291	9,144	9,799	10,077	10,420	10,382	11,253	11,332
Applied . . . . .	9,806	8,817	8,858	9,394	9,327	10,101	9,976	10,976	10,883
Life sciences . . . . .	5,938	6,747	7,457	7,851	7,884	8,238	8,238	8,866	8,983
Psychology . . . . .	282	347	376	390	401	413	248	287	273
Physical sciences . . . . .	2,834	3,230	3,202	3,424	3,401	3,626	3,690	3,980	3,817
Environmental sciences . . . . .	1,786	1,489	1,551	1,639	1,941	1,841	1,835	1,953	2,008
Mathematics and computer sciences . . . . .	341	610	621	679	751	774	964	1,104	1,160
Engineering . . . . .	4,009	3,836	3,819	4,105	3,871	4,234	4,137	4,729	4,743
Social sciences . . . . .	742	488	469	509	563	622	574	570	560
Other sciences, n.e.c. <sup>1</sup> . . . . .	495	362	508	593	593	773	672	739	669

<sup>1</sup> N.e.c. = Not elsewhere classified. <sup>2</sup> Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Federal Funds for Research and Development*, annual.

**No. 992. R&D Scientists and Engineers—Employment and Cost, by Industry: 1975 to 1992**

[Data are estimates; on average full-time-equivalent (FTE) basis. See *Historical Statistics, Colonial Times to 1970*, series W 167, for total cost per scientist or engineer]

INDUSTRY	1987 SIC <sup>1</sup> code	1975	1980	1985	1987	1988	1989	1990	1991	1992
<b>EMPLOYED SCIENTISTS</b>										
<b>Average FTE of scientists and engineers (1,000)<sup>2,3</sup></b> . . . . .	<b>(X)</b>	<b>363.9</b>	<b>469.2</b>	<b>646.8</b>	<b>702.2</b>	<b>714.4</b>	<b>725.6</b>	<b>717.5</b>	<b>741.7</b>	<b>783.2</b>
Chemicals <sup>4</sup> . . . . .	28	44.8	53.1	73.5	75.5	76.7	78.3	78.9	82.2	87.4
Machinery . . . . .	35	54.3	65.7	85.7	97.1	99.1	106.1	109.8	103.3	99.4
Electrical equipment <sup>5</sup> . . . . .	36	81.5	100.7	115.6	131.5	136.6	139.3	137.9	114.8	91.2
Motor vehicles . . . . .	371	25.7	36.7	31.3	46.9	46.6	47.8	47.6	45.0	44.9
Aircraft and missiles . . . . .	372,376	67.2	90.6	137.5	136.4	139.4	135.4	123.2	105.4	94.0
<b>CONSTANT (1987) DOLLARS<sup>6</sup></b>										
<b>Cost per scientist or engineer (\$1,000)<sup>3,7</sup></b> . . . . .	<b>(X)</b>	<b>135.2</b>	<b>132.3</b>	<b>138.0</b>	<b>131.2</b>	<b>131.9</b>	<b>129.7</b>	<b>128.7</b>	<b>126.3</b>	<b>127.9</b>
Chemicals <sup>4</sup> . . . . .	28	123.8	121.9	123.2	127.6	135.2	135.2	138.1	142.4	158.0
Machinery . . . . .	35	119.7	125.4	151.0	(D)	(D)	127.7	118.3	125.6	125.8
Electrical equipment <sup>5</sup> . . . . .	36	127.5	127.0	132.4	120.6	114.5	112.2	113.4	125.0	122.7
Motor vehicles . . . . .	371	185.2	188.5	236.4	(D)	(D)	(D)	(D)	(D)	183.6
Aircraft and missiles . . . . .	372,376	173.0	141.7	171.3	179.4	179.0	174.7	181.7	150.4	141.7

D Withheld to avoid disclosure. X Not applicable. <sup>1</sup> Prior to 1992, 1972 Standard Industrial Classification; beginning 1992, 1987 Standard Industrial Classification; see text, section 13. <sup>2</sup> The mean number of FTE R&D scientists and engineers employed in January of the year shown and the following January. <sup>3</sup> Includes industries not shown separately. <sup>4</sup> Includes allied products. <sup>5</sup> Includes communication. <sup>6</sup> Based on gross domestic product implicit price deflator. <sup>7</sup> Represents the arithmetic mean of the numbers of R&D scientists and engineers reported in each industry for January in 2 consecutive years divided into total R&D expenditures in each industry.

Source: U.S. National Science Foundation, *Research and Development in Industry*, annual.

**No. 993. Scientists and Engineers Employed in R&D: 1970 to 1991**

[For full-time equivalent employees. Data are estimates. Yearly averages for industry sector only. Excludes those employed by State and local government agencies]

SECTOR	1970	1980	1982	1983	1984	1985	1987	1989	1991
<b>Total<sup>1</sup> (1,000)</b> . . . . .	<b>543.8</b>	<b>651.1</b>	<b>711.8</b>	<b>751.6</b>	<b>797.6</b>	<b>801.9</b>	<b>877.8</b>	<b>924.2</b>	<b>960.5</b>
PERCENT DISTRIBUTION									
Industry (excl. social scientists) . . . . .	69.1	72.1	73.8	74.8	75.6	80.9	80.0	79.3	80.8
Federal Government . . . . .	12.4	9.0	8.4	8.2	7.8	6.5	6.2	6.4	6.1
Other <sup>2</sup> . . . . .	18.5	18.9	17.8	17.0	16.6	12.6	13.8	14.3	13.1

<sup>1</sup> Due to change in methodology, data beginning 1985 are not comparable with data for previous years. <sup>2</sup> Includes professional R&D personnel employed at universities and colleges, other nonprofit institutions, and federally funded R&D centers administered by organizations in these sectors and graduate students engaged in R&D at universities and colleges.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, annual.

**No. 994. Civilian Employment of Scientists, Engineers, and Technicians, by Occupation and Industry: 1992**

[In thousands. Based on sample and subject to sampling error. For details, see source]

OCCUPATION	Total <sup>1</sup>	WAGE AND SALARY WORKERS								Self employed
		Min-ing <sup>2</sup>	Con-struction	Manu-fac-turing	Trans-por-tation <sup>3</sup>	Trade	FIRE <sup>4</sup>	Services	Government	
<b>Scientists and engineers</b> . . . . .	<b>2,673.7</b>	<b>41.6</b>	<b>27.1</b>	<b>913.5</b>	<b>108.4</b>	<b>86.8</b>	<b>99.3</b>	<b>761.1</b>	<b>461.6</b>	<b>163.0</b>
Scientists . . . . .	1,319.8	19.5	1.2	272.8	33.1	30.8	88.0	458.9	271.7	134.0
Physical scientists . . . . .	197.5	14.8	0.1	59.4	3.2	2.5	0.6	65.3	45.2	6.0
Life scientists . . . . .	182.1	0.1	-	27.6	0.9	1.7	(NA)	57.7	72.9	12.0
Mathematical scientists . . . . .	16.3	-	-	1.5	0.7	-	1.6	7.4	5.1	-
Social scientists . . . . .	257.8	0.3	-	-	1.3	-	7.7	99.0	65.1	84.0
Computer systems analysts, engineers and scientists . . . . .	666.2	4.2	1.1	184.4	26.9	26.5	78.1	229.5	83.3	32.0
Engineers <sup>5</sup> . . . . .	1,353.8	22.2	25.9	640.7	75.4	56.0	11.3	302.2	189.9	29.0
Civil engineers . . . . .	172.8	1.1	10.9	8.3	6.2	0.5	0.9	66.2	73.7	5.0
Electrical/electronics . . . . .	369.9	0.9	5.8	167.6	34.5	35.5	1.1	78.7	39.8	6.0
Mechanical engineers . . . . .	227.0	1.7	4.0	136.6	5.1	7.1	1.3	52.3	13.8	5.0
Engineering and science technicians . . . . .	1,253.1	19.2	25.5	449.5	74.0	84.4	5.1	400.3	160.8	26.0
Electrical/electronics technicians . . . . .	322.8	1.6	5.1	128.0	26.0	62.1	1.8	67.3	26.7	4.0
Engineering technicians . . . . .	372.1	5.4	4.5	132.0	26.6	11.4	0.3	94.7	90.4	6.0
Drafters . . . . .	314.2	2.7	15.9	100.1	17.5	6.6	1.1	144.9	11.3	12.0
Science technicians . . . . .	244.1	9.5	-	89.3	3.9	4.3	1.9	93.4	32.4	4.0
Surveyors . . . . .	99.3	2.6	3.3	-	3.3	-	0.6	55.9	23.0	10.0
Computer programmers . . . . .	554.7	3.4	1.3	80.8	24.1	57.0	75.4	246.1	50.1	16.0

- Represents or rounds to zero. <sup>1</sup> NA Not available. <sup>2</sup> Includes agriculture, forestry, and fishing not shown separately. <sup>3</sup> Includes oil and gas extraction. <sup>4</sup> Includes communications and public utilities. <sup>5</sup> Finance, insurance, and real estate. <sup>6</sup> Includes kinds of engineers and technicians not shown separately.

Source: U.S. Bureau of Labor Statistics, *Monthly Labor Review*, November 1993. (Data collected biennially.)

**No. 995. Graduate Science/Engineering Students in Doctorate-Granting Colleges: 1985 to 1992**

[As of fall. Includes outlying areas]

FIELD OF SCIENCE OR ENGINEERING	TOTAL (1,000)			PERCENT—							
				Female			Foreign		Part-time		
	1985	1990	1992	1985	1990	1992	1990	1992	1985	1990	1992
<b>Total, all surveyed fields</b> . . . . .	<b>353.8</b>	<b>394.8</b>	<b>427.8</b>	<b>34.5</b>	<b>37.5</b>	<b>38.6</b>	<b>25.6</b>	<b>25.1</b>	<b>32.2</b>	<b>30.7</b>	<b>29.9</b>
Science/engineering . . . . .	314.8	347.4	374.8	29.4	32.2	33.2	27.9	27.5	30.4	28.5	27.7
Engineering, total . . . . .	89.7	99.1	108.3	11.5	13.6	14.4	36.7	36.3	39.5	35.6	33.7
Sciences, total . . . . .	225.1	248.2	266.5	36.6	39.6	40.8	24.3	23.9	26.8	25.6	25.3
Physical sciences . . . . .	29.4	32.4	33.6	20.5	23.4	24.5	37.1	36.8	11.7	11.2	10.7
Environmental . . . . .	14.3	13.0	14.0	25.4	29.2	31.0	20.1	21.0	23.9	23.6	24.4
Mathematical sciences . . . . .	15.2	17.2	17.9	29.1	30.4	31.2	36.1	33.9	26.9	23.4	22.3
Computer sciences . . . . .	23.4	27.4	29.0	24.9	22.8	21.8	33.2	35.0	48.0	46.6	46.4
Agricultural sciences . . . . .	10.7	10.4	10.9	25.6	29.2	31.5	29.1	27.8	18.2	17.7	18.2
Biological sciences . . . . .	42.1	46.2	50.2	42.4	45.5	46.3	24.2	24.9	16.0	14.6	14.8
Psychology . . . . .	30.4	34.7	37.7	59.7	65.5	67.3	4.6	4.7	30.1	28.4	27.9
Social sciences . . . . .	59.6	66.8	73.2	39.7	42.9	44.1	21.9	20.4	34.1	32.4	31.3
Health fields, total . . . . .	39.0	47.4	53.0	75.5	76.6	76.4	8.6	8.1	46.2	47.1	45.7

Source: U.S. National Science Foundation, *Survey of Graduate Science Engineering Students and Postdoctorates*, annual.

**No. 996. Science and Engineering Degree Recipients in 1991 and 1992: 1993**

[Based on survey and subject to sampling error; see source for details]

DEGREE AND FIELD	Graduates 1991 and 1992 (1,000)	1993 <sup>1</sup> —PERCENT DISTRIBUTION				Median salary <sup>4</sup> (\$1,000)
		In school <sup>2</sup>	Employed		Not employed or FT students	
			In S&E <sup>3</sup>	In other		
<b>Bachelor's recipients . . . . .</b>	<b>639.4</b>	<b>22</b>	<b>22</b>	<b>50</b>	<b>6</b>	<b>24.0</b>
All science fields . . . . .	521.1	24	13	57	6	22.1
Computer and mathematical sciences . . . . .	77.6	11	32	51	5	28.5
Life and related sciences . . . . .	99.7	38	14	43	6	21.0
Physical and related sciences . . . . .	33.8	39	28	29	4	26.0
Social and related sciences . . . . .	310.0	21	6	66	6	21.0
All engineering fields . . . . .	118.4	15	60	20	5	33.8
Aerospace and related engineering . . . . .	7.3	23	35	37	6	29.0
Chemical engineering . . . . .	6.7	16	70	10	4	40.0
Civil and architectural engineering . . . . .	15.6	12	69	15	4	31.0
Electrical, electronics, computer and communications engineering . . . . .	41.8	16	59	18	7	35.0
Industrial engineering . . . . .	7.7	7	59	30	3	33.0
Mechanical engineering . . . . .	25.1	13	65	19	3	35.0
Other engineering . . . . .	14.1	17	53	25	5	33.0
<b>Master's recipients . . . . .</b>	<b>115.6</b>	<b>23</b>	<b>48</b>	<b>24</b>	<b>5</b>	<b>38.1</b>
All science fields . . . . .	74.6	26	37	31	5	33.8
Computer and mathematical sciences . . . . .	24.1	16	48	31	5	40.0
Life and related sciences . . . . .	13.2	28	35	31	6	29.0
Physical and related sciences . . . . .	10.6	38	46	13	4	34.0
Social and related sciences . . . . .	26.7	31	24	39	6	28.0
All engineering fields . . . . .	41.0	17	68	11	4	42.9
Aerospace and related engineering . . . . .	1.9	26	56	16	3	40.0
Chemical engineering . . . . .	1.7	33	56	7	4	44.0
Civil and architectural engineering . . . . .	4.9	15	74	7	5	38.8
Electrical, electronics, computer and communications engineering . . . . .	15.7	15	71	10	4	44.0
Industrial engineering . . . . .	2.6	13	63	20	4	42.5
Mechanical engineering . . . . .	6.4	17	72	6	4	42.0
Other engineering . . . . .	7.9	18	61	18	3	43.0

<sup>1</sup> As of April. <sup>2</sup> Full-time graduate students. <sup>3</sup> In science and engineering. <sup>4</sup> Excludes students and the self-employed.  
Source: National Science Foundation/SRS, *National Survey of Recent College Graduates: 1993*.

**No. 997. Doctorates Conferred, by Recipients' Characteristics: 1980 and 1993**

[In percent, except as indicated]

CHARACTERISTIC	1980, total	1993									
		All fields <sup>1</sup>	Engi- neer- ing	Physical sci- ences <sup>2</sup>	Earth sci- ences	Math- ematics	Com- puter sci- ences	Bio- logi- cal sci- ences <sup>3</sup>	Agri- cul- tural	Social sci- ences <sup>4</sup>	Psy- chol- ogy
<b>Total conferred (number) . . . . .</b>	<b>31,020</b>	<b>39,754</b>	<b>5,696</b>	<b>3,682</b>	<b>790</b>	<b>1,146</b>	<b>878</b>	<b>5,090</b>	<b>969</b>	<b>3,514</b>	<b>3,419</b>
Male . . . . .	69.7	62.0	90.9	78.8	79.2	77.0	84.4	76.5	59.7	62.9	38.9
Female . . . . .	30.3	38.0	9.1	21.2	20.8	23.0	15.6	23.5	40.3	37.1	61.1
Median age <sup>5</sup> . . . . .	32.2	34.1	31.6	30.0	33.4	31.1	32.3	31.4	34.5	34.8	33.8
<b>CITIZENSHIP<sup>6</sup></b>											
<b>Total conferred (number) . . . . .</b>	<b>30,156</b>	<b>38,559</b>	<b>5,474</b>	<b>3,573</b>	<b>756</b>	<b>1,107</b>	<b>857</b>	<b>4,993</b>	<b>954</b>	<b>3,405</b>	<b>3,304</b>
U.S. citizen . . . . .	83.6	68.4	40.6	58.3	62.6	44.8	49.5	69.0	47.9	59.9	92.8
Foreign citizen . . . . .	16.4	31.6	59.4	41.7	37.4	55.2	50.5	31.0	52.1	40.1	7.2
<b>RACE/ETHNICITY<sup>7</sup></b>											
<b>Total conferred (number) . . . . .</b>	<b>26,512</b>	<b>28,636</b>	<b>2,691</b>	<b>1,199</b>	<b>516</b>	<b>590</b>	<b>498</b>	<b>3,747</b>	<b>506</b>	<b>2,215</b>	<b>3,606</b>
White <sup>8</sup> . . . . .	84.7	83.8	75.1	65.2	89.9	80.7	80.3	83.9	86.4	85.0	77.6
Black <sup>8</sup> . . . . .	4.2	4.5	1.9	3.3	1.0	1.4	1.2	2.0	3.2	6.0	3.3
Asian/Pacific <sup>8</sup> . . . . .	4.2	7.0	19.5	21.9	4.5	13.4	15.5	9.8	5.7	3.3	14.6
Indian/Alaskan <sup>8</sup> . . . . .	0.3	0.4	0.1	0.4	0.8	0.2	0.2	0.2	0.2	0.2	0.4
Hispanic . . . . .	1.8	3.4	2.4	6.8	2.5	2.7	1.4	3.0	4.0	4.0	3.6
Other/unknown . . . . .	4.9	0.9	1.0	2.3	1.4	1.7	1.4	1.1	0.6	1.4	0.4

<sup>1</sup> Includes other fields, not shown separately. <sup>2</sup> Astronomy, physics, and chemistry. <sup>3</sup> Biochemistry, botany, microbiology, physiology, zoology, and related fields. <sup>4</sup> Anthropology, sociology, political science, economics, international relations, and related fields. <sup>5</sup> For definition of median, see Guide to Tabular Presentation. <sup>6</sup> For those with known citizenship. Includes those with temporary visas. <sup>7</sup> Excludes those with temporary visas. <sup>8</sup> Non-Hispanic.

Source: U.S. National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, *Selected Data on Science and Engineering Doctorate Awards: 1993*, annual.

**No. 998. Space Vehicle Systems—Net Sales and Backlog Orders: 1965 to 1993**

[In millions of dollars. Backlog orders as of Dec. 31. Based on data from major companies engaged in manufacture of aerospace products. Includes parts but excludes engines and propulsion units]

YEAR	NET SALES			BACKLOG ORDERS			YEAR	NET SALES			BACKLOG ORDERS		
	Total	Military	Non-military	Total	Military	Non-military		Total	Military	Non-military	Total	Military	Non-military
1965	2,449	602	1,847	2,203	503	1,700	1986	6,304	4,579	11,725	8,063	6,028	12,035
1970	1,956	1,025	931	1,184	786	398	1987	8,051	5,248	12,803	12,393	9,460	12,933
1975	2,119	1,096	1,023	1,304	1,019	285	1988	8,622	6,190	12,432	10,838	7,880	12,958
1980	3,483	1,461	2,022	1,814	951	863	1989	9,758	6,457	13,301	13,356	9,192	14,164
1981	3,856	1,736	2,120	3,174	2,164	1,010	1990	9,691	6,556	13,135	12,462	8,130	14,332
1982	4,749	2,606	2,143	4,337	2,403	1,934	1991	10,515	6,770	13,745	11,664	6,221	15,443
1983	4,940	2,420	2,520	4,865	2,733	2,132	1992	9,266	5,887	13,379	12,809	7,622	15,187
1984	5,225	3,019	2,206	4,624	3,099	1,525	1993	9,341	5,534	13,807	13,282	7,129	16,153
1985	6,300	4,241	2,059	6,707	4,941	1,766							

<sup>1</sup> Includes data for nonmilitary missile systems and parts.

Source: U.S. Bureau of the Census, *Current Industrial Reports*, MA-37D, *Aerospace Industry (Orders, Sales, and Backlog)*.

**No. 999. Federal Outlays for General Science, Space, and Other Technology: 1970 to 1995**

[In billions of dollars. For fiscal years ending in year shown; see text, section 9]

YEAR	CURRENT DOLLARS			CONSTANT (1987) DOLLARS		
	Total	General science/basic research	Space and other technologies	Total	General science/basic research	Space and other technologies
1970	4.5	0.9	3.6	13.9	2.9	11.0
1975	4.0	1.0	3.0	8.2	2.1	6.0
1980	5.8	1.4	4.4	8.2	1.9	6.3
1981	6.5	1.5	5.0	8.1	1.8	6.2
1982	7.2	1.6	5.6	8.5	1.9	6.6
1983	7.9	1.6	6.3	8.9	1.8	7.1
1984	8.3	1.8	6.5	9.0	2.0	7.0
1985	8.6	2.0	6.6	9.1	2.1	6.9
1986	9.0	2.2	6.8	9.2	2.3	6.9
1987	9.2	2.2	7.0	9.2	2.2	7.0
1988	10.8	2.4	8.4	10.5	2.3	8.2
1989	12.8	2.6	10.2	11.9	2.4	9.5
1990	14.4	2.8	11.6	12.8	2.5	10.3
1991	16.1	3.1	13.0	13.7	2.7	11.0
1992	16.4	3.5	12.8	13.7	3.0	10.7
1993	17.0	3.9	13.1	13.9	3.2	10.7
1994	16.2	3.8	12.4	12.7	3.0	9.7
1995	16.9	4.1	12.8	13.0	3.2	9.8

Source: U.S. Office of Management and Budget, *Budget of the United States*, annual.

**No. 1000. NASA Financial Summary: 1970 to 1994**

[In millions of dollars. For fiscal year ending in year shown; see text, section 9]

YEAR	TOTAL		R&D		COMMUNICATIONS <sup>1</sup>		FACILITIES CONSTRUCTION		RESEARCH AND PROGRAM DEVELOPMENT	
	Appropriations	Outlays	Appropriations	Outlays	Appropriations	Outlays	Appropriations	Outlays	Appropriations	Outlays
1970	3,749	3,753	3,006	2,992	-	-	53	54	690	707
1975	3,231	3,267	2,331	2,420	-	-	140	85	760	761
1980	5,243	4,852	4,091	3,701	-	-	156	140	996	1,010
1985	7,552	7,318	2,468	2,118	3,602	3,707	150	170	1,332	1,323
1986	7,764	7,404	2,638	2,615	3,689	3,267	133	189	1,303	1,332
1987	10,621	7,592	3,166	2,436	5,561	3,597	469	149	1,425	1,409
1988	9,002	9,092	3,414	2,916	3,908	4,362	178	166	1,501	1,648
1989	10,898	11,051	4,267	3,922	4,464	5,030	305	190	1,862	1,908
1990 <sup>2</sup>	12,296	12,428	5,221	5,094	4,555	5,117	588	218	1,923	1,991
1991 <sup>2</sup>	15,078	13,877	6,024	5,766	6,334	5,590	498	326	2,212	2,185
1992 <sup>2</sup>	14,302	13,818	6,396	6,261	5,124	5,311	525	448	2,242	1,784
1994, est. <sup>2</sup>	14,551	(NA)	7,529	(NA)	4,854	(NA)	518	(NA)	1,636	(NA)

- Represents zero. NA Not available. <sup>1</sup> Space flight, control, and data communications. <sup>2</sup> Include appropriations and outlays for the Inspector General, not shown separately.

Source: U.S. National Aeronautics and Space Administration, *1995 Budget Summary*.

### No. 1001. National Aeronautics and Space Administration—Budget Summary: 1993 to 1995

[In millions of dollars. Data represent budget authority for fiscal years]

ITEM	1993	1994	1995
<b>Total</b> . . . . .	<b>14,322.5</b>	<b>14,551.4</b>	<b>14,300.0</b>
Human space flight . . . . .	6,672.0	6,069.7	5,719.9
Space station . . . . .	2,162.0	1,937.0	1,889.6
Russian cooperation . . . . .	79.5	170.8	150.1
Space shuttle . . . . .	3,988.2	3,549.3	3,324.0
Payload and utilization operations . . . . .	442.3	412.6	356.2
Science, aeronautics and technology . . . . .	4,908.7	5,847.3	5,901.2
Space science . . . . .	1,510.4	1,721.9	1,766.0
Life and microgravity sciences and applications . . . . .	407.5	515.3	470.9
Mission to planet earth . . . . .	936.3	1,024.5	1,238.1
Aeronautical research and technology . . . . .	769.4	1,102.2	898.5
Advanced concepts and technology . . . . .	464.9	495.3	608.4
Launch services . . . . .	180.8	313.5	340.9
Mission communication services . . . . .	546.5	589.1	481.2
Academic programs . . . . .	92.9	85.5	97.2
Mission support . . . . .	2,727.2	2,619.0	2,662.9
Safety, reliability and quality assurance . . . . .	32.7	34.3	38.7
Space communication services . . . . .	333.7	214.4	268.9
Research and program management . . . . .	2,171.4	2,148.2	2,220.3
Construction of facilities . . . . .	189.4	222.1	135.0
Inspector General . . . . .	14.6	15.4	16.0

Source: U.S. National Aeronautics and Space Administration, 1995 Budget Summary.

### No. 1002. U.S. Commercial Space Revenues: 1990 to 1994

[In millions of dollars. For calendar years]

INDUSTRY	1990	1991	1992	1993	1994 <sup>1</sup>
<b>Total</b> . . . . .	<b>3,385</b>	<b>4,370</b>	<b>4,860</b>	<b>5,295</b>	<b>6,490</b>
Commercial satellites delivered . . . . .	1,000	1,300	1,300	1,100	1,400
Satellite services . . . . .	800	1,200	1,500	1,850	2,300
Fixed . . . . .	735	1,115	1,275	1,600	1,950
Mobile . . . . .	65	85	225	250	350
Satellite ground equipment . . . . .	860	1,300	1,400	1,600	1,850
Mobile-equipment . . . . .	145	280	350	420	480
Commercial launches . . . . .	570	380	450	465	580
Remote sensing data and services . . . . .	155	190	210	250	300
Commercial R&D infrastructure . . . . .	-	-	-	30	60

- Represents zero. <sup>1</sup> Forecast.

Source: U.S. Department of Commerce, International Trade Administration, U.S. Industrial Outlook, 1994.

### No. 1003. NASA Space Shuttle Operations Expenditures: 1993 to 1995

[In millions of dollars. Data are funding requirements fiscal years shown]

OPERATION	1993	1994	1995
<b>Total</b> . . . . .	<b>2,857.2</b>	<b>2,570.6</b>	<b>2,420.1</b>
Orbiter . . . . .	477.0	364.1	292.8
System integration . . . . .	200.6	211.2	190.5
External tank . . . . .	300.2	305.3	379.6
Space shuttle main engine . . . . .	239.9	191.8	144.4
Redesigned solid rocket . . . . .	409.4	368.9	373.1
Solid rocket booster . . . . .	172.0	156.4	144.9
Launch and landing operations . . . . .	697.1	650.1	596.4
Mission and crew operations . . . . .	361.0	322.8	298.4

Source: U.S. National Aeronautics and Space Administration, 1995 Budget Summary.

### No. 1004. Space Shuttle Flights—Summary: 1981 to November 1994

FLIGHT NUMBER	Date	Mission/ Orbiter name	Days duration	FLIGHT NUMBER	Date	Mission/ Orbiter name	Days duration
1	4/12/81	Columbia	2	36	2/28/90	Atlantis	5
4	6/27/81	Columbia	7	31	4/24/90	Discovery	6
2	11/12/81	Columbia	2	41	10/6/90	Discovery	4
3	3/22/82	Columbia	8	38	11/15/90	Atlantis	4
5	11/11/82	Columbia	5	35	12/2/90	Columbia	9
6	4/4/83	Challenger	5	39	4/28/91	Discovery	8
7	6/18/83	Challenger	6	37	4/5/91	Atlantis	6
8	8/30/83	Challenger	6	40	6/5/91	Columbia	9
9	11/28/83	Columbia	10	43	8/2/91	Atlantis	9
10	2/3/84	Challenger	8	44	11/24/91	Atlantis	7
11	4/6/84	Challenger	7	42	1/22/92	Discovery	8
12	8/30/84	Discovery	6	45	3/24/92	Atlantis	8
13	10/5/84	Challenger	8	49	5/7/92	Endeavour	8
14	11/8/84	Discovery	8	50	6/25/92	Columbia	13
15	1/24/85	Discovery	3	46	7/31/92	Atlantis	7
16	4/12/85	Discovery	7	47	9/12/92	Endeavour	7
17	4/29/85	Challenger	7	52	10/22/92	Columbia	9
18	6/17/85	Discovery	7	53	12/2/92	Discovery	7
19	7/29/85	Challenger	8	54	1/13/93	Endeavour	6
20	8/27/85	Discovery	7	56	4/8/93	Discovery	9
21	10/3/85	Atlantis	4	55	4/26/93	Columbia	10
22	10/30/85	Challenger	7	57	6/21/93	Endeavour	10
23	11/26/85	Atlantis	7	51	9/12/93	Discovery	10
24	1/12/86	Columbia	6	58	10/18/93	Columbia	14
25	1/28/86	Challenger	-	61	12/2/93	Endeavour	11
26	9/29/88	Discovery	4	60	2/3/94	Discovery	8
27	12/2/88	Atlantis	4	62	3/4/94	Columbia	14
29	3/13/89	Discovery	5	59	4/9/94	Endeavour	11
30	5/4/89	Atlantis	4	65	7/8/94	Columbia	14
28	8/8/89	Columbia	5	64	9/9/94	Discovery	10
34	10/18/89	Atlantis	5	68	9/30/94	Endeavour	11
33	11/22/89	Discovery	5	66	11/3/94	Atlantis	10
32	1/9/90	Columbia	10				

- Represents zero.

Source: U.S. National Aeronautics and Space Administration, *Payload Flight Assignments NASA Mixed Fleets*, January 1992, and "Space Shuttle Flights as of November 1994".

### No. 1005. World-Wide Successful Space Launches: 1957 to 1993

[Criterion of success is attainment of Earth orbit or Earth escape]

COUNTRY	Total	1957- 1964	1965- 1969	1970- 1974	1975- 1979	1980- 1984	1985- 1989	1989	1990	1991	1992	1993
<b>Total</b>	<b>3,569</b>	<b>289</b>	<b>586</b>	<b>555</b>	<b>607</b>	<b>605</b>	<b>550</b>	<b>101</b>	<b>116</b>	<b>88</b>	<b>94</b>	<b>79</b>
Soviet Union/CIS <sup>1</sup>	2,415	82	302	405	461	483	447	74	75	59	54	47
United States	1,001	207	279	139	126	93	61	18	27	18	28	23
Japan	45	-	-	5	10	12	11	2	3	2	1	1
ESA <sup>2</sup>	57	-	-	-	1	8	21	7	5	8	7	7
China	33	-	-	2	6	6	9	-	5	1	3	1
France	10	-	4	3	3	-	-	-	-	-	-	-
India	4	-	-	-	-	3	-	-	-	-	1	-
Israel	2	-	-	-	-	-	1	-	1	-	-	-
Australia	1	-	1	-	-	-	-	-	-	-	-	-
United Kingdom	1	-	-	1	-	-	-	-	-	-	-	-

- Represents zero. <sup>1</sup> Commonwealth of Independent States. <sup>2</sup> European Space Agency.

Source: Library of Congress, Congressional Research Service, Science Policy Research Division, *Space Activities of the United States, CIS, and Other Launching Countries/Organizations 1957-1993*, March 29, 1994.

### No. 1006. Nobel Prize Laureates in Chemistry, Physics, and Physiology/ Medicine—Selected Countries: 1901 to 1993

[Presented by location of award-winning research and by date of award]

COUNTRY	1901-1993				1901- 1930	1931- 1945	1946- 1960	1961- 1975	1976- 1990	1991- 1993
	Total	Physics	Chem- istry	Physiology/ Medicine						
<b>Total</b>	<b>420</b>	<b>144</b>	<b>119</b>	<b>157</b>	<b>93</b>	<b>49</b>	<b>74</b>	<b>92</b>	<b>98</b>	<b>14</b>
United States	170	59	38	73	6	14	38	41	63	8
United Kingdom	69	21	24	24	15	11	14	20	9	-
Germany	59	17	28	14	27	11	4	8	7	2
France	24	10	7	7	13	2	-	5	2	2
Soviet Union	10	7	1	2	2	-	4	3	1	-
Japan	4	3	1	-	-	-	1	2	1	-
Other countries	84	27	20	37	30	11	13	13	15	2

- Represents zero. <sup>1</sup> Between 1946 and 1991, data are for the former West Germany only.

Source: U.S. National Science Foundation, unpublished data.