

# 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

## In Brief

### R&D expenditures:

1990	\$151.7 bil.
1995	\$183.0 bil.
1997	\$205.7 bil.

### Federal outlays for space and technologies in constant 1992 dollars:

1970	12.6 bil.
1980	7.6 bil.
1990	12.6 bil.
1998	10.0 bil.

and definition and the data should, therefore, be regarded as broad estimates rather than precise quantitative statements. See sources for details.

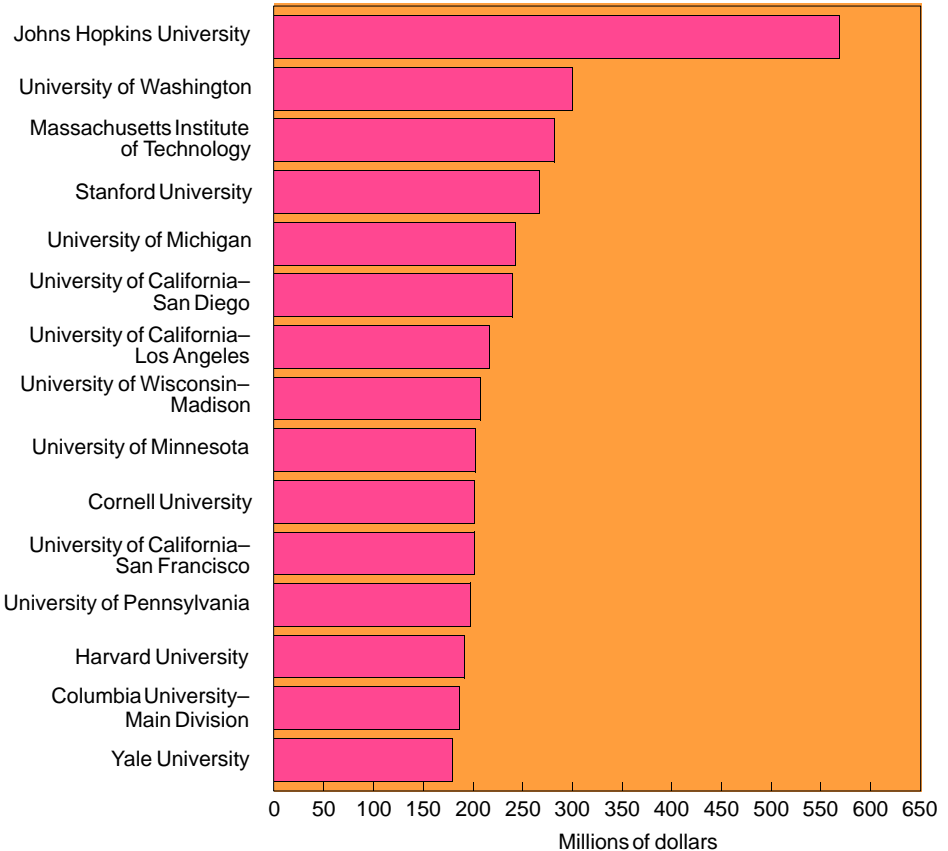
The National Science Board's biennial *Science and Engineering Indicators* contains data and analyses of international and domestic science and technology, including measures of inputs and outputs. *The Budget of the United States Government*, published by the U.S. Office of Management and Budget, contains 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 (FFRDCs) they administer; (3) *universities and colleges*, composed of universities, colleges, and their affiliated institutions, agricultural experiment

stations, and associated schools of agriculture, and FFRDCs administered by educational institutions; and (4) *other nonprofit institutions*, consisting of such organizations as private philanthropic foundations, nonprofit research institutes, voluntary health agencies, and FFRDCs 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.

Figure 20.1  
**Top 15 Universities—Federal Research and Development Obligations: 1995**



Source: Chart prepared by U.S. Bureau of the Census. For data, see Table 996.

**No. 988. R&D Expenditures: 1960 to 1997**

[In millions of dollars, except as indicated. For calendar years]

YEAR	Total	SOURCES OF FUNDS					OBJECTIVE (percent of total)			CHARACTER OF WORK		
		Federal government	Industry	Universities/colleges	Non-profit	Non-federal government	Defense-related <sup>2</sup>	Space-related <sup>3</sup>	Other	Basic research	Applied research	Development
1960	13,669	8,879	4,516	66	122	88	53	3	44	1,256	3,059	9,355
1961	14,514	9,441	4,757	72	146	98	50	6	44	1,476	3,115	9,924
1962	15,577	10,086	5,123	82	177	109	49	7	44	1,780	3,688	10,110
1963	17,446	11,582	5,456	93	195	122	42	14	45	2,060	3,855	11,531
1964	19,053	12,726	5,887	108	198	135	37	19	44	2,358	4,189	12,507
1965	20,192	13,147	6,548	130	221	146	33	21	46	2,618	4,361	13,214
1966	22,010	14,117	7,330	156	249	158	32	20	48	2,886	4,638	14,486
1967	23,279	14,511	8,144	190	267	166	35	14	50	3,113	4,838	15,328
1968	24,646	14,956	9,006	219	286	178	35	14	52	3,361	5,141	16,144
1969	25,965	15,213	10,010	228	311	203	35	11	54	3,471	5,448	17,046
1970	26,235	14,970	10,446	251	340	228	33	10	56	3,567	5,742	16,926
1971	26,910	15,183	10,823	282	364	259	33	10	58	3,698	5,817	17,395
1972	28,661	15,976	11,713	308	389	276	33	8	59	3,829	6,098	18,734
1973	30,905	16,563	13,296	331	417	298	32	7	61	4,051	6,662	20,193
1974	33,238	17,193	14,882	380	470	314	29	7	64	4,439	7,312	21,488
1975	35,565	18,437	15,823	424	542	340	28	7	65	4,827	8,048	22,691
1976	39,314	20,179	17,698	463	608	367	27	8	65	5,291	8,964	25,059
1977	43,233	21,988	19,637	541	683	384	27	7	66	5,925	9,653	27,655
1978	48,582	24,279	22,456	651	768	429	26	6	68	6,841	10,695	31,047
1979	55,269	27,100	26,092	760	841	477	25	6	70	7,736	12,073	35,460
1980	63,076	29,857	30,926	877	911	505	24	5	70	8,651	13,724	40,701
1981	72,190	33,666	35,956	1,031	974	564	24	5	70	9,741	16,389	46,060
1982	80,633	37,113	40,705	1,159	1,037	619	26	5	69	10,658	18,261	51,714
1983	89,742	41,362	45,274	1,329	1,135	642	28	4	68	11,859	20,323	57,560
1984	101,940	46,319	52,225	1,463	1,228	706	29	3	68	13,176	22,481	66,284
1985	114,344	52,493	58,013	1,680	1,365	793	30	3	67	14,510	25,389	74,444
1986	119,907	54,475	61,079	1,944	1,466	942	32	3	65	16,885	27,225	75,796
1987	125,841	58,254	62,669	2,215	1,658	1,044	32	3	65	18,213	27,819	79,809
1988	133,463	59,930	68,076	2,441	1,880	1,135	30	3	66	19,381	29,466	84,614
1989	141,550	60,301	75,091	2,774	2,136	1,248	28	4	68	21,477	32,304	87,767
1990	151,655	61,456	83,374	3,096	2,367	1,361	25	4	70	22,556	34,981	94,118
1991	160,521	60,563	92,484	3,412	2,585	1,478	23	4	73	26,629	38,699	95,193
1992	164,932	60,693	96,404	3,558	2,770	1,508	22	4	74	27,044	37,995	99,894
1993	165,188	60,350	96,704	3,646	2,928	1,561	22	4	74	28,125	37,318	99,746
1994	168,554	60,692	99,332	3,867	3,074	1,588	20	4	76	28,934	36,615	103,005
1995	183,013	63,147	110,998	4,069	3,129	1,670	19	5	77	28,642	40,927	113,445
1996, prel.	193,206	62,810	121,156	4,255	3,250	1,736	18	4	78	29,574	43,353	120,281
1997, prel.	205,742	62,745	133,308	4,457	3,411	1,821	17	4	79	31,212	46,208	128,323

<sup>1</sup> Nonfederal R&D expenditures to university and college performers. <sup>2</sup> R&D spending by the Department of Defense, including space activities, and a portion of the Department of Energy funds. <sup>3</sup> For the National Aeronautics and Space Administration only.

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

**No. 989. Federal Obligations for R&D, by Agency: 1980 to 1997**

[In millions of dollars. For fiscal years ending in year shown; see text, Section 9, State and Local Government. Includes those agencies with obligations of \$1 billion or more in 1997]

AGENCY	1980	1985	1990	1992	1993	1994	1995	1996	1997, prel.
<b>CURRENT DOLLARS</b>									
<b>Obligations, total<sup>1</sup></b>	<b>29,830</b>	<b>48,360</b>	<b>63,559</b>	<b>65,593</b>	<b>67,314</b>	<b>67,256</b>	<b>68,755</b>	<b>69,077</b>	<b>68,064</b>
Dept. of Defense	13,981	29,792	37,268	36,130	35,849	34,566	34,362	34,284	32,064
Dept. of Health and Human Services	3,780	5,451	8,406	8,988	10,349	11,022	11,455	11,914	12,185
National Aeronautics and Space Administration	3,234	3,327	6,533	7,658	8,020	8,296	9,015	9,614	9,204
Dept. of Energy	4,754	4,966	5,631	6,172	6,262	6,048	6,145	5,676	5,895
National Science Foundation	882	1,346	1,690	1,868	1,882	2,040	2,149	2,142	2,279
Dept. of Agriculture	688	943	1,108	1,327	1,328	1,400	1,380	1,352	1,369
<b>CONSTANT (1992) DOLLARS<sup>2</sup></b>									
<b>Obligations, total<sup>1</sup></b>	<b>50,304</b>	<b>61,683</b>	<b>68,196</b>	<b>65,593</b>	<b>65,608</b>	<b>64,053</b>	<b>63,899</b>	<b>62,740</b>	<b>60,287</b>
Dept. of Defense	23,577	37,999	39,987	36,130	34,941	32,920	31,935	31,139	28,400
Dept. of Health and Human Services	6,375	6,953	9,019	8,988	10,087	10,497	10,646	10,821	10,793
National Aeronautics and Space Administration	5,454	4,244	7,010	7,658	7,817	7,901	8,378	8,732	8,152
Dept. of Energy	8,016	6,334	6,042	6,172	6,103	5,760	5,711	5,155	5,221
National Science Foundation	1,487	1,716	1,813	1,868	1,834	1,943	1,997	1,946	2,019
Dept. of Agriculture	1,160	1,203	1,189	1,327	1,294	1,333	1,283	1,228	1,213

<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. 990. Performance Sector of R&D Expenditures: 1992 to 1997

[In millions of dollars. For calendar years]

YEAR	Total	Federal government <sup>1</sup>	INDUSTRY			Industry FFRDCs <sup>1</sup>	UNIVERSITIES AND COLLEGES						Universities & colleges FFRDCs <sup>3</sup>	OTHER NONPROFIT INSTITUTIONS				Nonprofit FFRDCs <sup>1</sup>	
			Total	Funded by—			Total	Funded by—						Total	Funded by—				
				Federal government	Industry <sup>2</sup>			Federal government	Non-federal government	Industry	Universities & colleges	Non-profits			Federal government	Industry	Non-profits		
<b>RESEARCH AND DEVELOPMENT TOTAL</b>																			
1992 . . . . .	164,932	15,853	116,757	22,369	94,388	2,353	19,099	11,306	1,508	1,300	3,558	1,428	5,259	4,864	2,806	716	1,342	748	
1993 . . . . .	165,188	16,532	115,435	20,844	94,591	1,965	20,221	12,129	1,561	1,376	3,646	1,510	5,289	4,997	2,841	737	1,419	749	
1994 . . . . .	168,554	16,440	117,392	20,261	97,131	2,202	21,305	12,826	1,588	1,437	3,867	1,585	5,305	5,152	2,899	764	1,489	759	
1995 . . . . .	183,013	17,231	129,830	21,178	108,652	2,273	22,303	13,434	1,670	1,516	4,069	1,613	5,405	5,167	2,822	830	1,516	804	
1996, prel . . . . .	193,206	16,774	139,579	20,931	118,648	2,273	23,134	13,855	1,736	1,613	4,255	1,676	5,405	5,340	2,871	895	1,575	702	
1997, prel . . . . .	205,742	16,450	151,418	20,787	130,631	2,273	24,031	14,285	1,821	1,710	4,457	1,759	5,405	5,520	2,900	967	1,653	644	
<b>BASIC RESEARCH</b>																			
1992 . . . . .	27,044	2,419	6,528	712	5,816	474	12,710	7,886	933	805	2,202	884	2,867	1,980	1,114	329	537	67	
1993 . . . . .	28,125	2,623	6,427	466	5,961	492	13,497	8,537	957	843	2,235	925	2,953	2,062	1,155	339	567	72	
1994 . . . . .	28,934	2,557	6,514	436	6,078	503	14,267	9,091	970	878	2,361	968	2,944	2,075	1,128	351	596	74	
1995 . . . . .	28,642	2,638	5,569	190	5,379	530	14,945	9,547	1,017	923	2,477	982	2,781	2,104	1,116	382	606	74	
1996, prel . . . . .	29,574	2,477	6,056	182	5,874	530	15,500	9,837	1,059	984	2,597	1,023	2,781	2,155	1,114	412	630	74	
1997, prel . . . . .	31,212	2,687	6,645	178	6,467	530	16,101	10,142	1,113	1,046	2,725	1,075	2,781	2,385	1,279	445	661	83	
<b>APPLIED RESEARCH</b>																			
1992 . . . . .	37,995	4,337	25,660	4,476	21,184	507	4,810	2,375	471	406	1,111	446	940	1,660	933	243	483	81	
1993 . . . . .	37,318	4,838	24,251	4,295	19,956	435	5,068	2,500	495	437	1,157	479	962	1,661	900	251	511	103	
1994 . . . . .	36,615	5,006	22,988	3,616	19,372	503	5,272	2,565	507	459	1,235	506	981	1,753	957	260	536	112	
1995 . . . . .	40,927	5,054	26,919	3,164	23,755	535	5,532	2,687	536	486	1,305	517	979	1,779	951	282	546	129	
1996, prel . . . . .	43,353	5,000	29,065	3,125	25,940	535	5,779	2,814	555	515	1,360	535	979	1,883	1,012	304	567	111	
1997, prel . . . . .	46,208	5,083	31,663	3,102	28,560	535	5,975	2,869	580	545	1,420	560	979	1,863	940	329	595	110	
<b>DEVELOPMENT</b>																			
1992 . . . . .	99,894	9,098	84,569	17,181	67,388	1,373	1,580	1,045	103	89	244	98	1,452	1,223	758	143	322	599	
1993 . . . . .	99,746	9,071	84,757	16,083	68,674	1,039	1,656	1,092	109	96	254	105	1,374	1,275	787	147	340	574	
1994 . . . . .	103,005	8,877	87,890	16,209	71,681	1,196	1,765	1,171	111	101	271	111	1,380	1,324	814	153	357	574	
1995 . . . . .	113,445	9,539	97,342	17,824	79,518	1,209	1,826	1,201	118	107	287	114	1,645	1,284	754	166	364	600	
1996, prel . . . . .	120,281	9,297	104,457	17,624	86,834	1,209	1,855	1,204	122	113	298	118	1,645	1,302	745	179	378	516	
1997, prel . . . . .	128,323	8,681	113,111	17,507	95,604	1,209	1,956	1,274	127	120	312	123	1,645	1,272	682	193	397	451	

<sup>1</sup> For R&D funded by the federal government. FFRDCs are federally funded research and development centers. <sup>2</sup> Includes all nonfederal sources. <sup>3</sup> Includes all R&D expenditures of FFRDCs administered by academic institutions and funded by the federal government. In 1994, 99 percent of total funds used were from federal sources.

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

## No. 991. Performance Sector of R&amp;D Expenditures, by State: 1995

[In millions of dollars. For the fiscal year]

STATE	Total <sup>1</sup>	Federal government <sup>2</sup>	INDUSTRY			UNIVERSITIES AND COLLEGES					Non-profits <sup>6</sup>
			Total	Funded by—		Total	Funded by—				
				Federal government <sup>3</sup>	Industry <sup>4</sup>		Federal government	Industry	Non-profits	Other <sup>5</sup>	
<b>United States . . .</b>	<b>183,013</b>	<b>17,343</b>	<b>132,103</b>	<b>23,451</b>	<b>108,652</b>	<b>22,101</b>	<b>13,331</b>	<b>1,492</b>	<b>1,599</b>	<b>5,679</b>	<b>5,983</b>
Alabama . . . . .	1,681	642	686	273	413	335	190	29	22	94	18
Alaska . . . . .	163	61	30	(D)	(D)	72	37	5	-	30	1
Arizona . . . . .	1,995	178	1,356	620	736	380	210	23	12	134	6
Arkansas . . . . .	330	58	181	(D)	(D)	88	33	8	3	44	3
California . . . . .	36,133	1,844	28,710	6,925	21,785	2,594	1,797	120	198	480	607
Colorado . . . . .	2,603	168	1,865	274	1,591	394	260	24	35	74	51
Connecticut . . . . .	4,311	18	3,906	389	3,517	377	228	20	32	97	10
Delaware . . . . .	1,149	15	1,077	12	1,065	53	27	4	5	17	3
District of Columbia . . . . .	3,128	2,106	672	17	656	181	133	13	15	21	169
Florida . . . . .	5,223	554	4,101	1,634	2,467	559	317	36	29	176	8
Georgia . . . . .	2,113	272	1,175	142	1,031	658	302	55	25	276	8
Hawaii . . . . .	509	402	14	(D)	(D)	78	44	-	3	31	15
Idaho . . . . .	914	28	827	(D)	(D)	59	20	7	2	30	1
Illinois . . . . .	7,487	81	5,776	146	5,630	818	468	43	65	242	41
Indiana . . . . .	3,163	62	2,721	382	2,339	376	197	35	20	123	4
Iowa . . . . .	1,391	37	998	(D)	(D)	323	164	19	15	125	1
Kansas . . . . .	764	12	569	(D)	(D)	181	70	11	8	92	1
Kentucky . . . . .	594	6	452	4	448	135	60	17	5	54	1
Louisiana . . . . .	423	45	61	(D)	(D)	315	136	21	19	138	2
Maine . . . . .	345	4	286	(D)	(D)	32	16	4	1	11	23
Maryland . . . . .	6,519	4,159	1,075	287	788	1,160	895	55	50	160	125
Massachusetts . . . . .	9,969	316	7,416	1,458	5,958	1,147	825	89	128	105	746
Michigan . . . . .	13,275	82	12,388	148	12,240	755	418	51	57	230	50
Minnesota . . . . .	3,087	30	2,636	315	2,321	337	195	23	23	96	85
Mississippi . . . . .	315	133	66	(D)	(D)	113	63	9	6	35	3
Missouri . . . . .	2,499	55	2,028	584	1,443	397	213	37	33	114	18
Montana . . . . .	119	34	17	(D)	(D)	67	27	6	1	33	2
Nebraska . . . . .	336	23	150	(D)	(D)	157	55	11	3	88	6
Nevada . . . . .	445	35	322	(D)	(D)	87	48	7	1	31	1
New Hampshire . . . . .	598	31	472	36	436	93	60	4	12	17	2
New Jersey . . . . .	9,128	344	8,200	197	8,002	443	209	26	33	176	15
New Mexico . . . . .	3,295	481	1,461	1,380	81	230	157	11	7	56	13
New York . . . . .	10,954	117	8,651	1,821	6,831	1,702	1,107	98	195	302	203
North Carolina . . . . .	3,191	220	2,226	15	2,212	687	432	74	21	160	59
North Dakota . . . . .	98	25	12	(D)	(D)	60	28	3	2	27	1
Ohio . . . . .	5,314	599	4,001	574	3,428	643	375	54	59	155	72
Oklahoma . . . . .	529	45	288	38	249	186	60	11	17	99	9
Oregon . . . . .	1,089	56	741	35	706	259	158	12	21	67	33
Pennsylvania . . . . .	6,919	228	5,331	376	4,955	1,140	754	120	66	199	189
Rhode Island . . . . .	896	254	520	(D)	(D)	106	72	2	2	29	17
South Carolina . . . . .	996	34	739	(D)	(D)	220	109	19	19	72	3
South Dakota . . . . .	55	13	19	-	19	21	11	-	1	9	1
Tennessee . . . . .	1,402	62	1,003	(D)	(D)	308	192	16	20	80	20
Texas . . . . .	8,385	538	6,211	912	5,298	1,472	748	102	167	456	164
Utah . . . . .	1,144	131	803	178	625	202	141	9	9	43	8
Vermont . . . . .	308	5	248	(D)	(D)	54	33	5	4	12	1
Virginia . . . . .	3,897	1,581	1,577	743	834	447	262	46	28	111	219
Washington . . . . .	5,241	160	4,294	(D)	(D)	486	340	39	15	91	301
West Virginia . . . . .	475	140	243	(D)	(D)	53	30	3	4	15	6
Wisconsin . . . . .	2,226	40	1,706	33	1,673	473	271	17	51	135	7
Wyoming . . . . .	87	9	25	(D)	(D)	40	15	2	3	20	13
Other/unknown . . . . .	5,805	771	1,772	3,502	8,875	548	320	30	30	167	2,620

- Represents or rounds to zero. D Data withheld to avoid disclosing information about individual companies. <sup>1</sup> Includes university and college Federally Funded Research and Development Centers (FFRDCs), not shown separately. <sup>2</sup> For R&D funded by the federal government. <sup>3</sup> Includes performance at industry FFRDCs. <sup>4</sup> Includes all nonfederal sources. <sup>5</sup> Represents funding by state and local governments and universities and colleges. <sup>6</sup> Data by state are for R&D funded by the federal government. United States total includes other support, not allocated by location.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources, 1997*.

### No. 992. Federal Funding for R&D, by Selected Budget Functions: 1970 to 1998

[In millions of dollars. For fiscal years ending in year shown; see text, Section 9, State and Local Government. Excludes R&D plant. Represents budget authority. Functions shown are those for which \$1 billion or more was authorized for 1998]

FUNCTION	1970	1980	1985	1990	1994	1995	1996	1997, prel.	1998, prel.
<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>68,331</b>	<b>68,791</b>	<b>69,049</b>	<b>70,988</b>	<b>71,602</b>
Eight functions, percent of total	96.6	96.5	98.3	98.0	97.9	97.7	98.0	98.2	98.0
National defense	7,981	14,946	33,698	39,925	37,764	37,204	37,801	39,030	38,726
Health	1,084	3,694	5,418	8,308	10,993	11,407	11,867	12,693	12,998
Space research and technology	3,606	2,738	2,725	5,765	7,414	7,916	7,844	7,795	8,004
Energy	574	3,603	2,389	2,715	2,873	2,844	2,521	2,259	2,229
General science	452	1,233	1,862	2,410	2,712	2,794	2,846	2,962	3,086
Natural resources and environment	340	999	1,059	1,386	2,062	1,988	1,802	1,842	1,902
Transportation	535	887	1,030	1,045	1,888	1,833	1,795	1,827	1,939
Agriculture	238	585	836	950	1,193	1,194	1,176	1,185	1,196
<b>CONSTANT (1992) DOLLARS</b> <sup>2</sup>									
<b>Total</b> <sup>1</sup>	<b>51,113</b>	<b>50,108</b>	<b>63,623</b>	<b>68,448</b>	<b>65,054</b>	<b>63,931</b>	<b>62,728</b>	<b>62,879</b>	<b>61,733</b>
National defense	26,594	25,183	42,977	42,847	35,953	34,575	34,341	34,571	33,388
Health	3,612	6,224	6,910	8,916	10,466	10,601	10,781	11,243	11,206
Space research and technology	12,016	4,613	3,475	6,187	7,059	7,357	7,126	6,904	6,901
Energy	1,913	6,071	3,047	2,925	2,735	2,643	2,290	2,001	1,922
General science	1,506	2,078	2,375	2,586	2,581	2,596	2,586	2,624	2,661
Natural resources and environment	1,133	1,683	1,351	1,487	1,963	1,848	1,637	1,632	1,640
Transportation	1,783	1,495	1,314	1,121	1,798	1,704	1,630	1,618	1,672
Agriculture	793	986	1,066	1,020	1,136	1,109	1,068	1,050	1,031

<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. 993. National R&D Expenditures as a Percent of Gross Domestic Product, by Country: 1981 to 1996

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
1981	2.32	2.13	2.43	1.97	2.37	0.88	1.73	2.12	2.34	1.57	1.84	0.85
1985	2.74	2.58	2.72	2.25	2.23	1.13	1.89	2.56	2.60	1.87	1.76	1.07
1990	2.64	2.85	2.75	2.41	2.18	1.30	1.97	2.83	2.62	1.95	1.84	1.26
1993	2.52	2.68	2.43	2.45	2.15	1.26	1.98	2.65	2.35	2.10	1.85	1.21
1994	2.43	2.64	2.33	2.38	2.11	1.16	1.95	2.60	2.25	2.05	1.84	1.11
1995	2.52	2.78	2.28	2.34	2.05	1.14	2.05	2.74	2.20	(NA)	1.78	1.11
1996	2.55	(NA)	2.26	(NA)	(NA)	1.13	2.10	(NA)	(NA)	(NA)	(NA)	(NA)

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. 994. R&D Expenditures in Science and Engineering at Universities and Colleges: 1981 to 1996

[In millions of dollars]

CHARACTERISTIC	1981	1990	1996	CHARACTERISTIC	1981	1990	1996
<b>CURRENT DOLLARS</b>				<b>CONSTANT (1992) DOLLARS</b> <sup>1</sup>			
<b>Total</b>	<b>6,846</b>	<b>16,285</b>	<b>22,995</b>	<b>Total</b>	<b>10,513</b>	<b>17,483</b>	<b>20,846</b>
Basic research	4,593	10,641	15,467	Basic research	7,053	11,424	14,021
Applied R&D	2,253	5,644	7,529	Applied R&D	3,460	6,059	6,825
Source of funds:				Source of funds:			
All governments	5,115	10,960	15,535	All governments	7,855	11,766	14,083
Institutions' own funds	1,004	3,006	4,232	Institutions' own funds	1,542	3,227	3,836
Industry	292	1,128	1,576	Industry	448	1,211	1,429
Other	435	1,191	1,652	Other	668	1,279	1,498
Fields:				Fields:			
Physical sciences	765	1,807	2,260	Physical sciences	1,175	1,940	2,049
Environmental sciences	550	1,068	1,478	Environmental sciences	845	1,147	1,340
Mathematical sciences	87	222	289	Mathematical sciences	134	238	262
Computer sciences	144	515	702	Computer sciences	221	553	636
Life sciences	3,695	8,726	12,697	Life sciences	5,674	9,368	11,510
Psychology	127	253	372	Psychology	195	272	337
Social sciences	366	703	1,104	Social sciences	562	755	1,001
Other sciences	145	336	419	Other sciences	223	361	380
Engineering	967	2,656	3,675	Engineering	1,485	2,851	3,332

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

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

**No. 995. Federal Obligations to Universities and Colleges: 1970 to 1995**

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

ITEM	1970	1980	1985	1990	1992	1993	1994	1995
<b>CURRENT DOLLARS</b>								
<b>Federal obligations, total</b> . . . . .	<b>3,237</b>	<b>8,299</b>	<b>10,972</b>	<b>15,200</b>	<b>19,066</b>	(NA)	(NA)	(NA)
Annual percent change <sup>1</sup> . . . . .	-6.5	9.1	9.3	-2.0	8.6	(NA)	(NA)	(NA)
Academic science/engineering obligations . . . . .	2,188	4,791	7,258	10,445	12,750	12,751	13,775	14,346
Percent of total . . . . .	67.6	57.7	66.2	68.7	66.9	(NA)	(NA)	(NA)
Research and development . . . . .	1,447	4,161	6,246	9,008	10,846	10,943	11,806	12,068
Research and development plant . . . . .	45	38	114	125	205	259	214	335
Other science/engineering activities . . . . .	696	593	898	1,312	1,699	1,548	1,754	1,942
Nonscience/engineering activities . . . . .	1,049	3,508	3,714	4,755	6,317	(NA)	(NA)	(NA)
<b>CONSTANT (1992) DOLLARS <sup>2</sup></b>								
<b>Federal obligations, total</b> . . . . .	<b>10,814</b>	<b>13,999</b>	<b>14,000</b>	<b>16,318</b>	<b>19,066</b>	(NA)	(NA)	(NA)
Annual percent change <sup>1</sup> . . . . .	-11.2	0.2	5.6	-5.9	5.5	(NA)	(NA)	(NA)
Academic science/engineering obligations . . . . .	7,309	8,082	9,261	11,214	12,749	12,423	13,104	13,306
Percent of total . . . . .	67.6	57.7	66.2	68.7	66.9	(NA)	(NA)	(NA)
Research and development . . . . .	4,833	7,018	7,970	9,671	10,845	10,662	11,231	11,193
Research and development plant . . . . .	150	64	145	134	205	253	204	311
Other science/engineering activities . . . . .	2,326	1,000	1,146	1,409	1,699	1,508	1,669	1,802
Nonscience/engineering activities . . . . .	3,505	5,917	4,739	5,104	6,317	(NA)	(NA)	(NA)

NA Not available. <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 S&E Support to Universities, Colleges, and Nonprofit Institutions*, annual.

**No. 996. Federal R&D Obligations to Selected Universities and Colleges: 1981 to 1995**

[For fiscal years ending in year shown; see text, Section 9, State and Local Government. For the top 45 institutions receiving Federal R&D funds in 1995. 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 1995 FEDERAL R&D OBLIGATIONS	OBLIGATIONS (\$1,000)			RANK		
	1981	1985	1995	1981	1985	1995
<b>Total, all institutions <sup>1</sup></b> . . . . .	<b>4,410,931</b>	<b>6,246,181</b>	<b>12,068,492</b>	(X)	(X)	(X)
45 institutions, percent of total . . . . .	62.1	60.8	59.3	(X)	(X)	(X)
Johns Hopkins University . . . . .	363,429	297,374	569,329	1	1	1
University of Washington . . . . .	99,965	146,179	299,631	4	4	2
Massachusetts Institute of Technology . . . . .	146,035	189,558	282,120	2	2	3
Stanford University . . . . .	106,073	174,961	266,744	3	3	4
University of Michigan . . . . .	73,999	108,035	243,126	11	11	5
University of California—San Diego . . . . .	91,403	103,633	239,078	6	13	6
University of California—Los Angeles . . . . .	94,945	128,211	216,423	5	5	7
University of Wisconsin—Madison . . . . .	86,918	124,604	207,504	8	7	8
University of Minnesota . . . . .	72,001	103,272	202,354	14	14	9
Cornell University . . . . .	72,671	119,966	202,077	13	8	10
University of California—San Francisco . . . . .	64,814	98,536	201,770	15	16	11
University of Pennsylvania . . . . .	76,136	103,119	197,229	10	15	12
Harvard University . . . . .	87,830	109,414	191,499	7	9	13
Columbia University—Main Division . . . . .	83,659	127,331	186,179	9	6	14
Yale University . . . . .	73,526	109,227	179,542	12	10	15
University of Pittsburgh . . . . .	38,512	58,620	171,303	29	28	16
Washington University . . . . .	54,170	71,978	165,373	17	22	18
University of Colorado . . . . .	46,146	71,424	165,373	22	23	17
University of North Carolina at Chapel Hill . . . . .	38,447	63,105	156,609	30	27	19
Duke University . . . . .	44,287	69,169	154,998	23	26	20
Pennsylvania State University . . . . .	47,099	76,726	152,382	21	19	21
University Southern California . . . . .	49,221	89,706	152,179	20	17	22
University of California—Berkeley . . . . .	64,065	106,710	142,338	16	12	23
University of Arizona . . . . .	36,308	49,740	137,014	33	37	24
Case Western Reserve University . . . . .	33,744	47,994	127,750	38	40	25
University of Alabama—Birmingham . . . . .	29,970	44,093	120,191	44	46	26
University of Texas at Austin . . . . .	43,756	72,379	115,882	24	21	27
University of Illinois—Urbana Champaign . . . . .	53,583	83,122	115,717	19	18	28
California Institute of Technology . . . . .	32,959	55,083	113,684	40	32	29
University of Rochester . . . . .	42,983	70,379	107,604	25	25	30
University of Chicago . . . . .	53,992	71,194	106,723	18	24	31
Northwestern University . . . . .	32,446	48,260	102,561	47	39	32
University of California—Davis . . . . .	31,757	43,156	98,932	42	47	33
Ohio State University . . . . .	42,899	56,065	96,429	26	30	34
Vanderbilt University . . . . .	27,426	39,909	94,421	49	48	35
University of Iowa . . . . .	35,300	55,117	93,867	34	31	36
University of Utah . . . . .	38,163	50,938	93,783	31	36	37
University of Maryland—College Park . . . . .	27,313	51,073	92,701	50	35	38
Indiana University . . . . .	29,276	39,118	89,030	45	49	39
Georgetown University . . . . .	10,327	18,194	88,469	103	91	40
Boston University . . . . .	27,019	46,152	86,090	51	43	41
New York University . . . . .	40,636	74,577	85,543	28	40	42
Baylor College of Medicine . . . . .	35,062	45,837	84,076	35	45	43
University of Florida . . . . .	30,845	47,716	83,702	43	41	44
University of Miami . . . . .	28,956	33,709	80,703	46	59	45

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

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



### No. 997. Funds for Performance of Industrial R&D, by Source of Funds and Selected Industries: 1980 to 1995

[In millions of dollars. For calendar years. Covers basic research, applied research, and development]

INDUSTRY	1987 SIC <sup>1</sup> code	1980	1985	1990	1993	1994	1995
<b>CURRENT DOLLARS</b>							
<b>Total funds</b> . . . . .	(X)	<b>44,505</b>	<b>84,239</b>	<b>109,727</b>	<b>117,400</b>	<b>119,595</b>	<b>132,103</b>
Chemicals and allied products . . . . .	28	4,636	8,540	13,291	(D)	(D)	17,547
Petroleum refining and extraction . . . . .	13,29	1,552	(D)	2,306	2,152	1,950	1,760
Machinery . . . . .	35	5,901	12,216	14,446	8,381	8,110	(D)
Electrical equipment . . . . .	36	9,175	14,432	13,400	13,349	15,338	18,751
Motor vehicles and motor vehicles equipment . . . . .	371	4,955	6,984	(D)	11,718	(D)	(D)
Aircraft and missiles . . . . .	372,376	9,198	22,231	20,635	15,056	14,260	16,951
Professional and scientific instruments . . . . .	38	3,029	5,013	7,055	10,119	11,441	11,976
All other <sup>2</sup> . . . . .	(X)	6,059	(D)	(D)	(D)	(D)	(D)
<b>Company funds</b> . . . . .	(X)	<b>30,476</b>	<b>57,043</b>	<b>81,602</b>	<b>94,591</b>	<b>97,131</b>	<b>108,652</b>
Chemicals and allied products . . . . .	28	4,264	8,310	13,168	16,658	16,559	17,337
Petroleum refining and extraction . . . . .	13,29	1,401	2,194	2,289	2,138	1,939	1,754
Machinery . . . . .	35	5,254	10,721	13,575	8,295	8,011	9,676
Electrical equipment . . . . .	36	5,431	9,271	9,267	11,682	13,537	17,060
Motor vehicles and motor vehicles equipment . . . . .	371	4,300	6,164	8,594	10,659	11,950	13,590
Aircraft and missiles . . . . .	372,376	2,570	5,649	5,387	5,684	5,466	5,489
Professional and scientific instruments . . . . .	38	2,456	4,622	6,318	7,542	8,058	8,516
All other <sup>2</sup> . . . . .	(X)	4,800	10,112	23,004	31,933	31,611	35,230
<b>CONSTANT (1992) DOLLARS<sup>3</sup></b>							
<b>Total funds</b> . . . . .	(X)	<b>73,769</b>	<b>107,270</b>	<b>117,230</b>	<b>114,380</b>	<b>113,802</b>	<b>122,590</b>
Chemicals and allied products . . . . .	28	7,684	10,875	14,200	(D)	(D)	16,283
Petroleum refining and extraction . . . . .	13,29	2,573	(D)	2,464	2,097	1,856	1,633
Machinery . . . . .	35	9,781	15,556	15,434	8,165	7,717	(D)
Electrical equipment . . . . .	36	15,208	18,378	14,316	13,006	14,595	17,401
Motor vehicles and motor vehicles equipment . . . . .	371	8,213	8,893	(D)	11,417	(D)	(D)
Aircraft and missiles . . . . .	372,376	15,246	28,309	22,046	14,669	13,569	15,730
Professional and scientific instruments . . . . .	38	5,021	6,384	7,537	9,859	10,887	11,114
All other <sup>2</sup> . . . . .	(X)	10,043	(D)	(D)	(D)	(D)	(D)
<b>Company funds</b> . . . . .	(X)	<b>50,515</b>	<b>72,638</b>	<b>87,182</b>	<b>92,158</b>	<b>92,426</b>	<b>100,828</b>
Chemicals and allied products . . . . .	28	7,068	10,582	14,068	16,230	15,757	16,089
Petroleum refining and extraction . . . . .	13,29	2,322	2,794	2,446	2,083	1,845	1,628
Machinery . . . . .	35	8,709	13,652	14,503	8,082	7,623	8,979
Electrical equipment . . . . .	36	9,002	11,806	9,901	11,382	12,881	15,831
Motor vehicles and motor vehicles equipment . . . . .	371	7,127	7,849	9,182	10,385	11,371	12,611
Aircraft and missiles . . . . .	372,376	4,260	7,193	5,755	5,538	5,201	5,094
Professional and scientific instruments . . . . .	38	4,071	5,886	6,750	7,348	7,668	7,903
All other <sup>2</sup> . . . . .	(X)	7,956	12,877	24,577	31,112	30,080	32,693

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.  
<sup>1</sup> Prior to 1993, 1972 Standard Industrial Classification; beginning 1993, 1987 Standard Industrial Classification; see text, Section 13, Labor Force. <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. 998. R&D Funds in R&D-Performing Manufacturing Companies, by Industry: 1980 to 1995

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				
		1980	1985	1990	1994	1995	1980	1985	1990	1994	1995
<b>Total</b> <sup>2</sup> . . . . .	(X)	<b>3.0</b>	<b>4.4</b>	<b>4.2</b>	<b>3.6</b>	<b>3.6</b>	<b>2.1</b>	<b>3.0</b>	<b>3.1</b>	<b>2.9</b>	<b>2.9</b>
Food and kindred products <sup>3</sup> . . . . .	20	0.4	(D)	(D)	0.5	0.5	(D)	0.6	0.5	0.5	0.5
Paper and allied products . . . . .	26	1.0	(D)	1.0	(D)	(D)	1.0	0.8	1.0	1.0	1.0
Chemicals and allied products . . . . .	28	3.6	5.0	5.3	(D)	4.7	3.3	4.9	5.3	5.1	4.7
Petroleum refining and extraction . . . . .	13,29	0.6	(D)	0.9	0.8	0.7	0.5	0.9	0.9	0.8	0.7
Rubber products . . . . .	30	2.2	(D)	(D)	(D)	(D)	1.8	2.1	2.3	1.6	1.6
Stone, clay, and glass products . . . . .	32	1.4	(D)	(D)	1.7	1.5	1.3	2.3	1.7	1.5	1.5
Primary metals . . . . .	33	0.7	(D)	0.8	0.6	0.5	0.5	0.9	0.8	0.6	0.5
Fabricated metal products . . . . .	34	1.4	1.5	1.4	1.2	1.1	1.2	1.4	1.1	1.0	1.1
Machinery . . . . .	35	5.0	7.6	7.7	3.8	(D)	4.5	6.7	7.2	3.8	3.6
Electrical equipment . . . . .	36	6.6	7.6	6.5	5.9	6.0	3.9	4.8	4.5	5.2	5.4
Motor vehicles and motor vehicle equipment . . . . .	371	4.9	3.8	(D)	(D)	(D)	4.2	3.1	3.7	3.4	3.6
Aircraft and missiles . . . . .	372,376	13.7	14.9	11.8	13.8	12.9	3.8	3.9	3.1	5.3	4.2
Professional and scientific instruments . . . . .	38	7.5	8.9	8.0	9.2	10.3	6.1	8.3	7.1	6.5	7.3

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.  
<sup>1</sup> Prior to 1994, 1972 Standard Industrial Classification; beginning 1994, 1987 Standard Industrial Classification; see text, Section 13, Labor Force. <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. 999. Federal Obligations for Research, by Field of Science: 1980 to 1997**

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

FIELD	1980	1985	1990	1992	1993	1994	1995	1996	1997
<b>CURRENT DOLLARS</b>									
<b>Research, total</b> . . . . .	<b>11,597</b>	<b>16,133</b>	<b>21,731</b>	<b>24,491</b>	<b>26,890</b>	<b>27,440</b>	<b>28,573</b>	<b>28,578</b>	<b>29,174</b>
Basic . . . . .	4,674	7,819	11,286	12,490	13,399	13,553	13,895	14,482	14,732
Applied . . . . .	6,923	8,315	10,446	12,001	13,491	13,887	14,678	14,096	14,441
Life sciences . . . . .	4,192	6,363	8,830	9,910	10,772	11,079	11,869	12,150	12,300
Psychology . . . . .	199	327	449	298	551	550	621	641	650
Physical sciences . . . . .	2,001	3,046	3,809	4,439	4,427	6,793	4,282	4,322	4,398
Environmental sciences . . . . .	1,261	1,404	2,174	2,208	2,608	2,032	2,947	2,924	2,955
Mathematics and computer sciences . . . . .	241	575	841	1,160	1,225	1,242	1,531	1,508	1,546
Engineering . . . . .	2,830	3,618	4,335	4,977	5,499	4,023	5,740	5,509	5,708
Social sciences . . . . .	524	460	630	690	675	655	682	669	728
Other sciences, n.e.c. <sup>1</sup> . . . . .	350	342	664	808	1,133	1,066	902	854	889
<b>CONSTANT (1992) DOLLARS <sup>2</sup></b>									
<b>Research, total</b> . . . . .	<b>19,557</b>	<b>20,578</b>	<b>23,317</b>	<b>24,491</b>	<b>26,209</b>	<b>26,133</b>	<b>26,555</b>	<b>25,956</b>	<b>25,840</b>
Basic . . . . .	7,882	9,973	12,109	12,490	13,059	12,908	12,914	13,154	13,049
Applied . . . . .	11,675	10,605	11,208	12,001	13,149	13,226	13,641	12,803	12,791
Life sciences . . . . .	7,070	8,115	9,474	9,910	10,499	10,551	11,031	11,036	10,894
Psychology . . . . .	336	417	482	298	537	524	577	583	576
Physical sciences . . . . .	3,374	3,885	4,087	4,439	4,315	6,470	3,979	3,926	3,896
Environmental sciences . . . . .	2,126	1,790	2,333	2,208	2,542	1,935	2,739	2,656	2,617
Mathematics and computer sciences . . . . .	406	733	902	1,160	1,194	1,183	1,423	1,370	1,369
Engineering . . . . .	4,773	4,614	4,651	4,977	5,360	3,831	5,335	5,003	5,056
Social sciences . . . . .	883	587	676	690	658	624	633	608	644
Other sciences, n.e.c. <sup>1</sup> . . . . .	590	436	712	808	1,104	1,015	838	775	788

<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. 1000. R&D Scientists and Engineers—Employment and Cost, by Industry: 1980 to 1995**

[Data are estimates; on average full-time-equivalent (FTE) basis]

INDUSTRY	1987 SIC <sup>1</sup> code	1980	1985	1989	1990	1991	1992	1993	1994	1995
<b>EMPLOYED SCIENTISTS</b>										
<b>Average FTE of scientists and engineers (1,000) <sup>2,3</sup></b> . . . . .	(X)	<b>469.2</b>	<b>646.8</b>	<b>733.1</b>	<b>758.5</b>	<b>776.4</b>	<b>772.0</b>	<b>766.6</b>	<b>758.9</b>	<b>789.5</b>
Chemicals <sup>4</sup> . . . . .	28	53.1	71.1	78.3	80.4	81.6	85.6	93.1	92.3	97.0
Machinery . . . . .	35	65.7	81.7	100.4	113.3	109.7	99.3	97.4	68.4	78.0
Electrical equipment <sup>5</sup> . . . . .	36	100.7	113.2	122.5	105.2	95.9	91.9	89.2	101.0	114.6
Motor vehicles . . . . .	371	36.7	28.7	45.8	49.4	45.3	44.5	45.1	51.2	54.1
Aircraft and missiles. . . . .	372,376	90.6	130.2	134.8	115.3	100.2	92.9	97.9	65.7	79.5
<b>CONSTANT (1992) DOLLARS <sup>6</sup></b>										
<b>Cost per scientist or engineer (\$1,000) <sup>3,7</sup></b> . . . . .	(X)	<b>164.8</b>	<b>164.7</b>	<b>153.7</b>	<b>154.9</b>	<b>157.5</b>	<b>155.6</b>	<b>151.5</b>	<b>154.6</b>	<b>155.8</b>
Chemicals <sup>4</sup> . . . . .	28	152.5	148.6	171.6	174.5	180.4	91.8	0.0	86.1	84.0
Machinery . . . . .	35	152.3	90.7	149.6	152.9	154.4	126.7	106.9	56.5	70.9
Electrical equipment <sup>5</sup> . . . . .	36	154.5	156.4	153.4	154.9	152.7	147.4	144.5	150.1	155.7
Motor vehicles . . . . .	371	234.2	142.0	(D)	(D)	(D)	(D)	(D)	(D)	79.2
Aircraft and missiles. . . . .	372,376	190.6	198.3	234.6	208.7	183.7	178.5	191.8	204.8	99.0

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, Labor Force. <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 two consecutive years divided into total R&D expenditures in each industry.

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

### No. 1001. Civilian Employment of Scientists, Engineers, and Technicians, by Occupation and Industry: 1996

[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- struc- tion	Manu- facturing	Trans- por- tation <sup>3</sup>	Trade	FIRE <sup>4</sup>	Serv- ices	Government	
Scientists, engineers, and technicians. . . . .	4,885.5	54.6	67.2	1,394.5	208.9	236.5	192.1	1,792.2	694.2	235.9
Scientists . . . . .	665.7	11.4	0.4	79.9	5.4	3.8	11.8	258.9	197.9	92.5
Physical scientists . . . . .	206.7	9.9	0.4	51.3	3.0	2.4	0.8	81.6	47.2	10.2
Life scientists . . . . .	180.0	0.2	0.1	27.1	1.2	1.4	0.4	62.9	74.7	8.3
Mathematical scientists . . . . .	15.6	(NA)	(NA)	1.5	0.4	(NA)	3.1	4.5	4.8	1.3
Social scientists . . . . .	263.5	1.3	(NA)	(NA)	0.8	(NA)	7.6	109.9	71.2	72.7
Computer systems analysts, engineers and scientists . . . . .	932.8	3.7	2.1	196.6	42.2	60.8	86.5	375.0	107.4	58.4
Engineers <sup>5</sup> . . . . .	1,382.4	18.9	31.0	620.4	68.7	39.1	10.5	370.0	177.9	45.8
Civil engineers . . . . .	196.1	0.6	10.9	7.5	5.3	0.5	0.4	86.6	71.3	13.0
Electrical/electronics . . . . .	367.2	0.6	9.4	163.6	34.6	13.5	1.3	96.1	34.9	13.1
Mechanical engineers . . . . .	227.9	1.6	5.1	131.2	4.2	7.2	(NA)	61.6	11.8	4.0
Engineering and science technicians . . . . .	1,235.8	15.7	29.4	432.8	66.9	91.7	4.3	423.0	154.9	11.8
Electrical/electronics technicians . . . . .	297.4	1.0	7.9	104.3	21.4	69.5	1.4	70.0	20.3	1.7
Engineering technicians . . . . .	400.2	4.9	4.2	150.9	25.5	11.4	0.3	105.9	92.9	3.2
Drafters . . . . .	309.9	1.9	16.9	96.5	16.7	7.1	1.3	152.2	10.2	4.6
Science technicians . . . . .	228.3	8.0	0.4	81.1	3.3	3.7	1.2	94.9	31.5	2.3
Surveyors . . . . .	100.7	2.4	2.6	0.1	2.8	(NA)	0.7	62.5	22.0	7.5
Computer programmers . . . . .	568.0	2.4	1.5	64.8	22.8	41.0	78.3	302.9	34.0	20.0

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

Source: U.S. Bureau of Labor Statistics, *Monthly Labor Review*, November 1997; and unpublished data. (Data collected biennially.)

### No. 1002. Graduate Science/Engineering Students in Doctorate-Granting Colleges: 1985 to 1996

[As of fall. Includes outlying areas]

FIELD OF SCIENCE OR ENGINEERING	TOTAL (1,000)			PERCENT—							
				Female			Foreign		Part time		
	1985	1990	1996	1985	1990	1996	1990	1996	1985	1990	1996
<b>Total, all surveyed fields . . . . .</b>	<b>355.8</b>	<b>398.8</b>	<b>430.6</b>	<b>34.5</b>	<b>37.6</b>	<b>43.1</b>	<b>25.4</b>	<b>22.8</b>	<b>32.4</b>	<b>31.1</b>	<b>29.5</b>
Science/engineering . . . . .	317.2	351.7	366.2	29.5	32.4	37.4	27.7	25.5	30.7	28.9	27.4
Engineering, total . . . . .	90.2	99.8	96.2	11.5	13.6	17.6	36.6	35.1	39.7	35.9	33.5
Sciences, total . . . . .	226.9	251.9	270.0	36.6	39.8	44.4	24.1	22.1	27.2	26.1	25.3
Physical sciences . . . . .	29.4	32.5	30.8	20.5	23.4	27.5	37.0	35.2	11.9	11.3	11.4
Environmental . . . . .	14.1	12.9	13.7	25.3	29.1	35.2	20.1	19.8	23.8	23.6	25.0
Mathematical sciences . . . . .	15.4	17.5	16.0	29.0	30.6	33.3	35.5	34.4	27.6	24.5	22.9
Computer sciences . . . . .	24.2	28.1	29.0	25.2	23.2	24.8	32.7	36.1	48.6	47.2	46.3
Agricultural sciences . . . . .	10.9	10.6	11.2	25.8	29.3	36.5	28.8	25.7	18.4	17.9	20.6
Biological sciences . . . . .	42.2	46.4	53.6	42.5	45.5	48.9	24.2	21.0	16.1	14.8	14.5
Psychology . . . . .	30.8	35.9	38.7	59.7	65.6	69.4	4.6	4.5	30.6	29.0	26.6
Social sciences . . . . .	59.9	68.0	77.1	39.8	42.8	47.9	21.7	18.7	34.4	32.9	31.0
Health fields, total. . . . .	38.7	47.2	64.4	75.7	76.9	75.4	8.6	7.2	46.2	47.4	41.2

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

**No. 1003. Science and Engineering Degree Recipients in 1993 and 1994: 1995**

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

DEGREE AND FIELD	Graduates 1993 and 1994 (1,000)	1995 <sup>1</sup> —PERCENT DISTRIBUTION				Median salary <sup>4</sup> (\$1,000)
		In school <sup>2</sup>	Employed		Not employed or not FT students	
			In S&E <sup>3</sup>	In other		
<b>Bachelor's recipients . . . . .</b>	<b>698.6</b>	<b>23</b>	<b>19</b>	<b>52</b>	<b>6</b>	<b>25.0</b>
All science fields . . . . .	580.2	25	10	59	6	22.8
Computer and mathematical sciences . . . . .	69.2	13	32	51	4	29.0
Life and related sciences . . . . .	121.1	37	10	47	5	21.8
Physical and related sciences . . . . .	33.2	39	27	30	4	25.5
Social and related sciences . . . . .	356.7	21	5	67	7	21.2
All engineering fields . . . . .	118.4	15	62	20	4	33.5
Aerospace and related engineering . . . . .	4.4	25	43	30	2	30.0
Chemical engineering . . . . .	9.6	23	58	14	5	37.7
Civil and architectural engineering . . . . .	18.1	13	67	17	3	31.0
Electrical, electronics, computer and communications engineering . . . . .	38.6	11	64	21	4	35.0
Industrial engineering . . . . .	6.4	9	59	28	3	34.0
Mechanical engineering . . . . .	28.9	12	66	17	4	34.0
Other engineering . . . . .	12.5	26	50	21	3	31.5
<b>Master's recipients . . . . .</b>	<b>146.6</b>	<b>24</b>	<b>43</b>	<b>28</b>	<b>5</b>	<b>39.0</b>
All science fields . . . . .	100.0	27	32	36	5	34.8
Computer and mathematical sciences . . . . .	24.3	14	54	28	4	43.5
Life and related sciences . . . . .	15.0	35	30	29	6	31.5
Physical and related sciences . . . . .	9.7	39	41	15	4	35.5
Social and related sciences . . . . .	51.0	27	21	46	6	30.5
All engineering fields . . . . .	46.6	20	65	11	4	43.8
Aerospace and related engineering . . . . .	1.7	24	59	(B)	(B)	43.3
Chemical engineering . . . . .	1.7	(B)	65	(B)	(B)	42.3
Civil and architectural engineering . . . . .	6.1	(B)	77	(B)	(B)	39.5
Electrical, electronics, computer and communications engineering . . . . .	16.5	21	65	(B)	(B)	46.0
Industrial engineering . . . . .	3.1	(B)	65	(B)	(B)	42.8
Mechanical engineering . . . . .	7.5	20	65	(B)	(B)	43.0
Other engineering . . . . .	10.1	21	59	16	4	44.5

<sup>1</sup> B Base figure too small to meet statistical standards of reliability of a derived figure. <sup>2</sup> As of April. <sup>3</sup> Full-time students. <sup>4</sup> In science and engineering. <sup>5</sup> For the principal job. Excludes full-time students, the self-employed, and persons whose principal job is less than 35 hours per week.

Source: National Science Foundation/SRS, *National Survey of Recent College Graduates: 1995*.

**No. 1004. Doctorates Conferred, by Recipients' Characteristics: 1990 and 1996**

[In percent, except as indicated]

CHARACTERISTIC	1990, total	1996									
		All fields <sup>1</sup>	Engi- neering	Physi- cal sci- ences <sup>2</sup>	Earth sci- ences	Math- ematics	Com- puter sci- ences	Biologi- cal sci- ences <sup>3</sup>	Agri- cul- tural	Social sci- ences <sup>4</sup>	Psy- chology
<b>Total conferred (number) . . . . .</b>	<b>36,068</b>	<b>42,415</b>	<b>6,305</b>	<b>3,838</b>	<b>794</b>	<b>1,122</b>	<b>921</b>	<b>6,760</b>	<b>1,037</b>	<b>3,999</b>	<b>3,491</b>
Male . . . . .	63.7	60	87.7	78.1	78.3	81.9	84.9	60.1	72.8	63.5	33.3
Female . . . . .	36.3	40	12.3	21.9	21.7	18.1	15.1	39.9	27.2	36.5	66.7
Median age <sup>5</sup> . . . . .	33.9	33.8	31.7	30.2	33.8	30.9	32.7	31.5	34.3	34.5	33.2
<b>CITIZENSHIP<sup>6</sup></b>											
<b>Total conferred (number) . . . . .</b>	<b>34,697</b>	<b>41,116</b>	<b>6099</b>	<b>3707</b>	<b>763</b>	<b>1087</b>	<b>889</b>	<b>5605</b>	<b>1018</b>	<b>3855</b>	<b>3407</b>
U.S. citizen . . . . .	71.8	67.5	57.6	44.1	39.5	55.2	52.7	36.8	53.6	36.7	8.4
Foreign citizen . . . . .	28.2	32.5	42.4	55.9	60.5	44.8	47.3	63.2	46.4	63.3	91.6
<b>RACE/ETHNICITY<sup>7</sup></b>											
<b>Total conferred (number) . . . . .</b>	<b>26,604</b>	<b>31,506</b>	<b>3383</b>	<b>2568</b>	<b>558</b>	<b>646</b>	<b>513</b>	<b>4365</b>	<b>576</b>	<b>2793</b>	<b>3226</b>
White <sup>8</sup> . . . . .	86.5	78.3	66.8	73.5	80.4	73.9	69.3	72.6	77	79.1	84.9
Black <sup>8</sup> . . . . .	3.8	4.6	2.1	2.3	0.7	1.8	2.3	2.2	4.3	5	4.7
Asian/Pacific <sup>8</sup> . . . . .	4.9	11.7	26.4	19.6	13.7	21.6	21.6	20.3	14	9.7	3.8
Indian/Alaskan <sup>8</sup> . . . . .	0.4	0.5	0.4	0.2	0.3	0.1	0.7	0.4	0.8	0.8	0.5
Hispanic . . . . .	3.1	3.5	2.8	2.5	3.4	1.5	3.1	3	2.2	3.4	5.3
Other/unknown . . . . .	1.4	1.4	1.5	1.9	1.5	1.1	0.3	1.5	1.7	0.2	0.8

<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*, annual.

### No. 1005. Space Vehicle Systems—Net Sales and Backlog Orders: 1965 to 1996

[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	1987	8,051	5,248	12,803	12,393	9,460	12,933
1970	1,956	1,025	931	1,184	786	398	1988	8,622	6,190	12,432	10,838	7,880	12,958
1975	2,119	1,096	1,023	1,304	1,019	285	1989	9,758	6,457	13,301	13,356	9,192	14,164
1980	3,483	1,461	2,022	1,814	951	863	1990	9,691	6,556	13,135	12,462	8,130	14,332
1981	3,856	1,736	2,120	3,174	2,164	1,010	1991	10,515	6,770	13,745	11,664	6,221	15,443
1982	4,749	2,606	2,143	4,337	2,403	1,934	1992	9,266	5,887	13,379	12,809	7,622	15,187
1983	4,940	2,420	2,520	4,865	2,733	2,132	1993	8,309	4,175	14,133	15,203	8,332	16,871
1984	5,225	3,019	2,206	4,624	3,099	1,525	1994	10,594	5,707	14,887	12,888	6,732	16,156
1985	6,300	4,241	2,059	6,707	4,941	1,766	1995	11,314	4,782	16,532	15,650	5,872	19,778
1986	6,304	4,579	1,725	8,063	6,028	2,035	1996	11,209	4,777	16,432	18,262	5,864	12,398

<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)* and, beginning 1994, Internet site <<http://www.census.gov/cir/www>>

### No. 1006. Federal Outlays for General Science, Space, and Other Technology: 1970 to 2003

[In billions of dollars. For fiscal years ending in year shown; see text, Section 9, State and Local Governments]

YEAR	CURRENT DOLLARS			CONSTANT (1992) 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	16.0	3.4	12.6
1975	4.0	1.0	3.0	10.0	2.6	7.4
1980	5.8	1.4	4.4	10.0	2.4	7.6
1983	7.9	1.6	6.3	10.9	2.3	8.7
1984	8.3	1.8	6.5	11.1	2.4	8.6
1985	8.6	2.0	6.6	11.1	2.6	8.5
1986	9.0	2.2	6.8	11.3	2.8	8.5
1987	9.2	2.2	7.0	11.2	2.7	8.5
1988	10.8	2.4	8.4	12.7	2.8	9.8
1989	12.8	2.6	10.2	14.4	2.9	11.4
1990	14.4	2.8	11.6	15.6	3.1	12.6
1991	16.1	3.1	13.0	16.5	3.2	13.3
1992	16.4	3.5	12.8	16.4	3.5	12.8
1993	17.0	3.9	13.1	16.4	3.8	12.6
1994	16.2	3.8	12.4	15.1	3.6	11.5
1995	16.7	4.1	12.6	15.2	3.7	11.5
1996	16.7	4.0	12.7	14.8	3.5	11.3
1997	17.1	4.1	13.1	14.9	3.6	11.3
1998, est.	17.1	4.9	12.2	14.3	4.1	10.2
1999, est.	17.6	5.5	12.1	14.5	4.6	10.0
2000, est.	18.1	5.9	12.2	14.7	4.8	9.9
2001, est.	18.4	6.4	12.0	14.6	5.1	9.6
2002, est.	18.7	6.6	12.2	14.5	5.1	9.4
2003, est.	18.9	6.7	12.2	14.3	5.1	9.2

Source: U.S. Office of Management and Budget, *Budget of the United States, Historical Tables, Fiscal Year 1999*, annual.

### No. 1007. U.S. Commercial Space Revenues: 1990 to 1995

[In millions of dollars. For calendar years]

INDUSTRY	1990	1991	1992	1993	1994	1995 <sup>1</sup>
<b>Total</b>	<b>3,385</b>	<b>4,370</b>	<b>4,860</b>	<b>5,295</b>	<b>6,640</b>	<b>7,850</b>
Commercial satellites delivered	1,000	1,300	1,300	1,100	1,400	1,550
Satellite services	800	1,200	1,500	1,850	2,330	2,740
Fixed	735	1,115	1,275	1,600	1,980	2,340
Mobile	65	85	225	250	350	400
Satellite ground equipment	860	1,300	1,400	1,600	1,970	2,570
Mobile-equipment	145	280	350	420	480	510
Commercial launches	570	380	450	465	580	600
Remote sensing data and services	155	190	210	250	300	330
Commercial R&D infrastructure	-	-	-	30	60	60

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

Source: U.S. Department of Commerce, International Trade Administration, *U.S. Industrial Outlook, 1994*; and unpublished data.

### No. 1008. National Aeronautics and Space Administration—Budget Summary: 1997 to 2003

[In millions of dollars]

ITEM	1997	1998	1999	2000	2001	2002	2003
<b>Total</b> . . . . .	<b>13,709</b>	<b>13,638</b>	<b>13,465</b>	<b>13,278</b>	<b>13,315</b>	<b>13,394</b>	<b>13,435</b>
Human space flight . . . . .	5,675	5,680	5,511	5,312	5,156	4,930	4,715
Space station . . . . .	2,149	2,501	2,270	2,134	1,933	1,766	1,546
U.S. and Russian cooperative program . . . . .	300	50	-	-	-	-	-
Space shuttle . . . . .	2,961	2,923	3,059	2,998	3,049	2,989	2,989
Payload and utilization operations . . . . .	265	205	182	180	174	175	180
Science, aeronautics and technology . . . . .	5,453	5,552	5,457	5,530	5,726	5,917	6,120
Space science . . . . .	1,969	1,984	2,058	2,207	2,308	2,387	2,568
Life and microgravity sciences and applications . . . . .	244	214	242	257	266	264	264
Mission to planet earth . . . . .	1,362	1,367	1,372	1,492	1,494	1,449	1,407
Aeronautical research and technology . . . . .	1,340	1,471	1,305	1,092	1,026	1,057	1,071
Mission communication services . . . . .	419	396	380	382	382	380	380
Academic programs . . . . .	120	120	100	100	100	100	100
Future planning . . . . .	(NA)	(NA)	(NA)	(NA)	150	280	330
Mission support . . . . .	2,564	2,388	2,477	2,416	2,413	2,527	2,580
Safety, reliability and quality assurance . . . . .	39	38	36	36	36	40	40
Space communication services . . . . .	291	194	177	136	125	151	121
Research and program management . . . . .	2,079	2,034	2,099	2,079	2,087	2,171	2,254
Construction of facilities . . . . .	155	122	165	165	165	165	165
Inspector General . . . . .	17	18	20	20	20	20	20

- Represents zero. NA Not available.

Source: U.S. National Aeronautics and Space Administration, *NASA Pocket Statistics*, annual.

### No. 1009. NASA Space Shuttle Operations Expenditures: 1997 to 1999

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

OPERATION	1997	1998	1999
<b>Total</b> . . . . .	<b>2,464.9</b>	<b>2,369.4</b>	<b>2,487.4</b>
Orbiter and integration . . . . .	492.6	502.9	573.4
Orbiter . . . . .	124.7	126.2	113.9
System integration . . . . .	367.9	376.7	459.5
Propulsion . . . . .	1,124.7	1,061.8	1,093.4
External tank . . . . .	352.4	341.3	404.8
Space shuttle main engine . . . . .	208.3	204.6	175.6
Reusable solid rocket motor . . . . .	412.8	380.4	362.7
Solid rocket booster . . . . .	151.2	135.5	150.3
Mission and launch operations . . . . .	847.6	804.7	820.6
Launch and landing operations . . . . .	801.4	710.1	728.4
Mission and crew operations . . . . .	46.2	94.6	92.2

Source: U.S. National Aeronautics and Space Administration, *NASA Pocket Statistics*, annual.

### No. 1010. World-Wide Successful Space Launches: 1957 to 1997

[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	1990-1994	1995	1996	1997
<b>Total</b> . . . . .	<b>3,892</b>	<b>289</b>	<b>586</b>	<b>555</b>	<b>607</b>	<b>605</b>	<b>550</b>	<b>466</b>	<b>75</b>	<b>73</b>	<b>86</b>
Soviet Union/CIS <sup>1</sup> . . . . .	2,548	82	302	405	461	483	447	283	32	25	28
United States . . . . .	1,124	207	279	139	126	93	61	122	27	33	37
Japan . . . . .	52	-	-	5	10	12	11	9	2	1	2
ESA <sup>2</sup> . . . . .	96	-	-	-	1	8	21	33	11	10	12
China . . . . .	49	-	-	2	6	6	9	15	2	3	6
France . . . . .	10	-	4	3	3	-	-	-	-	-	-
India . . . . .	8	-	-	-	-	3	-	3	-	1	1
Israel . . . . .	3	-	-	-	-	-	1	1	1	-	-
Australia . . . . .	1	-	1	-	-	-	-	-	-	-	-
United Kingdom . . . . .	1	-	-	1	-	-	-	-	-	-	-

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

Source: Library of Congress, Congressional Research Service, Science Policy Research Division, *Space Activities of the United States, CIS, and Other Launching Countries/Organizations 1957-1994*, July 31, 1995; and forthcoming report.

### No. 1011. Space Shuttle Flights—Summary: 1981 to January 1998

FLIGHT NUMBER	Mission date	Orbiter name	Crew size (up/down)	Days duration	FLIGHT NUMBER	Mission date	Orbiter name	Crew size (up/down)	Days duration
1	4/12/81	Columbia	2	2	45	3/24/92	Atlantis	7	9
2	11/12/81	Columbia	2	2	49	5/7/92	Endeavour	7	9
3	3/22/82	Columbia	2	8	50	6/25/92	Columbia	7	14
4	6/27/82	Columbia	2	7	46	7/31/92	Atlantis	7	8
5	11/11/82	Columbia	4	5	47	9/12/92	Endeavour	7	8
6	4/4/83	Challenger	4	5	52	10/22/92	Columbia	6	10
7	6/18/83	Challenger	5	6	53	12/2/92	Discovery	5	7
8	8/30/83	Challenger	5	6	54	1/13/93	Endeavour	5	6
9	11/28/83	Columbia	6	10	56	4/8/93	Discovery	5	9
10	2/3/84	Challenger	5	8	55	4/26/93	Columbia	7	10
11	4/6/84	Challenger	5	7	57	6/21/93	Endeavour	6	10
12	8/30/84	Discovery	6	7	51	9/12/93	Discovery	5	10
13	10/5/84	Challenger	7	8	58	10/18/93	Columbia	7	14
14	11/8/84	Discovery	5	8	61	12/2/93	Endeavour	7	11
15	1/24/85	Discovery	5	4	60	2/3/94	Discovery	6	8
16	4/12/85	Discovery	7	7	62	3/4/94	Columbia	5	14
17	4/29/85	Challenger	7	7	59	4/9/94	Endeavour	6	11
18	6/17/85	Discovery	7	7	65	7/8/94	Columbia	7	15
19	7/29/85	Challenger	7	8	64	9/9/94	Discovery	6	11
20	8/27/85	Discovery	5	7	68	9/30/94	Endeavour	6	11
21	10/3/85	Atlantis	5	4	66	11/3/94	Atlantis	6	11
22	10/30/85	Challenger	8	7	63	2/3/95	Discovery	6	8
23	11/26/85	Atlantis	7	7	67	3/2/95	Endeavour	7	17
24	1/12/86	Columbia	7	6	71	6/27/95	Atlantis	7/8	10
25	1/28/86	Challenger	7	-	70	7/13/95	Discovery	5	9
26	9/29/88	Discovery	5	4	69	9/7/95	Endeavour	5	11
27	12/2/88	Atlantis	5	4	73	10/20/95	Columbia	7	16
29	3/13/89	Discovery	5	5	74	11/8/95	Atlantis	5	8
30	5/4/89	Atlantis	5	4	72	1/11/96	Endeavour	6	9
28	8/8/89	Columbia	5	5	75	2/22/96	Columbia	7	16
34	10/18/89	Atlantis	5	5	76	3/2/96	Atlantis	6/5	9
33	11/22/89	Discovery	5	5	77	5/19/96	Endeavour	6	10
32	1/9/90	Columbia	5	11	78	6/20/96	Columbia	7	17
36	2/28/90	Atlantis	5	4	79	9/16/96	Atlantis	6	10
31	4/24/90	Discovery	5	5	80	11/20/96	Columbia	5	18
41	10/6/90	Discovery	5	4	81	1/12/97	Atlantis	6	10
38	11/15/90	Atlantis	5	5	82	2/11/97	Discovery	7	10
35	12/2/90	Columbia	7	9	83	4/4/97	Columbia	7	4
37	4/5/91	Atlantis	5	6	84	5/15/97	Atlantis	7/7	9
39	4/28/91	Discovery	7	8	94	7/1/97	Columbia	7	15.7
40	6/5/91	Columbia	7	9	85	8/7/97	Discovery	5	11.85
43	8/2/91	Atlantis	5	9	86	9/25/97	Atlantis	7/7	10.8
48	9/12/91	Discovery	5	5	87	11/19/97	Columbia	6	15.69
44	11/24/91	Atlantis	6	7	89	1/22/98	Endeavor	7/7	8.82
42	1/22/92	Discovery	7	8					

- Represents zero.

Source: U.S. National Aeronautics and Space Administration, Internet site <<http://www.hq.nasa.gov/ost/shuttle>> (Accessed 4 May 1998)

### No. 1012. Nobel Prize Laureates in Selected Sciences: 1901 to 1996

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

COUNTRY	1901-1996				1901-1930	1931-1945	1946-1960	1961-1975	1976-1990	1991-1995	1996
	Total	Phys-ics	Chem-istry	Physiology/ Medicine							
<b>Total</b> . . . . .	<b>441</b>	<b>152</b>	<b>126</b>	<b>163</b>	<b>93</b>	<b>49</b>	<b>74</b>	<b>92</b>	<b>98</b>	<b>27</b>	<b>8</b>
United States . . . . .	185	66	43	75	6	14	38	41	63	18	5
United Kingdom . . . . .	70	21	26	24	15	11	14	20	9	-	1
Germany <sup>1</sup> . . . . .	60	17	28	14	27	11	4	8	7	3	-
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 . . . . .	88	28	20	41	30	11	13	13	15	4	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.