Section 16
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.

The National Science Foundation (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 detailed statistical tables; info briefs; and annual, biennial, and special reports, see <http://www.nsf.gov/statistics>. Titles or the areas of coverage of these reports include the following: *Science and Engineering Indicators; National Patterns of R&D Resources; Women, Minorities, and Persons with Disabilities in 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; *Research and Development in Industry*; R&D expenditures and graduate enrollment and support in academic science and engineering; and characteristics of doctoral scientists and engineers and of recent graduates in the United States. Statistical surveys in these areas pose problems of concept and definition and the data should therefore be regarded as broad estimates rather than precise, quantitative statements. See sources for methodological and technical details.

The National Science Board's biennial *Science and Engineering Indicators* at <http://www.nsf.gov/statistics/seind10/> contains data and analysis of international and domestic science and technology, including measures of inputs and outputs.

Research and development outlays—NSF defines research as "systematic study directed toward fuller scientific knowledge of the subject studied" and development as "the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and 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 of medicine, 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.

Table 793. Research and Development (R&D) Expenditures by Source and Objective: 1980 to 2008

[In millions of dollars (63,224 represents $63,224,000,000), except as indicated]

Year	Total	Sources of funds					Objective (percent of total)			Character of work		
		Federal government	Industry	Universities\ colleges	Nonprofit	Nonfederal government [1]	Defense related [2]	Space related [3]	Other	Basic research	Applied research	Development
1980.	63,224	29,986	30,929	920	871	519	24.3	5.3	70.4	8,745	13,714	40,765
1981.	72,292	33,739	35,948	1,058	967	581	24.4	5.2	70.4	9,658	16,329	46,305
1982.	80,748	37,133	40,692	1,207	1,095	621	26.1	4.9	69.0	10,651	18,218	51,879
1983.	89,950	41,451	45,264	1,357	1,220	658	27.7	4.2	68.1	11,880	20,298	57,771
1984.	102,244	46,470	52,187	1,514	1,351	721	28.7	3.0	68.3	13,332	22,451	66,461
1985.	114,671	52,641	57,962	1,743	1,491	834	29.9	3.1	67.0	14,748	25,401	74,522
1986.	120,249	54,622	60,991	2,019	1,647	969	31.4	3.0	65.6	17,154	27,240	75,855
1987.	126,360	58,609	62,576	2,262	1,849	1,065	31.7	3.2	65.1	18,481	27,951	79,929
1988.	133,881	60,131	67,977	2,527	2,081	1,165	30.2	3.5	66.3	19,787	29,528	84,567
1989.	141,891	60,466	74,966	2,852	2,333	1,274	27.6	3.9	68.5	21,891	32,277	87,723
1990.	151,993	61,610	83,208	3,187	2,589	1,399	25.1	4.3	70.6	23,029	34,897	94,067
1991.	160,876	60,783	92,300	3,458	2,852	1,483	22.4	4.5	73.1	27,140	38,631	95,105
1992.	165,350	60,915	96,229	3,569	3,113	1,525	21.6	4.3	74.1	27,604	37,936	99,811
1993.	165,730	60,528	96,549	3,709	3,388	1,557	21.2	4.4	74.4	28,743	37,283	99,705
1994.	169,207	60,777	99,204	3,938	3,665	1,623	19.7	4.5	75.8	29,651	36,618	102,938
1995.	183,625	62,969	110,871	4,110	3,925	1,751	18.6	4.5	76.9	29,610	40,936	113,079
1996.	197,346	63,394	123,417	4,436	4,239	1,861	17.6	4.1	78.3	32,799	43,170	121,377
1997.	212,152	64,574	136,228	4,838	4,590	1,922	16.7	4.1	79.2	36,921	46,554	128,677
1998.	226,402	66,383	147,846	5,163	5,038	1,972	15.8	3.8	80.4	35,341	46,348	144,712
1999.	244,922	67,055	164,660	5,619	5,489	2,098	14.6	3.2	82.2	38,887	52,006	154,029
2000.	267,298	66,417	186,136	6,232	6,267	2,247	13.4	2.3	84.3	42,667	56,826	167,805
2001.	277,366	72,836	188,440	6,827	6,867	2,397	14.0	2.4	83.6	47,617	64,583	165,167
2002.	276,022	77,710	180,711	7,344	7,700	2,557	15.6	2.4	82.0	51,174	50,814	174,034
2003.	288,324	83,618	186,174	7,650	8,140	2,742	16.5	2.3	81.2	54,375	61,563	172,386
2004.	299,201	88,766	191,376	7,937	8,239	2,883	17.2	2.1	80.7	55,868	70,095	173,238
2005.	322,104	93,817	207,826	8,579	8,960	2,922	17.1	2.0	80.9	59,462	70,215	192,427
2006.	347,048	98,038	227,254	9,307	9,429	3,021	16.8	1.8	81.4	61,038	76,428	209,582
2007.	372,535	101,772	246,927	9,993	10,593	3,249	16.2	1.5	82.3	65,988	83,214	223,333
2008 [4] . . .	397,629	103,709	267,847	10,600	12,020	3,453	15.3	1.4	83.3	69,146	88,591	239,891

[1] Nonfederal R&D expenditures to university and college performers. [2] R&D spending by the Department of Defense, including space activities, and a portion of the Department of Energy funds. [3] For the National Aeronautics and Space Administration only. [4] Preliminary.

Source: U.S. National Science Foundation, *National Patterns of R&D Resources*, NSF 10-314, 2010. See also <www.nsf.gov/statistics/nsf10314/>.

Table 794. National Research and Development (R&D) Expenditures as a Percent of Gross Domestic Product by Country: 1990 to 2008

Year	United States	Japan [1]	Germany [2]	France	United Kingdom	Italy	Canada	South Korea	OECD total [3]	Russia [4]	China [5]
1990. . . .	2.65	2.81	2.61	2.32	2.14	1.25	1.51	(NA)	2.25	2.03	(NA)
1995. . . .	2.51	2.71	2.19	2.29	1.94	0.97	1.70	2.27	2.06	0.85	0.57
2000. . . .	2.75	3.04	2.45	2.15	1.85	1.05	1.91	2.30	2.21	1.05	0.90
2001. . . .	2.76	3.12	2.46	2.20	1.82	1.09	2.09	2.47	2.25	1.18	0.95
2002. . . .	2.66	3.17	2.49	2.23	1.82	1.13	2.04	2.40	2.22	1.25	1.07
2003. . . .	2.66	3.20	2.52	2.17	1.78	1.11	2.03	2.49	2.22	1.28	1.13
2004. . . .	2.54	3.17	2.49	2.15	1.69	1.10	2.08	2.68	2.17	1.15	1.23
2005. . . .	2.57	3.32	2.49	2.10	1.73	1.09	2.05	2.79	2.21	1.07	1.34
2006. . . .	2.61	3.41	2.53	2.10	1.76	1.13	1.97	3.01	2.24	1.07	1.42
2007. . . .	2.66	3.44	2.53	2.04	1.82	1.18	1.90	3.21	2.28	1.12	1.44
2008. . . .	2.77	(NA)	(NA)	2.02	1.88	1.18	1.84	(NA)	(NA)	1.04	(NA)

NA Not available. [1] Data on Japanese research and development after 1995 may not be consistent with data in earlier years because of changes in methodology. [2] Data for 1990 are for West Germany only. [3] Organization for Economic Cooperation and Development. [4] As of May 16, 2007 Russia is an OECD accession candidate country. [5] As of 2007 China is an OECD enhanced engagement country.

Source: Organization for Economic Cooperation and Development, *Main Science and Technology Indicators*, 2009/2nd edition (copyright). See also <http://www.oecd.org/>.

Table 795. Performance Sector of Research and Development (R&D) Expenditures: 2000 to 2008

[In millions of dollars (267,298 represents $267,298,000,000). For calendar year. FFRDCs are federally funded research and development centers]

Year	Total	Federal government	Industry			Industry FFRDC's	Universities and colleges						University & college FFRDCs [3]	Other nonprofit institutions			
			Total	Funded by—			Total	Funded by—						Total	Funded by—		
				Federal government	Industry [1]			Federal government	Nonfederal government [2]	Industry	Universities & colleges	Nonprofits			Federal government	Industry	Nonprofits
RESEARCH AND DEVELOPMENT TOTAL																	
2000	267,298	17,917	199,961	17,117	182,844	2,001	30,705	17,727	2,247	2,174	6,232	2,326	5,742	9,506	4,447	1,118	3,941
2004	299,201	22,844	208,301	20,266	188,035	2,485	43,128	27,173	2,883	2,190	7,937	2,946	7,659	12,140	5,695	1,151	5,294
2005	322,104	24,470	226,159	21,909	204,250	2,601	45,197	28,260	2,922	2,323	8,579	3,113	7,817	13,032	5,932	1,253	5,846
2006	347,048	25,556	247,669	24,304	223,365	3,122	46,983	28,815	3,021	2,515	9,307	3,325	7,306	13,469	5,992	1,374	6,103
2007	372,535	25,858	269,267	26,585	242,682	5,165	49,021	29,328	3,249	2,748	9,993	3,703	5,567	14,341	5,954	1,497	6,890
2008 [4]	397,629	27,000	289,105	25,795	263,310	6,337	51,163	30,177	3,453	2,908	10,600	4,024	4,717	15,606	5,982	1,629	7,995
BASIC RESEARCH																	
2000	42,667	3,765	7,040	925	6,115	547	22,917	13,966	1,550	1,499	4,298	1,604	2,874	4,908	2,099	621	2,188
2004	55,868	4,697	7,835	1,072	6,763	175	31,994	21,154	1,958	1,488	5,392	2,002	3,730	6,366	2,788	639	2,939
2005	59,462	4,770	8,667	1,108	7,559	136	34,044	22,198	2,043	1,625	6,000	2,177	3,820	6,844	2,903	696	3,246
2006	61,038	4,716	8,384	1,444	6,940	652	35,700	22,736	2,155	1,795	6,641	2,373	3,344	7,001	2,849	763	3,389
2007	65,988	4,600	11,268	2,780	8,488	2,258	37,323	23,070	2,351	1,989	7,233	2,680	1,724	7,466	2,809	831	3,826
2008 [4]	69,146	4,734	11,907	2,697	9,209	2,390	38,822	23,608	2,503	2,108	7,685	2,918	1,634	8,229	2,885	904	4,439
APPLIED RESEARCH																	
2000	56,826	6,105	39,176	2,682	36,494	269	6,617	3,315	572	553	1,585	592	1,329	3,113	1,831	283	999
2004	70,095	7,455	45,432	4,775	40,657	1,509	9,335	5,140	759	576	2,087	774	1,920	4,081	2,448	292	1,342
2005	70,215	7,557	45,284	5,289	39,995	1,492	9,333	5,158	721	573	2,114	768	1,912	4,231	2,432	318	1,482
2006	76,428	7,435	51,173	6,140	45,033	1,331	9,557	5,290	710	590	2,186	781	1,874	4,487	2,592	348	1,547
2007	83,214	7,303	57,570	8,945	48,625	1,168	10,003	5,542	736	623	2,264	839	1,354	4,722	2,596	379	1,746
2008 [4]	88,591	7,573	61,437	8,679	52,758	1,998	10,556	5,824	779	656	2,390	908	713	4,985	2,546	413	2,026
DEVELOPMENT																	
2000	167,805	8,047	153,745	13,510	140,235	1,185	1,172	447	125	121	348	130	1,539	1,485	517	214	754
2004	173,238	10,692	155,034	14,419	140,615	801	1,799	878	167	126	458	170	2,008	1,692	459	220	1,013
2005	192,427	12,142	172,208	15,512	156,696	974	1,820	904	158	126	464	169	2,085	1,957	598	240	1,119
2006	209,582	13,406	188,112	16,720	171,392	1,139	1,726	789	156	130	480	171	2,088	1,981	551	263	1,168
2007	223,333	13,955	200,429	14,860	185,569	1,738	1,695	716	162	137	497	184	2,488	2,154	549	286	1,318
2008 [4]	239,891	14,693	215,761	14,419	201,342	1,949	1,785	746	171	144	525	199	2,370	2,392	551	312	1,530

[1] Includes all nonfederal sources of industry R&D expenditures. [2] Includes all nonfederal sources. [3] Includes all R&D expenditures of FFRDCs administered by academic institutions and funded by the federal government. [4] Preliminary.

Source: National Science Foundation, data derived from: *Research and Development in Industry*, annual; *Academic Research and Development Expenditures*, annual; and *Federal Funds For Research and Development*, annual. See also <http://www.nsf.gov/statistics/nsf10314/>.

Table 796. Federal Obligations for Research in Current and Constant (2000) Dollars by Field of Science: 2005 to 2009

[In millions of dollars (53,738 represents $53,738,000,000). For years ending September 30. Excludes R&D plant]

Field of science	Current dollars				Constant (2000) dollars [1]			
	2005	2007	2008, prel.	2009, prel.	2005	2007	2008, prel.	2009, prel.
Research, total	**53,738**	**54,094**	**55,097**	**54,801**	**47,682**	**45,248**	**45,213**	**44,081**
Basic	27,140	26,866	27,559	28,536	24,082	22,472	22,615	22,954
Applied	26,598	27,228	27,538	26,265	23,601	22,775	22,598	21,127
Life sciences	28,128	29,464	29,675	29,299	24,958	24,645	24,351	23,567
Psychology	1,892	1,838	1,861	1,853	1,679	1,537	1,527	1,490
Physical sciences	5,494	5,136	5,249	5,593	4,875	4,296	4,308	4,499
Environmental sciences	3,503	3,171	3,315	3,352	3,108	2,652	2,720	2,697
Mathematics and computer sciences	2,983	2,946	3,285	3,333	2,647	2,464	2,696	2,681
Engineering	8,553	8,990	9,353	8,907	7,589	7,520	7,676	7,164
Social sciences	1,097	1,147	1,071	1,123	973	960	879	903
Other sciences, n.e.c. [2]	2,089	1,403	1,287	1,341	1,854	1,174	1,056	1,079

[1] Based on gross domestic product implicit price deflator. [2] Not elsewhere classified.

Source: U.S. National Science Foundation, *Federal Funds for Research and Development*, NSF 09-320, 2009. See also <http://www.nsf.gov/statistics/fedfunds/>.

Table 797. Federal Budget Authority for Research and Development (R&D) in Current and Constant (2000) Dollars by Selected Budget Functions: 2005 to 2009

[In millions of dollars (126,601 represents $126,601,000,000). For year ending September 30. Excludes R&D plant. Represents budget authority. Functions shown are those for which $1 billion or more was authorized since 2001]

Function	Current dollars				Constant (2000) dollars [1]			
	2005	2007	2008	2009, prel. [2]	2005	2007	2008	2009, prel. [2]
Total [3]	**126,601**	**138,087**	**140,113**	**157,213**	**112,335**	**115,506**	**114,979**	**126,458**
National defense	74,047	82,272	84,713	85,595	65,703	68,818	69,517	68,851
Health	28,824	29,461	29,063	39,826	25,576	24,643	23,849	32,035
Space research and technology	7,300	9,024	8,323	8,629	6,477	7,548	6,830	6,941
Energy	1,296	1,893	1,896	2,921	1,150	1,583	1,556	2,350
General science	6,570	7,809	8,234	11,634	5,830	6,532	6,757	9,358
Natural resources and environment	2,168	1,936	2,106	2,293	1,924	1,619	1,728	1,844
Transportation	1,847	1,361	1,394	1,562	1,639	1,138	1,144	1,256
Agriculture	1,820	1,857	1,864	1,927	1,615	1,553	1,530	1,550

[1] Based on gross domestic product implicit price deflator. [2] Includes ARRA (American Recovery and Reinvestment Act) funds. [3] Includes other functions, not shown separately.

Source: U.S. National Science Foundation, *Federal R&D Funding by Budget Function*, NSF 10-317, 2010. See also <http://www.nsf.gov/statistics/nsf10317/>.

Table 798. Federal Research and Development (R&D) by Federal Agency: Fiscal Year (FY) 2008 and 2009

[In millions of dollars (144,456 represents $144,456,000,000). For years ending September 30. R&D refers to actual research and development activities as well as R&D facilities. R&D facilities (also known as R&D plants) includes construction, repair, or alteration of physical plant used in the conduct of R&D. Based on Office of Management and Budget data]

Federal agency	2008	2009	Federal agency	2008	2009
Total research and development	**144,456**	**145,605**			
Defense R&D	85,129	85,309	Department of Veterans Affairs	886	943
Nondefense R&D	59,326	60,297	Department of Homeland Security	995	1,096
			Department of Transportation	875	925
Department of Defense	81,166	81,484	Department of Interior	683	702
Science and technology	13,045	13,967	U.S. Geological Survey	586	615
All other Department of Defense R&D	68,122	67,517	Environmental Protection Agency	548	563
Health and Human Services	29,250	31,058	Department of Education	313	312
National Institute of Health	28,532	29,752	Smithsonian	194	216
All other Health and Human Services R&D	718	1,306	International Assistance Programs	152	152
Department of Energy	9,769	10,301	Department of Housing and Urban Development	50	58
Atomic Energy Defense	3,963	3,825	Department of State	103	103
Office of Science	3,807	4,372	Nuclear Regulatory Commission	71	101
Energy R&D	1,999	2,104	Department of Justice	81	94
NASA	11,183	8,788	Social Security Administration	27	35
National Science Foundation	4,506	4,767	U.S. Postal Service	43	43
Department of Agriculture	2,332	2,437	Tennessee Valley Authority	20	18
Department of Commerce	1,188	1,389	Army Corps of Engineers	11	11
National Oceanic and Atmospheric Administration	633	785	Telecommunications Development Agency	5	6
National Institute of Standards and Technology	498	553	Department of Labor	4	4

Source: American Association for the Advancement of Science (AAAS), AAAS Report XXXIV *Research and Development FY 2010*, annual (copyright). See also <http://www.aaas.org/spp/rd/rdreport2010/>.

Table 799. Research and Development (R&D) Funds in R&D-Performing Manufacturing and Nonmanufacturing Companies by Industry: 2005 to 2007

Industry	NAICS [1] code	Total R&D funds as a percent of net sales			Company R&D funds as a percent of net sales		
		2005	2006	2007	2005	2006	2007
All industries, total	**(X)**	**3.7**	**3.7**	**3.8**	**3.3**	**3.4**	**3.5**
All manufacturing industries, total	**(X)**	**4.0**	**4.0**	**4.1**	**3.6**	**3.6**	**3.7**
Food	311	0.7	0.7	(D)	0.7	0.7	0.7
Paper, printing, and support activities	322, 323	(D)	(D)	(D)	1.5	1.2	1.3
Petroleum and coal products	324	(D)	0.3	(D)	0.4	0.3	0.3
Chemicals	325	6.9	7.6	(D)	6.9	7.5	7.9
Plastic and rubber products	326	2.0	2.0	(D)	1.9	1.9	1.5
Nonmetallic mineral products	327	1.8	2.1	1.8	1.8	1.9	1.8
Primary metals	331	0.6	0.5	0.6	0.5	0.5	0.6
Fabricated metal products	332	0.8	1.4	1.7	0.8	1.4	1.6
Machinery	333	3.7	3.6	3.7	3.6	3.6	3.7
Navigational, measuring, electromedical, and control instruments	3345	12.8	13.1	10.2	7.0	7.5	6.1
Electrical equipment, appliances, and components	335	2.4	2.6	3.1	2.3	2.5	3.0
Transportation equipment	336	(D)	(D)	(D)	3.0	2.9	3.1
Motor vehicles, trailers, and parts	3361–3363	(D)	(D)	(D)	2.5	2.4	2.4
Aerospace products and parts	3364	6.6	6.7	7.0	4.8	4.9	5.1
All nonmanufacturing industries, total	**(X)**	**3.2**	**3.2**	**3.4**	**2.9**	**2.9**	**3.0**
Information	51	5.4	5.3	(D)	5.3	5.2	5.1
Internet service and data processing providers	518	9.1	9.6	(D)	8.7	9.4	9.6
Software publishing	5112	21.9	(D)	(D)	21.9	19.9	19.6
Professional, scientific, and technical services	54	12.2	9.5	11.7	10.0	7.6	9.5
Architectural, engineering, and related services	5413	9.4	14.4	12.0	4.9	10.7	8.1
Computer systems design and related services	5415	10.0	5.3	7.0	9.6	4.9	6.6
Scientific R&D services	5417	35.6	35.1	42.0	27.4	24.2	30.0

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.
[1] North American Industry Classification System 1997 (NAICS); see text, Section 15.

Source: U.S. National Science Foundation, *Research and Development in Industry*, annual. See also <www.nsf.gov/statistics/>.

Table 800. Funds for Performance of Industrial Research and Development (R&D) by Source of Funds and Selected Industries: 2004 to 2007

[In millions of dollars (208,301 represents $208,301,000,000). For calendar years. Covers basic research, applied research, and development. Based on the Survey of Industry Research and Development.

Industry	NAICS [1] code	2004	2005	2006	2007
CURRENT DOLLARS					
Total funds [2]	**(X)**	**208,301**	**226,159**	**247,669**	**269,267**
Company and other funds	(X)	188,035	204,250	223,365	242,682
Federal funds	(X)	20,266	21,909	24,304	26,585
Petroleum and coal products	324	1,603	(D)	1,432	(D)
Chemicals and allied products	325	(D)	42,995	46,329	(D)
Pharmaceuticals and medicines	3254	31,477	34,839	38,901	(D)
Machinery	333	6,579	8,531	9,848	9,865
Computer and electronic products	334	48,296	(D)	56,773	58,599
Navigational, measuring, electromedical, and control instruments	3345	15,214	15,204	18,300	20,438
Electrical equipment, appliances, and components	335	2,664	2,424	2,281	(D)
Motor vehicles, trailers, and parts	3361–3363	15,677	(D)	(D)	(D)
Aerospace products and parts	3364	13,086	15,055	16,367	18,436
Information	51	22,593	23,836	26,883	(D)
Professional, scientific, and technical services	54	28,709	32,021	38,049	40,533
Computer systems design and related services	5415	11,575	13,592	14,841	14,407
Scientific R&D services	5417	11,355	12,299	14,525	16,849
CONSTANT (2000) DOLLARS [3]					
Total funds [2]	**(X)**	**190,351**	**200,088**	**212,271**	**224,732**
Company and other funds	(X)	171,831	180,704	191,440	202,544
Federal funds	(X)	18,520	19,383	20,830	22,188
Petroleum and coal products	324	1,465	(D)	1,227	(D)
Chemicals	325	(D)	38,039	39,707	(D)
Pharmaceuticals and medicines	3254	28,765	30,823	33,341	(D)
Machinery	333	6,012	7,548	8,440	8,233
Computer and electronic products	334	44,134	(D)	48,659	48,907
Navigational, measuring, electromedical, and control instruments	3345	13,903	13,451	15,684	17,058
Electrical equipment, appliances, and components	335	2,434	2,145	1,955	(D)
Motor vehicles, trailers, and parts	3361–3363	14,326	(D)	(D)	(D)
Aerospace products and parts	3364	11,958	13,319	14,028	15,387
Information	51	20,646	21,088	23,041	(D)
Professional, scientific, and technical services	54	26,235	28,330	32,611	33,829
Computer systems design and related services	5415	10,578	12,025	12,720	12,024
Scientific R&D services	5417	10,376	10,881	12,449	14,062

D Figure withheld to avoid disclosure of information pertaining to a specific organization or individual. X Not applicable.
[1] 1997 North American Industry Classification System; see text, Section 15. [2] Includes other industries not shown separately.
[3] Based on gross domestic product implicit price deflator.

Source: U.S. National Science Foundation, *Research and Development in Industry*, annual. See also <www.nsf.gov/statistics/>.

Table 801. Academic and Industrial Research and Development (R&D) Performed by State: 2007

[In millions of dollars (49,021 represents 49,021,000,000). For definition of Research and Development, see text, this section]

State	Academic R&D (mil. dol.)	Academic R&D per $1,000 of state GDP	Industry-performed R&D (mil. dol.)	Industry R&D per $1,000 of state GDP	State	Academic R&D (mil. dol.)	Academic R&D per $1,000 of state GDP	Industry-performed R&D (mil. dol.)	Industry R&D per $1,000 of state GDP
U.S. [1]	**49,021**	**3.55**	**269,267**	**19.50**	MO	941	4.11	2,736	11.95
AL	655	3.98	1,771	[2] 10.76	MT	179	5.22	134	3.91
AK	160	3.56	58	1.29	NE	365	4.54	489	6.09
AZ	783	3.18	3,846	15.64	NV	192	1.48	567	4.38
AR	240	2.52	339	3.56	NH	307	5.31	1,814	[3] 31.37
CA	6,734	3.74	64,187	35.62	NJ	865	1.88	17,892	38.79
CO	873	3.70	5,223	22.15	NM	410	5.45	568	7.55
CT	691	3.26	9,444	44.49	NY	3,964	3.59	10,916	9.88
DE	126	2.05	1,472	23.92	NC	1,885	4.83	6,829	17.49
DC	333	3.60	379	4.10	ND	169	5.93	126	4.42
FL	1,558	2.10	4,569	6.16	OH	1,807	3.91	7,265	15.71
GA	1,389	3.55	2,788	7.13	OK	299	2.19	527	3.86
HI	274	4.42	218	3.52	OR	575	3.63	3,629	[3] 22.92
ID	114	2.19	726	13.93	PA	2,438	4.57	10,387	19.48
IL	1,867	3.02	11,362	18.40	RI	230	4.93	411	8.80
IN	894	3.59	4,939	19.82	SC	569	3.75	1,426	9.40
IA	587	4.52	1,202	9.25	SD	82	2.33	132	3.75
KS	376	3.21	1,304	11.15	TN	761	3.10	1,638	6.68
KY	503	3.31	890	5.85	TX	3,417	2.98	13,889	12.09
LA	604	2.91	373	[2] 1.80	UT	415	3.93	1,764	16.71
ME	137	2.85	265	5.52	VT	115	4.67	413	16.77
MD	2,542	9.61	3,665	13.86	VA	971	2.53	4,840	12.60
MA	2,172	6.17	19,488	55.34	WA	981	3.16	12,687	40.89
MI	1,510	3.97	15,736	41.42	WV	167	2.89	233	4.03
MN	637	2.52	6,636	26.28	WI	1,067	4.57	3,411	14.61
MS	411	4.69	279	3.18	WY	80	2.54	37	[2] 1.17

[1] National totals for calendar year 2007. Includes $3.3 billion of industrial R&D expenditures that year that could not be allocated to specific states. [2] Estimated, more than 50 percent of the industrial R&D value is imputed due to raking of state data. [3] More than 50 percent of the industrial R&D value is imputed.

Source: National Science Foundation, *National Patterns of R&D Resources*, NSF-10-314, 2010. See also <http://www.nsf.gov/statistics/nsf10314/>.

Table 802. Research and Development (R&D) Expenditures in Science and Engineering at Universities and Colleges in Current and Constant (2000) Dollars: 2000 to 2008

[In millions of dollars (30,084 represents $30,084,000,000). Totals may not add due to rounding]

Characteristic	Current dollars				Constant (2000) dollars [1]			
	2000	2005	2007	2008	2000	2005	2007	2008
Total	**30,084**	**45,799**	**49,554**	**51,909**	**30,084**	**40,638**	**41,395**	**42,354**
Basic research [2]	22,547	34,368	37,842	39,408	22,547	30,495	31,611	32,154
Applied R&D [2]	7,537	11,432	11,712	12,501	7,537	10,144	9,784	10,200
Source of funds:								
Federal government	17,548	29,209	30,458	31,231	17,548	25,917	25,443	25,482
State and local government	2,200	2,940	3,143	3,418	2,200	2,609	2,626	2,789
Institutions' own funds	5,925	8,266	9,748	10,435	5,925	7,335	8,143	8,514
Industry	2,156	2,291	2,680	2,870	2,156	2,033	2,239	2,342
Other	2,255	3,093	3,525	3,954	2,255	2,744	2,945	3,226
Fields:								
Physical sciences	2,713	3,704	3,859	3,933	2,713	3,287	3,224	3,209
Environmental sciences	1,766	2,555	2,724	2,800	1,766	2,267	2,275	2,285
Mathematical sciences	342	495	573	621	342	439	479	507
Computer sciences	877	1,406	1,421	1,468	877	1,248	1,187	1,198
Life sciences	17,471	27,605	29,838	31,215	17,471	24,494	24,925	25,469
Psychology	517	826	872	929	517	733	728	758
Social sciences	1,300	1,685	1,798	1,940	1,300	1,495	1,502	1,583
Other sciences	543	778	943	1046	543	690	788	853
Engineering	4,557	6,746	7,525	7,957	4,557	5,986	6,286	6,492

[1] Based on gross domestic product implicit price deflator (updated March 2009). [2] Basic research and applied R&D statistics were re-estimated for FY1998 and forward. These data are not directly comparable to those from earlier years.

Source: U.S. National Science Foundation, *Survey of Research and Development Expenditures at Universities and Colleges*, annual. See also <http://www.nsf.gov/statistics/srvyrdexpenditures/>.

Table 803. Federal Research and Development (R&D) Obligations to Selected Universities and Colleges: 2006 and 2007

[In millions of dollars (24,991.8 represents $24,991,800,000). For years ending September 30. For the top 40 institutions receiving federal R&D funds in 2007. 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 2007 federal R&D obligations	2006	2007	Major institution ranked by total 2007 federal R&D obligations	2006	2007
Total, all institutions [1]	**24,991.8**	**24,998.0**	Cornell University	299.1	326.1
Johns Hopkins University	1,153.2	1,054.9	Pennsylvania State University	291.8	320.8
University of Washington	612.1	608.0	Case Western Reserve University	277.9	278.9
University of Michigan	516.2	501.5	University Southern California	265.5	260.3
University of Pennsylvania	497.5	498.5	University of Rochester	252.3	255.2
University of California—Los Angeles	477.6	480.0	Northwestern University	222.2	254.2
Duke University	472.5	470.7	University of Chicago	219.8	248.6
University of California—San Francisco	441.9	433.4	Emory University	228.1	247.9
University of California—San Diego	401.2	432.7	University of California—Davis	236.4	243.1
Harvard University	420.8	429.3	University of Alabama—Birmingham	235.4	235.1
University of Pittsburgh	425.4	425.9	Baylor College of Medicine	236.5	227.9
Columbia University—City of NY	467.8	425.7	University of California—Irvine	161.3	219.6
Stanford University	455.9	424.0	Ohio State University	205.9	217.2
Washington University	410.7	407.8	University of California—Berkeley	228.6	214.2
Yale University	361.7	387.3	University of Arizona	200.7	212.0
Massachusetts Institute of Technology	357.1	380.8	University of Illinois—Urbana Champaign	184.6	210.5
University of Minnesota	331.2	370.7	Boston University	204.7	208.5
University of Wisconsin—Madison	373.7	369.2	University of Iowa	193.0	208.4
University of North Carolina at Chapel Hill	343.4	353.5	The Scripps Research Institute	217.5	199.0
University of Colorado	340.1	330.0	University of Virginia	176.3	198.4
Vanderbilt University	306.4	329.6			

[1] Includes other institutions, not shown separately.

Source: U.S. National Science Foundation, *Federal S&E Support to Universities and Colleges and Nonprofit Institutions*, NSF 09-313, 2009. See also <http://www.nsf.gov/statistics/fedsupport/>.

Table 804. Graduate Science/Engineering Students in Doctorate-Granting Colleges by Characteristic and Field: 1990 to 2007

[In thousands (409.4 represents 409,400). As of fall. Includes outlying areas]

Field of science or engineering	Total			Characteristic							
				Female			Foreign		Part-time		
	1990	2000	2007	1990	2000	2007	2000	2007	1990	2000	2007
Total, all surveyed fields	**409.4**	**443.5**	**561.4**	**155.5**	**201.8**	**272.3**	**123.3**	**151.2**	**130.8**	**123.6**	**151.9**
Science/engineering	360.6	374.8	469.5	117.9	150.3	201.7	118.0	143.5	107.5	99.3	119.4
Engineering, total	101.0	98.8	124.4	13.8	19.7	28.6	46.3	57.2	36.7	28.2	33.5
Sciences, total [1]	259.6	275.9	345.1	104.2	130.7	173.1	71.7	86.3	70.8	71.1	85.9
Physical sciences	32.9	29.6	35.8	7.7	8.8	11.6	11.5	14.2	3.9	3.5	3.4
Environmental	13.1	13.0	13.4	3.8	5.3	6.3	2.6	2.6	3.2	2.8	2.8
Mathematical sciences	18.1	14.4	19.2	5.6	5.2	6.9	5.9	7.3	4.7	3.0	4.2
Computer sciences	29.2	40.3	43.6	6.8	11.7	10.8	19.7	20.6	14.1	16.7	15.7
Agricultural sciences	11.0	11.3	12.5	3.2	4.8	6.1	2.4	2.8	2.0	2.4	3.3
Biological sciences	46.7	53.1	67.5	21.4	27.8	38.0	11.6	16.2	7.2	7.6	9.2
Psychology	38.5	40.3	48.1	25.5	29.0	36.1	2.1	2.7	12.0	10.8	13.8
Social sciences	70.0	73.9	91.3	30.1	38.1	48.6	15.8	17.7	23.8	24.3	28.9
Health fields, total	48.8	68.8	91.8	37.6	51.5	70.5	5.4	7.7	23.3	24.3	32.5

[1] For 2007, includes other sciences, not shown separately.

Source: U.S. National Science Foundation, *Survey of Graduate Science Engineering Students and Postdoctorates,* annual. See also <http://www.nsf.gov/statistics/gradpostdoc>.

Table 805. Non-U.S. Citizens Awarded Doctorates in Science and Engineering by Visa Type and Country of Citizenship: 1998 to 2007

[For description of science and engineering fields, see Table 809]

Visa and country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
All non-U.S. citizens	**9,736**	**8,894**	**9,070**	**9,217**	**8,867**	**9,483**	**10,158**	**11,519**	**12,777**	**13,545**
Canada	286	289	294	306	316	324	380	368	362	397
Mexico	176	172	208	206	182	218	181	206	182	182
Brazil	164	164	131	142	126	108	136	156	139	122
France	76	79	83	85	92	87	92	113	124	129
Germany	210	183	229	220	197	192	185	182	176	162
China	2,503	2,234	2,379	2,407	2,402	2,503	2,878	3,482	4,279	4,395
Japan	155	158	201	149	157	201	186	211	222	235
Korea	822	760	754	865	856	958	1,057	1,179	1,220	1,137
Taiwan	910	746	676	539	469	440	394	444	431	462
Thailand	122	134	153	237	264	314	272	252	199	224
India	1,134	915	834	818	681	773	864	1,110	1,525	1,956
Iran	93	92	80	100	59	68	60	136	148	156
Turkey	172	192	275	307	345	374	344	342	357	436
Science	6,678	6,299	6,269	6,129	5,945	6,305	6,605	7,481	8,209	8,676
Engineering	3,058	2,595	2,801	3,088	2,922	3,178	3,553	4,038	4,568	4,869
Permanent visa	1,991	1,654	1,409	1,271	1,173	1,099	1,003	1,113	1,252	1,222
Temporary visa	7,745	7,240	7,661	7,946	7,694	8,384	9,155	10,406	11,525	12,323

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, NSF 09-311, 2009. See also <http://www.nsf.gov/statistics/nsf09311/>.

Table 806. Science and Engineering (S&E) Degrees Awarded by Degree Level and Sex of Recipient: 1990 to 2008

[For a description of science and engineering degree categories, see source, Appendix B, <http://www.nsf.gov/statistics/nsf07307/content.cfm?pub_id=3634&id=4>]

Academic year ending	Bachelor's degree				Master's degree				Doctoral degree			
	Total S&E	Men	Women	Percent women	Total S&E	Men	Women	Percent women	Total S&E	Men	Women	Percent women
1990	329,094	189,082	140,012	42.5	77,788	51,230	26,558	34.1	22,867	16,498	6,369	27.9
2000	400,059	198,060	201,999	50.5	95,194	53,616	41,578	43.7	25,912	16,518	9,394	36.2
2005	499,133	246,356	252,777	50.6	121,180	67,067	54,113	44.7	27,941	17,404	10,537	37.7
2006	507,175	250,017	257,158	50.7	120,733	66,042	54,691	45.3	29,836	18,367	11,469	38.4
2007	514,509	253,934	260,575	50.6	119,685	64,695	54,990	45.9	31,768	19,509	12,259	38.5
2008	524,420	258,781	265,639	50.7	125,803	68,352	57,451	45.7	32,804	19,845	12,959	39.5

Source: U.S. National Science Foundation, *Science and Engineering Degrees: 1966–2006*, NSF-08-321, 2008, and unpublished data. See also <http://www.nsf.gov/statistics/degrees/>.

Table 807. Science and Engineering (S&E) Degrees as Share of Higher Education Degrees Conferred by State: 2007

[S&E degrees include physical, computer, agricultural, biological, earth, atmospheric, ocean, and social sciences; psychology; mathematics; and engineering]

State	S&E degrees conferred [1]	All higher education degrees [1]	S&E higher education degrees (percent)	State	S&E degrees conferred [1]	All higher education degrees [1]	S&E higher education degrees (percent)	State	S&E degrees conferred [1]	All higher education degrees [1]	S&E higher education degrees (percent)
U.S.	**685,914**	**2,138,003**	**32.1**								
AL	9,920	32,207	30.8	KY	7,218	27,152	26.6	ND	1,731	7,042	24.6
AK	750	2,261	33.2	LA	7,767	28,224	27.5	OH	24,410	82,584	29.6
AZ	13,463	74,778	18.0	ME	2,733	8,532	32.0	OK	7,442	24,244	30.7
AR	3,440	14,835	23.2	MD	16,932	41,936	40.4	OR	8,387	23,655	35.5
CA	89,947	204,838	43.9	MA	26,363	78,421	33.6	PA	35,314	113,396	31.1
CO	13,729	35,981	38.2	MI	23,006	75,304	30.6	RI	3,875	12,724	30.5
CT	9,052	27,781	32.6	MN	12,571	45,085	27.9	SC	7,649	25,841	29.6
DE	2,325	7,642	30.4	MS	4,294	16,438	26.1	SD	2,204	6,386	34.5
DC	8,287	20,489	40.4	MO	13,515	53,828	25.1	TN	9,272	36,576	25.3
FL	27,510	91,561	30.0	MT	2,450	6,509	37.6	TX	40,387	130,830	30.9
GA	16,566	49,495	33.5	NE	4,115	15,765	26.1	UT	8,787	23,993	36.6
HI	2,511	7,330	34.3	NV	2,267	7,279	31.1	VT	2,880	7,042	40.9
ID	2,859	9,614	29.7	NH	3,725	11,207	33.2	VA	20,679	53,981	38.3
IL	30,055	101,537	29.6	NJ	16,851	46,676	36.1	WA	14,206	37,541	37.4
IN	14,442	51,564	28.0	NM	3,302	9,748	33.9	WV	3,239	13,707	23.6
IA	7,893	25,698	30.7	NY	55,360	185,736	29.8	WI	13,691	41,842	32.7
KS	6,552	23,943	27.4	NC	19,022	55,071	34.5	WY	1,149	2,154	53.3

[1] Includes bachelor's, master's, and doctorate degrees.

Source: National Science Foundation, *Science and Engineering Indicators, 2010*, January 2010. See also <http://www.nsf.gov/statistics/seind10/>.

Table 808. Doctorates Conferred by Characteristics of Recipients: 2000 and 2008

[In percent, except as indicated. Based on the Survey of Earned Doctorate Awards. For description of methodology, see source]

Characteristic	2000, total [1]	2008									
		All fields [1]	Engineering	Physical sciences [2]	Earth sciences	Mathematics	Computer sciences	Biological sciences [3]	Agricultural	Social sciences [4]	Psychology
Total conferred (number)	**41,365**	**48,802**	**7,862**	**4,081**	**862**	**1,400**	**1,786**	**7,793**	**1,090**	**4,592**	**3,361**
Male	56.0	53.8	78.4	72.5	63.5	69.0	77.6	49.5	57.8	51.0	29.7
Female	43.8	46.1	21.5	27.5	36.4	30.9	22.4	50.4	42.2	49.0	70.3
RACE/ETHNICITY [5]											
Total conferred (number)	**29,936**	**30,791**	**2,948**	**2,132**	**533**	**667**	**695**	**5,135**	**602**	**2,889**	**2,886**
White [6]	79.2	75.4	70.9	78.4	88.0	78.3	72.7	74.4	81.2	74.8	75.0
Black [6]	5.8	6.6	3.8	3.0	1.7	4.5	3.7	3.7	4.7	6.9	5.7
Asian/Pacific [6]	7.6	8.3	16.7	10.1	4.7	9.0	16.8	11.7	6.1	7.4	5.1
Indian/Alaskan [6]	0.6	0.4	0.2	0.1	0.4	0.0	0.0	0.4	0.8	0.3	0.5
Hispanic	4.4	5.7	4.5	4.7	3.2	4.3	2.9	6.1	4.0	5.9	9.6
Other/unknown [7]	2.4	3.6	3.9	3.7	2.1	3.9	3.9	3.7	3.2	4.7	4.1

[1] Includes other fields, not shown separately. [2] Astronomy, physics, and chemistry. [3] Biochemistry, botany, microbiology, physiology, zoology, and related fields. [4] Anthropology, sociology, political science, economics, international relations and related fields. [5] Excludes those with temporary visas. [6] Non-Hispanic. [7] 2008 data includes Native Hawaiians and Other Pacific Islanders, respondents choosing multiple races (excluding those selecting an Hispanic ethnicity), and respondents with unknown race/ethnicity.

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, NSF-10-308, annual. See also <http://www.nsf.gov/statistics/doctorates/>.

Table 809. Doctorates Awarded by Field of Study and Year of Doctorate: 2000 to 2008

Field of Study	2000	2003	2004	2005	2006	2007	2008
Total, all fields	**41,366**	**40,758**	**42,118**	**43,381**	**45,615**	**48,112**	**48,802**
Science and engineering, total	**25,966**	**25,282**	**26,274**	**27,986**	**29,863**	**31,800**	**32,827**
Engineering, total	5,323	5,281	5,777	6,427	7,185	7,744	7,862
Aeronautical/astronautical	214	200	201	219	238	267	265
Chemical	619	568	638	774	799	807	872
Civil	480	552	547	622	655	701	712
Electrical	1,330	1,238	1,389	1,547	1,786	1,968	1,887
Industrial/manufacturing	176	214	217	221	234	280	281
Materials/metallurgical	404	438	474	493	583	648	636
Mechanical	807	752	754	892	1,044	1,072	1,079
Other	1,293	1,319	1,557	1,659	1,846	2,001	2,130
Science, total	20,643	20,001	20,497	21,559	22,678	24,056	24,965
Biological/agricultural sciences	6,890	6,756	6,987	7,404	7,682	8,313	8,883
Agricultural sciences	1,037	1,060	1,045	1,038	1,033	1,134	1,090
Biological sciences	5,853	5,696	5,942	6,366	6,649	7,179	7,793
Earth, atmospheric, and ocean sciences, total	694	683	686	714	757	878	862
Atmospheric	143	139	126	145	146	167	186
Earth/ocean sciences	551	544	560	569	611	711	676
Mathematical/computer sciences, total	1,911	1,860	2,024	2,334	2,778	3,049	3,186
Computer sciences	861	867	948	1,129	1,453	1,656	1,786
Mathematics	1,050	993	1,076	1,205	1,325	1,393	1,400
Physical sciences, total	3,378	3,287	3,335	3,643	3,927	4,102	4,081
Astronomy	185	167	165	186	197	223	248
Chemistry	1,989	2,040	1,986	2,126	2,362	2,325	2,247
Physics	1,204	1,080	1,184	1,331	1,368	1,554	1,586
Psychology	3,615	3,276	3,326	3,323	3,258	3,292	3,361
Social sciences, total	4,155	4,139	4,139	4,141	4,276	4,422	4,592
Economics	1,086	1,050	1,069	1,183	1,143	1,180	1,202
Political science	986	1,025	947	990	1,000	1,038	1,017
Sociology	617	597	580	536	578	576	601
Other social sciences	1,466	1,467	1,543	1,432	1,555	1,628	1,772
Non-science and engineering, total	**15,400**	**15,476**	**15,844**	**15,395**	**15,752**	**16,312**	**15,975**
Education	6,437	6,643	6,633	6,225	6,120	6,444	6,578
Health	1,591	1,633	1,719	1,784	1,905	2,129	2,094
Humanities	5,213	5,020	5,012	4,950	5,125	4,893	4,503
Professional/other/unknown	2,159	2,180	2,480	2,436	2,602	2,846	2,800

Source: U.S. National Science Foundation, *Science and Engineering Doctorate Awards*, annual. See also <http://www.nsf.gov/statistics/doctorates/>.

Table 810. Scientists and Engineers by Selected Demographic Characteristics: 2006

[In thousands (22,630 represents 22,630,000). Scientists and engineers refer to all persons who have received a bachelor's degree or higher in science and engineering (S&E), or S&E related field, plus persons holding a non-S&E degree or higher, employed in S&E or S&E related field]

Characteristic	Both sexes	Female	Male	Characteristic	Both sexes	Female	Male
All scientists and engineers	**22,630**	**10,230**	**12,400**	Highest degree attained:			
				Bachelor's	13,228	6,223	7,005
Age:				Master's	6,411	3,039	3,373
29 or younger	2,732	1,542	1,190	Doctorate	1,018	308	710
30-39 years	5,302	2,596	2,705	Professional	1,973	660	1,312
40-49 years	5,849	2,699	3,150				
50-59 years	5,400	2,303	3,097	Citizenship status:			
60-69 years	2,497	835	1,662	U.S. citizen, native	19,131	8,743	10,387
70 or older	851	254	596	U.S. citizen, naturalized	2,373	1,062	1,311
				Non-U.S. citizen, permanent			
Race/ethnicity:				resident	835	330	505
American Indian/Alaska Native	102	51	50	Non-U.S. citizen, temporary			
Asian	2,255	994	1,261	resident	291	95	196
Black	1,258	738	520				
Native Hawaiian/Other Pacific				Marital status:			
Islander	85	33	53	Married	16,100	6,655	9,445
White	17,420	7,670	9,751	Living in marriage-like			
Multiple race	316	156	159	relationship	892	482	410
Hispanic, any race	1,193	588	605	Widowed	356	245	111
				Separated	243	131	111
Children in the home?				Divorced	1,518	887	631
Yes	10,966	5,015	5,951	Never married	3,521	1,829	1,692
No	11,664	5,215	6,449				

Source: National Science Foundation, Division of Science Resource Statistics, Scientists and Engineers Statistical Data System (SESTAT), <http://www.nsf.gov/statistics/sestat/>, accessed March 2008.

Table 811. Civilian Employment of Scientists, Engineers, and Related Occupations by Occupation and Industry: 2008

[In thousands (293.0 represents 293,000). Standard Occupational Classification system categorize workers in 1 of 801 detailed occupations. Industry classifications correspond to 2007 North American Industry Classification (NAICS) industrial groups. For definition of scientists and engineers, see text this section and Table 802]

Occupation	Total employment, all workers	Wage and salary workers						Self employed [2]
		Mining (NAICS 21) [1]	Construction (NAICS 23)	Manufacturing (NAICS 31–33)	Information (NAICS 51)	Professional, scientific and technical services (NAICS 54)	Government (NAICS 99)	
Computer and information systems managers	293.0	0.4	0.7	27.5	33.6	73.5	19.0	9.6
Engineering managers	184.0	1.8	5.0	74.9	5.2	59.2	15.7	1.1
Natural science managers	44.6	0.2	(NA)	6.9	(NA)	16.2	13.8	(NA)
Computer and mathematical scientists	3,540.4	7.6	(NA)	272.7	422.3	1,121.5	247.4	155.3
Computer specialists	3,424.3	7.1	9.8	266.1	415.7	1,096.0	228.2	154.6
Mathematical science occupations	116.1	(NA)	0.2	6.6	6.5	25.5	19.2	0.8
Surveyors, cartographers, and photogrammetrists	70.0	0.8	3.8	0.1	(NA)	50.4	10.1	1.8
Engineers [3]	1,571.9	26.1	47.7	559.6	41.5	468.8	190.3	41.8
Aerospace engineers	71.6	(NA)	(NA)	38.4	(NA)	17.8	9.5	2.4
Civil engineers	278.4	0.8	31.1	2.5	0.8	141.0	75.4	12.0
Computer and hardware engineers	74.7	(NA)	(NA)	32.1	3.5	24.5	4.7	1.0
Electrical and electronics engineers	301.5	0.3	4.8	105.3	32.4	76.9	26.4	4.8
Industrial engineers [4]	240.4	2.4	6.4	155.2	2.5	33.5	6.1	1.8
Mechanical engineers	238.7	1.3	3.1	121.2	0.2	69.7	12.3	5.5
Drafters, engineering, and mapping technicians [5]	826.2	5.3	26.0	229.8	22.4	315.0	108.5	15.1
Engineering technicians	497.3	3.9	5.1	169.5	18.9	124.3	91.7	3.6
Surveying and mapping technicians	77.0	0.6	(NA)	0.1	0.8	53.0	11.7	4.3
Life, physical, and social science occupations	1,460.8	20.1	(NA)	155.6	28.6	376.0	314.5	97.8
Life scientists	279.4	(NA)	(NA)	36.5	0.2	71.9	67.9	9.9
Physical scientists	275.5	9.4	(NA)	43.3	1.2	100.8	76.3	6.3
Social scientists and related occupations	549.4	0.3	2.6	22.3	26.7	111.0	82.6	78.2
Life, physical, and social science technicians	356.5	10.3	0.6	53.4	0.5	92.4	87.7	3.4

NA Not available. [1] Includes oil and gas extraction. [2] Includes secondary jobs and unpaid private household employment. [3] Includes kinds of engineers not shown separately. [4] Includes health and safety engineers. [5] Includes other drafters, technicians, and mapping technicians.

Source: U.S. Bureau of Labor Statistics, National Employment Matrix, December 2009 (data collected biennially). See also <http://www.bls.gov/emp/empoils.htm>.

Table 812. Employment and Earnings in Science and Engineering (S&E) Occupations by Industry: 2006

[As of May 2006. Industries ordered by Science and Engineering share of total employment]

Industry	2002 NAICS code [1]	Workers employed (number)		S&E workers as percent of all employed	Mean earnings in S&E occupations (dollars)
		All occupations	S&E occupations		
Computer systems design and related services	5415	1,254,320	609,590	48.6	75,040
Software publishers	5112	240,130	116,260	48.4	79,120
Scientific research and development services	5417	586,220	247,310	42.2	81,220
Computer and peripheral equipment manufacturing	3341	199,370	79,040	39.6	90,710
Internet service providers and Web search portals	5181	119,560	46,120	38.6	69,720
Data processing, hosting, and related services	5182	264,320	83,470	31.6	70,460
Internet publishing and broadcasting	5161	33,220	9,810	29.5	69,800
Architectural, engineering, and related services	5413	1,361,280	397,910	29.2	74,570
Communications equipment manufacturing	3342	144,200	39,270	27.2	83,400
Navigational, measuring, electromedical, and control instruments manufacturing	3345	435,510	117,950	27.1	82,190
Aerospace product and parts manufacturing	3364	464,990	114,620	24.6	80,410
Securities and commodity exchanges	5232	8,850	1,930	21.8	74,000
Semiconductor and other electronic component manufacturing	3344	452,060	93,940	20.8	83,490
Pharmaceutical and medicine manufacturing	3254	288,270	55,640	19.3	73,710
Other telecommunications	5179	5,300	980	18.5	73,820

[1] North American Industry Classification System (NAICS), 2002; see text Section 15.

Source: U.S. National Science Foundation, *Science and Engineering Indicators 2008*, January 2008. See also <http://nsf.gov/statistics/seind08/>.

Table 813. Employment, Mean Earnings, and Growth in Science and Engineering (S&E) Occupations: 2004 to 2008

[Minus sign (–) represents a decrease. Based on data derived from Bureau of Labor Statistics' Occupational Employment Survey (OES)]

Occupation	Employment					Mean earnings	
	2004, total	2008, total	Total growth	Total growth (percent)	Average annual growth rate (percent)	2008 annual earnings (dol.)	Average annual growth rate (percent)
All occupations	**128,127,360**	**135,185,230**	**7,057,870**	**5.5**	**1.3**	**42,270**	**3.4**
STEM [1]	7,160,770	7,852,710	691,940	9.7	2.3	74,950	3.6
S&E	5,085,740	5,781,460	695,720	13.7	3.3	76,680	3.5
Engineers	1,487,810	1,626,330	138,520	9.3	2.3	84,120	3.7
Mathematical and computer scientists	2,566,170	2,972,940	406,770	15.9	3.7	74,420	3.4
Life scientists	275,500	319,520	44,020	16.0	3.8	75,130	3.7
Physical scientists	273,360	301,500	28,140	10.3	2.5	76,710	3.8
Social scientists	482,900	561,160	78,260	16.2	3.8	67,980	2.9
Technicians, programmers, and S&E managers	2,075,020	2,071,260	–3,760	–0.2	(Z)	70,170	3.6
S&E related	6,914,070	7,737,490	823,420	11.9	2.9	(NA)	(NA)
Healthcare practitioners and technicians	6,769,900	7,569,040	799,140	11.8	2.8	(NA)	(NA)
Other S&E related	144,170	168,450	24,280	16.8	4.0	(NA)	(NA)
Not STEM or S&E related	114,052,530	119,595,020	5,542,490	4.9	1.2	(NA)	(NA)

NA Not available. Z Less than 0.05. [1] STEM = science, technology, engineering, and mathematics.

Source: National Science Foundation, *Employment in Science and Engineering Occupations Reached 5.8 Million in 2008*, NSF 10-315, 2010. See also <http://www.nsf.gov/statistics/infbrief/nsf10315/>.

Table 814. Research and Development (R&D) Scientists and Engineers—Employment and Cost by Industry: 2005 to 2007

[In thousands (1,104.5 represents 1,104,500). Data are estimates on full-time-equivalent (FTE) basis. Based on the Survey of Industrial Research and Development. The Business R&D and Innovation Survey replaces the Survey of Industrial Research and Development for data available as of December 2010; see <http://www.nsf.gov/statistics/srvyindustry/about/brdis/>]

Industry	NAICS [1] code	Employed scientists and engineers [2] (1,000)			Cost per scientist or engineer, constant (2000) dollars [3, 4] ($1,000)		
		2005	2006	2007	2005	2006	2007
All industries [5]	**(X)**	**1,104.5**	**1,116.6**	**1,133.0**	**192.4**	**201.6**	**211.9**
Chemicals	325	118.3	123.2	134.0	328.5	330.1	356.4
Machinery	333	61.1	62.3	61.9	125.2	141.1	144.4
Electrical equipment, appliances, and components	335	18.7	16.9	15.8	(D)	(D)	(D)
Motor vehicles, trailers, and parts	3361–3363	42.0	42.0	(NA)	(D)	(D)	(D)
Aerospace products and parts	3364	39.7	39.5	40.2	335.4	359.4	380.5
Software publishing	5112	93.4	46.5	(NA)	162.5	174.0	175.4
Architectural, engineering, and related services	5413	35.8	41.2	48.5	129.3	146.4	113.9
Computer systems design and related services	5415	82.4	93.1	88.1	158.5	157.2	160.3
Scientific R&D services	5417	43.7	44.3	50.4	264.0	298.2	308.7

D Withheld to avoid disclosure. NA Not available. X Not applicable. [1] North American Industry Classification System 2002 (NAICS); see text, Section 15. [2] The mean number of full-time equivalent (R&D) scientists and engineers employed in January of the year shown and the following January. [3] Based on gross domestic product implicit price deflator. [4] 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. [5] Includes other industries not shown separately.

Source: National Science Foundation, *Research and Development in Industry*, NSF 10-319, 2010, and unpublished data. See also <http://www.nsf.gov/statistics/industry/>.

Table 815. Federal Outlays for General Science, Space, and Other Technology, 1970 to 2009, and Projections, 2010 and 2011

[In billions of dollars (4.5 represents $4,500,000,000). For fiscal years ending in year shown; see text, Section 8]

Year	Current dollars			Constant (2005) 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	23.5	4.9	18.5
1980	5.8	1.4	4.5	14.6	3.5	11.2
1985	8.6	2.0	6.6	16.7	3.9	12.8
1990	14.4	2.8	11.6	24.5	4.8	19.7
1995 [1]	16.7	4.1	12.6	22.0	5.4	16.6
2000	18.6	6.2	12.4	22.1	7.3	14.7
2001	19.7	6.5	13.2	22.7	7.5	15.2
2002	20.7	7.2	13.5	23.1	8.1	15.1
2003	20.8	7.9	12.9	22.6	8.6	14.0
2004	23.0	8.3	14.6	23.9	8.7	15.2
2005	23.6	8.8	14.8	23.6	8.8	14.8
2006	23.5	9.0	14.5	22.7	8.7	14.0
2007	25.5	10.2	15.3	23.9	9.6	14.3
2008	27.7	10.5	17.2	25.3	9.6	15.7
2009	29.4	11.0	18.4	26.3	9.8	16.5
2010, proj.	32.8	14.3	18.6	29.4	12.8	16.6
2011, proj.	31.4	14.4	17.1	27.8	12.7	15.1

[1] Due to the effects of the Credit Reform Act of 1990 on the measurement and classification of federal credit activities, the discretionary outlays for years prior to 1995 are not strictly comparable to those for 1995 and after. However, the discretionary outlays shown for 1995 are no more than $1 billion higher than they would have been if measured on the same (pre-credit reform) basis as the 1990 outlays.

Source: U.S. Office of Management and Budget, *Budget of the United States Government: Historical Tables, Fiscal Year 2011*, annual. See also <http://www.gpoaccess.gov/usbudget/fy11/hist.html>.

Table 816. Worldwide Space Launch Events: 2000 to 2009

[In millions of dollars (2,729 represents $2,729,000,000)]

Country	Non-commercial launches				Commercial launches				Launch revenues for commercial launch events (mil. dol.)			
	2000	2005	2008	2009	2000	2005	2008	2009	2000	2005	2008	2009
Total	**50**	**37**	**41**	**54**	**35**	**18**	**28**	**24**	**2,729**	**1,190**	**1,971**	**2,410**
United States	21	11	9	20	7	1	6	4	370	70	215	298
Russia	23	18	15	19	13	8	11	10	671	350	700	742
Europe	–	–	1	2	12	5	5	5	1,433	490	581	1,020
China [1]	5	5	11	5	–	–	–	1	(X)	(X)	(X)	70
India	–	1	3	2	–	–	–	–	(X)	(X)	(X)	(X)
Japan	1	2	1	3	–	–	–	–	(X)	(X)	(X)	(X)
Iran	–	–	1	1	–	–	–	–	(X)	(X)	(X)	(X)
Korea, North	–	–	–	1	–	–	–	–	(X)	(X)	(X)	(X)
Korea, South	–	–	–	1	–	–	–	–	(X)	(X)	(X)	(X)
Multinational	–	–	–	–	3	4	6	4	255	280	475	280

– Represents zero. X Not applicable. [1] See footnote 4, Table 1331.

Source: Federal Aviation Administration, *Commercial Space Transportation: 2009 Year in Review*, January 2010, and prior years. See also <http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/year_review>.

Table 817. U.S. and Worldwide Commercial Space Industry Revenue by Type: 2000 to 2008

[In billions of dollars (19.3 represents $19,300,000,000). For calendar years]

Industry	United States				World			
	2000	2005	2007	2008	2000	2005	2007	2008
Revenue, total	**19.3**	**30.8**	**(NA)**	**(NA)**	**64.2**	**88.8**	**121.7**	**144.4**
Satellite manufacturing [1]	6.0	3.2	4.8	3.1	11.5	7.8	11.6	10.5
Launch industry	2.7	1.5	1.0	1.1	5.3	3.0	3.2	3.9
Satellite services [2]	10.6	26.1	(NA)	(NA)	28.9	52.8	72.6	84.0
Ground equipment manufacturing [3]	(NA)	(NA)	(NA)	(NA)	18.5	25.2	34.3	46.0

NA Not available. [1] Includes revenues from the construction and sale of satellites to both commercial and government. [2] Includes revenues derived from transponder leasing and subscription/retail services such as direct-to-home television, satellite radio, remote sensing, and satellite mobile and data communications. [3] Includes revenues from the manufacture of gateways and satellite control stations, satellite news-gathering trucks, very small aperture terminals, direct-to-home television equipment and mobile satellite phones.

Source: Satellite Industry Association/Futron Corporation, *State of the Satellite Industry Report*, June 2009 (copyright). See also <http://sia.org/IndustryReport.htm>.