

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. 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 detailed statistical tables; info briefs; and annual, biennial, and special reports <<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* <<http://www.nsf.gov/statistics/seind08/>> 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 775. Research and Development (R&D) Expenditures by Source and Objective: 1980 to 2007

[In millions of dollars (63,225 represents \$63,225,000,000), except as indicated]

Year	Total	Sources of funds					Objective (percent of total)			Character of work		
		Federal government	Industry	Universities/colleges	Non-profit	Non-federal government ¹	Defense related ²	Space related ³	Other	Basic research	Applied research	Development
1980	63,225	29,986	30,929	920	871	519	24	5	70	8,745	13,714	40,765
1981	72,293	33,739	35,948	1,058	967	581	24	5	70	9,658	16,329	46,305
1982	80,748	37,133	40,692	1,207	1,095	621	26	5	69	10,651	18,218	51,879
1983	89,950	41,451	45,264	1,357	1,220	658	28	4	68	11,880	20,298	57,771
1984	102,243	46,470	52,187	1,514	1,351	721	29	3	68	13,332	22,451	66,461
1985	114,671	52,641	57,962	1,743	1,491	834	30	3	67	14,748	25,401	74,522
1986	120,248	54,622	60,991	2,019	1,647	969	31	3	66	17,154	27,240	75,855
1987	126,361	58,609	62,576	2,262	1,849	1,065	32	3	65	18,481	27,951	79,929
1988	133,880	60,130	67,977	2,527	2,081	1,165	30	4	66	19,786	29,528	84,566
1989	141,889	60,464	74,966	2,852	2,333	1,274	28	4	69	21,889	32,277	87,723
1990	151,990	61,607	83,208	3,187	2,589	1,399	25	4	71	23,028	34,896	94,067
1991	160,872	60,780	92,300	3,457	2,852	1,483	22	5	73	27,139	38,629	95,104
1992	165,347	60,912	96,229	3,568	3,113	1,525	22	4	74	27,604	37,933	99,810
1993	165,727	60,524	96,549	3,709	3,388	1,557	21	4	74	28,743	37,280	99,704
1994	169,202	60,773	99,203	3,938	3,665	1,623	20	5	76	29,651	36,615	102,936
1995	183,620	62,964	110,870	4,110	3,925	1,751	19	5	77	29,610	40,933	113,077
1996	197,340	63,389	123,416	4,435	4,239	1,861	18	4	78	32,799	43,165	121,375
1997	212,144	64,568	136,227	4,837	4,590	1,922	17	4	79	36,917	46,551	128,676
1998	226,457	66,376	147,845	5,162	5,102	1,972	16	4	80	35,333	46,388	144,735
1999	245,041	67,046	164,660	5,618	5,619	2,098	15	3	82	38,875	52,097	154,069
2000	267,562	66,406	186,136	6,231	6,542	2,247	13	2	84	42,767	56,932	167,863
2001	277,746	72,826	188,440	6,826	7,257	2,397	14	2	84	47,792	64,708	165,245
2002	276,602	77,699	180,711	7,343	8,292	2,557	15	2	82	51,410	51,035	174,157
2003	289,039	83,606	186,174	7,649	8,868	2,742	16	2	82	54,839	61,690	172,509
2004	299,905	88,749	191,377	7,933	8,962	2,884	17	2	81	56,378	70,172	173,354
2005	323,005	93,734	207,841	8,575	9,905	2,950	17	2	81	60,003	70,355	192,647
2006	347,872	97,701	227,276	9,282	10,542	3,071	17	2	81	61,721	76,788	209,362
2007 ⁴	368,097	98,331	245,027	9,866	11,647	3,226	16	2	82	64,417	81,211	222,470

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, NSF 08-318, *National Patterns of R&D Resources*, November 2008, annual. See also <<http://www.nsf.gov/statistics/nsf083181/>>.

Table 776. National Research and Development (R&D) Expenditures as a Percent of Gross Domestic Product by Country: 1990 to 2007

Year	United States	Japan ¹	Germany ²	France	United Kingdom	Italy	Canada	Russia	Total OECD ³
1990	2.65	2.81	2.61	2.32	2.14	1.25	1.51	2.03	2.25
1995	2.51	2.71	2.19	2.29	1.94	0.97	1.70	0.85	2.06
2000	2.75	3.04	2.45	2.15	1.85	1.05	1.91	1.05	2.21
2002	2.66	3.17	2.49	2.23	1.82	1.13	2.04	1.25	2.22
2003	2.66	3.20	2.52	2.17	1.78	1.11	2.03	1.28	2.22
2004	2.59	3.17	2.49	2.15	1.71	1.10	2.05	1.15	2.19
2005	2.62	3.32	2.48	2.10	1.76	1.09	2.01	1.07	2.23
2006	2.66	3.39	2.54	2.10	1.78	1.14	1.94	1.07	2.26
2007	2.68	(NA)	2.53	2.08	(NA)	(NA)	1.89	1.12	(NA)

NA Not available. ¹ Data on Japanese research and development in 1996 and later years 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.

Source: Organization for Economic Cooperation and Development, Paris, France, *Main Science and Technology Indicators*, 2008/2nd edition (copyright); <<http://www.oecd.org/>>.

Table 777. Performance Sector of Research and Development (R&D) Expenditures: 2000 to 2007

[In millions of dollars (267,562 represents \$267,562,000,000). FFRDCs are federally funded research and development centers]

Year	Total	Federal government	Industry			Industry FFRDCs	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	Non-federal government ²	Industry	Universities & colleges	Non-profits			Federal government	Industry	Non-profits
RESEARCH AND DEVELOPMENT TOTAL																	
2000	267,562	17,917	199,961	17,117	182,844	2,001	30,693	17,717	2,247	2,174	6,231	2,325	5,742	9,782	4,447	1,118	4,217
2003	289,038	22,752	200,724	17,798	182,926	2,458	40,470	25,116	2,742	2,129	7,649	2,833	7,301	12,839	5,686	1,118	6,035
2004	299,905	22,844	208,301	20,266	188,035	2,485	43,111	27,157	2,884	2,191	7,933	2,946	7,658	12,862	5,695	1,151	6,016
2005	323,005	24,459	226,159	21,909	204,250	2,601	45,191	28,203	2,950	2,338	8,575	3,126	7,812	13,954	5,922	1,253	6,779
2006	347,872	25,327	247,669	24,304	223,365	2,562	46,987	28,784	3,071	2,536	9,282	3,314	7,866	14,507	5,905	1,374	7,228
2007 ⁴	368,097	24,744	265,193	24,450	240,743	2,539	48,913	29,468	3,226	2,799	9,866	3,553	8,126	15,346	5,767	1,485	8,094
BASIC RESEARCH																	
2000	42,767	3,765	7,040	925	6,115	547	22,864	13,915	1,549	1,499	4,297	1,603	2,874	5,062	2,099	621	2,341
2003	54,839	4,664	8,330	1,386	6,944	299	30,084	19,600	1,872	1,454	5,223	1,935	3,747	6,686	2,714	621	3,351
2004	56,378	4,697	7,835	1,072	6,763	175	32,105	21,143	1,981	1,506	5,450	2,024	3,729	6,768	2,788	639	3,341
2005	60,003	4,826	8,667	1,108	7,559	136	34,009	22,159	2,057	1,631	5,982	2,180	3,814	7,370	2,910	696	3,764
2006	61,721	4,952	8,384	1,444	6,940	131	35,413	22,661	2,151	1,777	6,502	2,322	3,907	7,680	2,904	763	4,013
2007 ⁴	64,417	4,869	8,933	1,453	7,480	130	36,801	23,199	2,257	1,958	6,901	2,485	4,047	8,260	2,941	824	4,494
APPLIED RESEARCH																	
2000	56,932	6,105	39,176	2,682	36,494	269	6,653	3,350	572	553	1,586	592	1,329	3,183	1,831	283	1,069
2003	61,690	7,672	37,334	4,473	32,861	1,434	8,832	4,838	713	554	1,989	737	1,756	4,300	2,487	283	1,529
2004	70,172	7,455	45,432	4,775	40,657	1,509	9,230	5,136	740	562	2,035	756	1,920	4,264	2,448	292	1,525
2005	70,355	7,594	45,284	5,289	39,995	1,487	9,284	5,070	732	580	2,126	775	1,858	4,439	2,403	318	1,718
2006	76,788	7,692	51,173	6,140	45,033	1,446	9,623	5,153	754	623	2,279	814	1,779	4,635	2,455	348	1,832
2007 ⁴	81,211	7,839	54,713	6,177	48,537	1,414	10,102	5,310	795	690	2,431	875	1,844	4,844	2,417	376	2,051
DEVELOPMENT																	
2000	167,863	8,047	153,745	13,510	140,235	1,185	1,177	452	126	121	348	130	1,539	1,537	517	214	807
2003	172,509	10,416	155,060	11,939	143,121	725	1,555	678	157	122	437	162	1,798	1,853	485	214	1,155
2004	173,354	10,692	155,034	14,419	140,615	801	1,776	878	163	123	447	166	2,008	1,830	459	220	1,151
2005	192,647	12,039	172,208	15,512	156,696	979	1,899	974	161	127	467	170	2,140	2,145	609	240	1,297
2006	209,362	12,682	188,112	16,720	171,392	985	1,951	970	166	137	500	179	2,180	2,192	546	263	1,383
2007 ⁴	222,470	12,037	201,547	16,820	184,726	995	2,010	958	175	151	534	192	2,236	2,242	409	284	1,549

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/>>.

Table 778. Federal Obligations for Research in Current and Constant (2000) Dollars by Field of Science: 2005 to 2008

[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	2006	2007, prel.	2008, prel.	2005	2006	2007, prel.	2008, prel.
Research, total	53,738	53,536	55,075	54,709	48,032	47,658	45,966	44,689
Basic	27,140	26,585	27,477	27,721	24,258	24,001	22,932	22,644
Applied.	26,598	26,951	27,598	26,988	23,774	23,657	23,034	22,045
Life sciences	28,543	27,928	27,814	27,533	25,327	23,987	23,214	22,490
Psychology	1,916	1,747	1,757	1,758	1,700	1,501	1,466	1,436
Physical sciences.	5,473	5,351	5,468	5,607	4,857	4,596	4,564	4,580
Environmental sciences.	3,876	3,431	3,343	3,408	3,439	2,946	2,790	2,784
Mathematics and computer sciences . .	3,115	2,815	3,194	3,129	2,764	2,418	2,665	2,556
Engineering.	9,481	8,679	9,426	9,258	8,412	7,454	7,867	7,563
Social sciences	1,132	1,124	1,141	1,146	1,004	965	952	936
Other sciences, n.e.c. ²	2,010	2,461	2,932	2,869	1,784	2,114	2,447	2,343

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

Source: U.S. National Science Foundation, NSF 09-300 *Federal Funds for Research and Development*, November 2008, annual. See also <<http://www.nsf.gov/statistics/nsf09300/>>.

Table 779. Federal Budget Authority for Research and Development (R&D) in Current and Constant (2000) Dollars by Selected Budget Functions: 2005 to 2008

[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	2006	2007	2008, prel.	2005	2006	2007	2008, prel.
Total ²	126,601	131,624	138,087	137,972	112,003	112,812	115,248	112,702
National defense	74,047	78,037	82,272	81,050	65,509	66,884	68,665	66,205
Health	28,824	28,797	29,461	29,634	25,500	24,681	24,588	24,206
Space research and technology	7,300	8,204	9,024	9,233	6,458	7,031	7,531	7,542
Energy	1,296	1,195	1,893	2,374	1,147	1,024	1,580	1,939
General science	6,570	6,691	7,809	7,915	5,812	5,735	6,517	6,465
Natural resources and environment	2,168	2,120	1,936	2,008	1,918	1,817	1,616	1,640
Transportation	1,847	1,711	1,361	1,340	1,634	1,466	1,136	1,095
Agriculture	1,820	1,869	1,857	1,852	1,610	1,602	1,550	1,513

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

Source: U.S. National Science Foundation, NSF 08-315 *Federal R&D Funding by Budget Function*, annual. See also <<http://www.nsf.gov/statistics/nsf083151/>>.

Table 780. Federal Research and Development (R&D) by Federal Agency: 2007 and 2008

[In millions of dollars (141,933 represents \$144,933,000,000). 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 plant) 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	2007	2008, est.	Federal agency	2007	2008, est.
Total research and development . .	141,933	144,354	National Institute of Standards and Technology	487	521
Defense R&D.	82,658	83,065	Department of Interior	647	676
Nondefense R&D	59,276	61,288	U.S. Geological Survey.	574	586
Department of Defense	79,009	79,347	Department of Transportation	767	820
Science and technology	13,518	13,456	Environmental Protection Agency.	557	548
All other Department of Defense R&D .	65,490	65,891	Department of Veterans Affairs	819	891
Health and Human Services	29,621	29,966	Department of Education	327	321
National Institute of Health	28,350	28,826	Department of Homeland Security	996	992
All other Health and Human Services R&D	1,271	1,140	International Assistance Programs	246	223
NASA.	11,582	12,251	Smithsonian.	186	203
Department of Energy	9,035	9,724	Tennessee Valley Authority.	20	20
Atomic Energy Defense	3,649	3,718	Department of Labor	24	57
Office of Science	3,560	3,637	Nuclear Regulatory Commission	76	71
Energy R&D	1,826	2,369	Army Corps of Engineers	11	11
National Science Foundation	4,440	4,501	Department of Housing and Urban Development	49	51
Department of Agriculture.	2,275	2,359	Department of Justice	104	81
Department of Commerce	1,073	1,138	Social Security Administration	27	27
National Oceanic and Atmospheric Administration	557	581	U.S. Postal Service.	43	43

Source: American Association for the Advancement of Science (AAAS), *AAAS Report XXXIII Research and Development FY 2009*, annual. See also <<http://www.aaas.org/spp/rd/rd09main.htm>>.

Table 781. 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 <<http://www.nsf.gov/statistics/>>.

Table 782. 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 funds²	(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) DOLLARS³					
Total funds²	(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 North American Industry Classification System, 1997; 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 <<http://www.nsf.gov/statistics/>>.

Table 783. Academic and Industrial Research and Development (R&D) Performed by State: 2006

[In millions of dollars (46,917 represents 46,917,000,000). For definition of research and development (R&D), see text in this section]

State	Academic R&D (mil. dol.)	Academic R&D per \$1,000 of GDP	Industry-performed R&D (mil. dol.)	Industry-performed R&D per private-industry output (percent) ¹	State	Academic R&D (mil. dol.)	Academic R&D per \$1,000 of GDP	Industry-performed R&D (mil. dol.)	Industry-performed R&D per private-industry output (percent) ¹
U.S. ²	46,917	3.56	247,669	1.88	MT.	173	5.40	⁴ 103	⁴ 0.32
AL.	602	3.80	1,835	1.16	NE.	359	4.77	447	0.59
AK.	163	3.78	49	³ 0.11	NV.	194	1.58	535	0.43
AZ.	765	3.22	3,590	1.51	NH.	315	5.62	⁴ 1,774	⁴ 3.16
AR.	237	2.61	285	0.31	NJ.	858	1.91	14,606	3.26
CA.	6,493	3.73	58,424	3.35	NM.	425	5.90	676	0.94
CO.	821	3.63	4,657	2.06	NY.	3,790	3.69	9,518	0.93
CT.	693	3.38	8,273	4.04	NC.	1,710	4.49	5,486	1.44
DE.	122	2.05	1,446	2.43	NC.	160	6.19	120	0.46
DC.	296	3.36	276	0.31	OH.	1,636	3.62	6,852	1.52
FL.	1,528	2.13	4,139	0.58	OK.	298	2.29	474	0.36
GA.	1,303	3.46	2,786	0.74	OR.	557	3.69	3,419	2.26
HI.	257	4.39	155	0.26	PA.	2,428	4.77	9,819	1.93
ID.	111	2.30	625	1.29	RI.	230	5.03	⁴ 1,330	⁴ 2.91
IL.	1,824	3.12	10,765	1.84	SC.	524	3.58	1,396	0.95
IN.	823	3.45	4,858	2.04	SD.	73	3.27	95	0.30
IA.	573	4.70	1,055	0.87	TN.	743	2.15	1,428	0.61
KS.	354	3.20	⁴ 2,064	⁴ 1.87	TX.	3,271	3.06	13,334	1.25
KY.	479	3.27	839	0.57	UT.	413	4.21	1,274	1.30
LA.	539	2.65	367	0.18	VT.	122	5.16	360	1.52
ME.	120	2.59	253	0.55	VA.	947	2.57	4,816	1.31
MD.	⁵ 1,821	⁵ 7.07	3,421	1.33	WA.	988	3.39	11,320	3.89
MA.	2,159	6.44	15,562	4.64	WV.	149	2.65	221	0.39
MI.	1,473	3.92	16,477	4.38	WI.	1,040	4.65	3,020	1.35
MN.	605	2.50	6,296	2.60	WY.	89	2.99	⁴ 27	⁴ 0.09
MS.	369	4.36	231	0.27					
MO.	900	4.09	2,675	1.22					

¹ Gross Domestic Product (GDP) by state for private industries. ² National totals for calendar year 2006. The industrial totals include \$3.8 billion of R&D expenditures in 2006 that could not be allocated to specific states. The academic totals incorporate adjustments to convert fiscal year academic data to calendar year and to eliminate double counting of funds passed through one academic institution to another. ³ More than 50 percent of industrial R&D value imputed because of raking of state data. ⁴ More than 50 percent of industrial R&D value imputed. ⁵ For Maryland, academic R&D excludes R&D performed by the Applied Physics Laboratory (APL) at the Johns Hopkins University. APL performed \$709 million of R&D in 2006.

Table 784. Research and Development (R&D) Expenditures in Science and Engineering at Universities and Colleges in Current and Constant (2000) Dollars: 2000 to 2007

[In millions of dollars (30,073 represents \$30,073,000,000)]

Characteristic	Current dollars				Constant (2000) dollars ¹			
	2000	2005	2006	2007	2000	2005	2006	2007
Total	30,073	45,793	47,743	49,431	30,073	40,513	40,921	41,255
Basic research ²	22,456	34,358	36,063	37,609	22,456	30,396	30,910	31,389
Applied R&D ²	7,617	11,434	11,680	11,822	7,617	10,116	10,011	9,867
Source of funds:								
Federal government	17,538	29,203	30,124	30,441	17,538	25,836	25,820	25,406
State and local government	2,200	2,942	2,963	3,145	2,200	2,603	2,540	2,625
Institutions' own funds	5,924	8,261	9,057	9,655	5,924	7,308	7,763	8,058
Industry	2,156	2,294	2,404	2,672	2,156	2,029	2,061	2,230
Other	2,254	3,093	3,196	3,517	2,254	2,736	2,739	2,935
Fields:								
Physical sciences	2,712	3,702	3,812	3,842	2,712	3,275	3,267	3,207
Environmental sciences	1,765	2,554	2,601	2,725	1,765	2,259	2,229	2,274
Mathematical sciences	342	495	533	572	342	438	457	477
Computer sciences	876	1,406	1,438	1,417	876	1,244	1,233	1,183
Life sciences	17,471	27,603	28,802	29,764	17,471	24,420	24,687	24,841
Psychology	517	826	875	863	517	731	750	720
Social sciences	1,299	1,685	1,702	1,781	1,299	1,491	1,459	1,486
Other sciences	535	778	888	949	535	688	761	792
Engineering	4,555	6,745	7,092	7,517	4,555	5,967	6,079	6,274

¹ Based on gross domestic product implicit price deflator. ² Basic research and applied R&D statistics were reestimated for FY 2001 and forward. These data are not directly comparable to those from earlier years.

Source: U.S. National Science Foundation, NSF-09-303, *Survey of Research and Development Expenditures at Universities and Colleges*, annual. See also <<http://www.nsf.gov/statistics/srvyrdexpenditures/>>.

Table 785. Federal Research and Development (R&D) Obligations to Selected Universities and Colleges: 2006 and 2007

[In millions of dollars (25,361.0 represents \$25,361,000,000). 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	25,361.6	25,419.4	University of Colorado	340.3	330.3
Johns Hopkins University	1,251.5	1,186.8	Cornell University	299.3	326.4
University of Washington	615.6	612.5	Case Western Reserve University	277.9	278.9
University of Michigan	516.4	501.8	University Southern California	266.5	262.2
University of Pennsylvania	497.7	498.5	University of Rochester	252.3	255.2
University of California—Los Angeles	478.7	480.7	Northwestern University	222.6	255.0
Duke University	472.7	470.8	University of Chicago	219.8	248.6
University of California—San Diego	401.8	433.8	Emory University	228.1	247.9
University of California—San Francisco	441.9	433.4	University of California—Davis	236.4	243.1
Harvard University	420.8	429.7	University of Alabama—Birmingham	235.4	235.1
University of Pittsburgh	426.9	426.8	Baylor College of Medicine	236.5	227.9
Columbia University—City of NY	467.8	426.4	Ohio State University	206.7	217.6
Stanford University	458.3	425.9	University of California—Berkeley	228.8	214.5
Washington University	410.7	407.8	University of Arizona	201.5	212.5
Yale University	361.9	387.3	University of Illinois—Urbana Champaign	185.6	210.5
Massachusetts Institute of Technology	406.5	381.8	Boston University	204.7	208.7
University of Minnesota	331.6	371.3	University of Iowa	193.0	208.4
University of Wisconsin—Madison	373.8	369.3	The Scripps Research Institute	217.5	199.0
Pennsylvania State University	302.6	355.3	University of Virginia	176.4	199.0
University of North Carolina at Chapel Hill	343.4	353.5	Oregon Health & Science University	193.6	189.7
Vanderbilt University	306.4	331.2	Mt. Sinai School of Medicine	177.0	187.3

¹ Includes other institutions, not shown separately.

Table 786. Graduate Science/Engineering Students in Doctorate-Granting Colleges by Characteristic and Field: 1990 to 2006

[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	2006	1990	2000	2006	2000	2006	1990	2000	2006	
Total, all surveyed fields . . .	409.4	443.5	542.1	155.5	201.8	263.6	123.3	144.5	130.8	123.6	148.9	
Science/engineering	360.6	374.8	445.0	117.9	150.3	188.9	118.0	136.6	107.5	99.3	113.7	
Engineering, total	101.0	98.8	116.6	13.8	19.7	26.3	46.3	52.9	36.7	28.2	31.5	
Sciences, total	259.6	275.9	328.4	104.2	130.7	162.6	71.7	83.7	70.8	71.1	82.2	
Physical sciences	32.9	29.6	35.9	7.7	8.8	11.6	11.5	14.5	3.9	3.5	3.6	
Environmental	13.1	13.0	14.0	3.8	5.3	6.5	2.6	2.7	3.2	2.8	2.9	
Mathematical sciences	18.1	14.4	19.0	5.6	5.2	6.8	5.9	7.4	4.7	3.0	4.0	
Computer sciences	29.2	40.3	43.0	6.8	11.7	10.8	19.7	19.1	14.1	16.7	16.1	
Agricultural sciences	11.0	11.3	12.1	3.2	4.8	5.8	2.4	2.6	2.0	2.4	3.2	
Biological sciences	46.7	53.1	65.9	21.4	27.8	36.9	11.6	16.6	7.2	7.6	8.8	
Psychology	38.5	40.3	47.2	25.5	29.0	35.5	2.1	2.6	12.0	10.8	14.3	
Social sciences	70.0	73.9	91.2	30.1	38.1	48.6	15.8	18.1	23.8	24.3	29.3	
Health fields, total	48.8	68.8	97.0	37.6	51.5	74.7	5.4	7.9	23.3	24.3	35.3	

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

Table 787. 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 792]

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, NSF 09-311, *Science and Engineering Doctorate Awards*, March 2009, annual. See also <<http://www.nsf.gov/statistics/nsf09311/>>.

Table 788. Science and Engineering (S&E) Degrees Awarded by Degree Level and Sex of Recipient: 1990 to 2007

[For a description of science and engineering degree categories, see Appendix B of source <<http://www.nsf.gov/statistics/nsf07307/content.cfm?pubid=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
2004	485,488	239,580	245,908	50.7	119,090	66,555	52,535	44.1	26,272	16,418	9,854	37.5
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

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

Table 789. Doctorates Conferred by Characteristics of Recipients: 2000 and 2007

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

Characteristic	2000, total [†]	2007									
		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	48,079	7,745	4,106	876	1,393	1,662	7,173	1,137	4,415	3,294
Male	56.0	54.4	79.2	71.1	61.8	70.9	79.8	51.2	59.6	52.2	28.7
Female	43.8	45.5	20.7	28.8	38.1	28.9	20.0	48.7	40.1	47.7	71.3
CITIZENSHIP ⁵											
Total conferred (number)	39,596	44,515	7,111	3,812	834	1,299	1,543	6,797	1,059	4,086	3,026
U.S. citizen	70.7	61.9	31.5	49.3	62.5	41.9	35.1	65.9	56.2	61.0	89.9
Foreign citizen	29.3	38.1	68.5	50.7	37.5	58.1	64.9	34.1	43.8	39.0	10.1
RACE/ETHNICITY ⁶											
Total conferred (number)	29,936	29,400	2,532	2,027	550	605	644	4,781	625	2,690	2,790
White ⁷	79.2	75.9	71.1	77.6	84.9	77.7	71.9	75.6	85.9	75.8	76.8
Black ⁷	5.8	6.6	3.6	4.1	1.6	3.1	4.8	3.9	2.7	7.0	5.8
Asian/Pacific ⁷	7.6	7.9	15.6	9.4	2.0	11.6	16.5	11.7	3.5	6.7	5.5
Indian/Alaskan ⁷	0.6	0.5	0.3	0.3	0.0	0.3	0.2	0.3	1.3	0.7	0.8
Hispanic	4.4	5.6	5.0	4.7	3.6	3.8	2.8	5.4	3.8	5.9	7.3
Other/unknown ⁸	2.4	3.5	4.4	3.9	4.2	3.5	3.9	3.2	2.7	3.9	3.6

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 For those with known citizenship. Includes those with temporary visas. ⁶ Excludes those with temporary visas. ⁷ Non-Hispanic. ⁸ 2007 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, NSF-09-307, *Science and Engineering Doctorate Awards*, annual. See also <<http://www.nsf.gov/statistics/nsf07305/>>.

Table 790. Science and Engineering (S&E) Doctorates by State: 2006

[Data on U.S. S&E doctorate holders classified by the state where the doctorate holder resides, if known; otherwise data are classified by employer's location. Population of doctorate holders consisted of all individuals under age 76 years of age who received a research doctorate in S&E from a U.S. institution and were residing in the United States. Excludes medical doctorates]

State	S&E doctorates conferred ¹	S&E doctorate holders ¹	Doctorate holders per capita ¹	State	S&E doctorates conferred ¹	S&E doctorate holders ¹	Doctorate holders per capita ¹	State	S&E doctorates conferred ¹	S&E doctorate holders ¹	Doctorate holders per capita ¹
US. . .	29,777	708,080	2.4	KS	268	4,830	1.8				
AL	338	7,090	1.5	KY	255	5,760	1.4	ND ² . . .	51	1,550	2.4
AK ² . . .	21	1,330	2.0	LA	303	6,290	1.5	OH	1,197	23,630	2.1
AZ	507	10,050	1.6	ME ² . . .	27	2,930	2.2	OK	220	5,290	1.5
AR	107	3,250	1.2	MD	840	29,870	5.3	OR	317	10,900	3.0
CA	4,005	99,110	2.7	MA	1,724	35,440	5.5	PA	1,472	32,780	2.6
CO	477	16,080	3.4	MI	1,066	19,790	2.0	RI	222	3,290	3.1
CT	443	11,830	3.4	MN	533	13,220	2.6	SC	238	6,920	1.6
DE	146	3,880	4.6	MS	169	3,910	1.3	SD ² . . .	36	1,220	1.5
DC	338	13,750	23.5	MO	503	10,340	1.8	TN	395	11,380	1.9
FL	1,082	22,020	1.2	MT	65	2,480	2.6	TX	1,930	41,420	1.8
GA	791	14,890	1.6	NE	149	3,320	1.9	UT	238	6,730	2.6
HI	91	3,230	2.5	NV	99	2,940	1.2	VT ² . . .	49	2,070	3.3
ID	67	3,190	2.2	NH	96	2,760	2.1	VA	727	22,800	3.0
IL	1,466	26,800	2.1	NJ	670	23,610	2.7	WA	544	19,900	3.1
IN	762	11,380	1.8	NM	193	9,960	5.1	WV ² . . .	117	2,510	1.4
IA	402	5,740	1.9	NY	2,530	50,760	2.6	WI	577	11,200	2.0
				NC	876	21,670	2.4	WY ² . . .	38	990	1.9

¹ Estimates for S&E doctorate holders may vary between 10 percent and 25 percent because geography is not part of sample design. ² Data for 2006 S&E doctorate holders are preliminary.

Source: National Science Foundation, *Science and Engineering Indicators, 2008*, January 2008, biennial.

Table 791. 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:			
Age:				Bachelor's	13,228	6,223	7,005
29 or younger	2,732	1,542	1,190	Master's	6,411	3,039	3,373
30-39 years	5,302	2,596	2,705	Doctorate	1,018	308	710
40-49 years	5,849	2,699	3,150	Professional	1,973	660	1,312
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
Race/ethnicity:				Non-U.S. citizen, permanent resident	835	330	505
American Indian/Alaska Native . .	102	51	50	Non-U.S. citizen, temporary resident	291	95	196
Asian	2,255	994	1,261	Marital status:			
Black	1,258	738	520	Married	16,100	6,655	9,445
Native Hawaiian/Other Pacific Islander	85	33	53	Living in marriage-like relationship	892	482	410
White	17,420	7,670	9,751	Widowed	356	245	111
Multiple race	316	156	159	Separated	243	131	111
Hispanic, any race	1,193	588	605	Divorced	1,518	887	631
Children in the home?				Never married	3,521	1,829	1,692
Yes	10,966	5,015	5,951				
No	11,664	5,215	6,449				

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

Table 792. Doctorates Awarded by Field of Study and Year of Doctorate: 2000 to 2007

Field of study	2000	2002	2003	2004	2005	2006	2007
Total, all fields	41,365	40,024	40,757	42,117	43,378	45,598	48,079
Science and engineering, total	25,971	24,608	25,282	26,273	27,984	29,855	31,801
Engineering, total	5,323	5,081	5,281	5,777	6,427	7,183	7,745
Aeronautical/astronautical	214	209	200	201	219	238	267
Chemical	726	705	648	726	875	891	921
Civil	556	630	674	673	758	803	865
Electrical	1,544	1,393	1,466	1,651	1,851	2,132	2,408
Industrial/manufacturing	176	230	214	217	221	234	280
Materials/metallurgical	451	396	475	510	540	625	679
Mechanical	864	827	814	852	978	1,146	1,129
Other	792	691	790	947	985	1,114	1,196
Science, total	20,648	19,527	20,001	20,496	21,557	22,672	24,056
Biological/agricultural sciences	6,895	6,704	6,757	6,987	7,404	7,674	8,310
Agricultural sciences	1,042	1,010	1,061	1,045	1,038	1,033	1,137
Biological sciences	5,853	5,694	5,696	5,942	6,366	6,641	7,173
Earth, atmospheric, and ocean sciences, total	694	689	683	686	714	757	876
Atmospheric	143	117	139	126	145	147	167
Earth	387	426	374	420	420	469	522
Ocean sciences	164	146	170	140	149	141	187
Mathematical/computer sciences, total	1,911	1,728	1,860	2,024	2,334	2,778	3,055
Computer sciences	861	809	867	948	1,129	1,453	1,662
Mathematics	1,050	919	993	1,076	1,205	1,325	1,393
Physical sciences, total	3,378	3,187	3,287	3,335	3,643	3,929	4,106
Astronomy	185	141	167	165	186	197	224
Chemistry	1,989	1,923	2,040	1,986	2,126	2,363	2,328
Physics	1,204	1,123	1,080	1,184	1,331	1,369	1,554
Psychology	3,615	3,206	3,275	3,325	3,321	3,258	3,294
Social sciences, total	4,155	4,013	4,139	4,139	4,141	4,276	4,415
Economics	1,086	1,027	1,050	1,069	1,183	1,142	1,179
Political science	986	939	1,025	946	990	998	1,256
Sociology	637	567	612	599	556	602	591
Other social sciences	1,446	1,481	1,452	1,524	1,412	1,533	1,389
Nonscience and engineering, total	15,394	15,416	15,475	15,844	15,394	15,743	16,278
Education	6,436	6,503	6,643	6,633	6,224	6,120	6,429
Health	1,591	1,655	1,633	1,719	1,784	1,905	2,134
Humanities	5,213	5,050	5,020	5,012	4,950	5,125	4,890
Professional/other/unknown	2,154	2,208	2,179	2,480	2,436	2,593	2,825

Source: U.S. National Science Foundation, NSF 09-311, *Science and Engineering Doctorate Awards*, annual. See also <<http://www.nsf.gov/statistics/nsf07305/>>.

Table 793. Civilian Employment of Scientists, Engineers, and Related Occupations by Occupation and Industry: 2006

[In thousands (263.7 represents 263,700). Standard Occupational Classification (SOC) system categorizes workers in 1 of 801 detailed occupations. Industry classifications correspond to 2002 North American Industry Classification System (NAICS) industrial groups. For definition of scientists and engineers, see text this section and Table 784]

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	263.7	0.5	0.7	24.7	31.0	65.3	18.1	3.6
Engineering managers	187.1	2.1	5.4	80.9	5.2	55.9	16.5	0.1
Natural science managers	40.7	0.3	(NA)	5.5	0.2	14.6	14.3	0.2
Computer and mathematical scientists	3,313.2	8.4	7.7	268.3	413.2	1,004.6	240.5	130.9
Computer specialists	3,199.6	0.4	7.5	262.4	406.2	978.8	221.5	129.5
Mathematical science occupations	113.6	(NA)	0.2	5.9	7.1	25.7	19.0	1.5
Surveyors, cartographers, and photogrammetrists	72.2	0.8	4.1	(NA)	(NA)	52.2	9.5	2.6
Engineers ³	1,511.5	21.0	40.3	563.7	41.3	430.6	180.0	45.7
Aerospace engineers	89.8	(NA)	(NA)	58.4	(NA)	15.9	9.1	1.3
Civil engineers	256.3	0.5	24.3	2.7	1.1	130.9	69.1	12.5
Computer and hardware engineers	78.5	(NA)	(NA)	33.8	(NA)	23.3	4.5	2.8
Electrical and electronics engineers	291.2	0.2	4.9	103.2	30.6	70.8	26.1	6.3
Industrial engineers ⁴	226.7	2.3	5.9	149.5	3.0	29.2	5.2	2.1
Mechanical engineers	225.8	0.8	2.9	120.6	0.3	63.2	11.9	5.1
Drafters, engineering, and mapping technicians ⁵	839.8	4.9	25.2	240.4	24.2	309.3	107.6	20.9
Engineering technicians	511.0	3.6	4.8	178.0	21.8	126.5	90.7	4.4
Surveying and mapping technicians	75.6	0.6	0.9	0.2	0.4	54.2	11.6	3.2
Life, physical, and social science occupations	1,406.9	18.3	3.6	151.1	30.0	346.1	302.4	97.4
Life scientists	258.5	(NA)	(NA)	31.1	(NA)	60.8	66.9	11.5
Physical scientists	266.8	8.7	0.4	42.4	1.9	98.4	73.9	4.7
Social scientists and related occupations	530.2	(NA)	2.9	24.2	27.4	100.0	75.4	77.7
Life, physical, and social science technicians	351.4	9.2	0.4	53.5	(NA)	86.9	86.2	3.5

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*, February 2008. (Data collected biennially.) For more information see <<http://www.bls.gov/emp/nioem/empioan.htm>>.

Table 794. 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. See headnote, Table 795]

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

Table 795. Individuals Employed in Science and Engineering (S&E) Occupations as Share of Workforce by State and Other Areas: 2008

[In thousands (7,628.9 represents 7,628,900), except as noted. As of May 2008. The Occupational Employment Statistics Survey (OES) collects data in six semiannual panels over a 3-year (November 2005 through May 2008) period on occupational employment and wages of wage and salary workers in nonfarm establishments in the United States, Guam, Puerto Rico, and the Virgin Islands. U.S. totals include data items that are not released separately at the state level due to confidentiality and quality issues. The OES survey uses the Standard Occupational Classification (SOC) system to categorize workers in 1 of 801 detailed occupations. Excludes self employed. For a list of occupations see <<http://www.bls.gov/oes/current/oesstru.htm>>. For more information about methodology, see <<http://www.bls.gov/oes/current/oestec.htm>>]

State	Employed in S&E occupations ¹	Employed workforce	Workforce in S&E occupations ¹ (percent)	State	Employed in S&E occupations ¹	Employed workforce	Workforce in S&E occupations ¹ (percent)
United States	7,628.9	135,185.2	5.6	Nebraska	41.6	928.1	4.5
Alabama	88.9	1,945.3	4.6	Nevada	40.2	1,278.2	3.1
Alaska	18.9	307.8	6.1	New Hampshire	37.8	634.6	6.0
Arizona	147.1	2,637.8	5.6	New Jersey	261.1	3,986.3	6.5
Arkansas	41.5	1,176.1	3.5	New Mexico	49.2	819.5	6.0
California	1,004.1	15,212.6	6.6	New York	446.9	8,633.6	5.2
Colorado	182.6	2,302.3	7.9	North Carolina	207.5	4,063.4	5.1
Connecticut	108.3	1,697.8	6.4	North Dakota	13.5	350.4	3.8
Delaware	30.6	425.2	7.2	Ohio	264.2	5,323.1	5.0
District of Columbia	73.6	635.5	11.6	Oklahoma	65.1	1,557.8	4.2
Florida	336.8	7,771.7	4.3	Oregon	100.5	1,706.7	5.9
Georgia	193.7	4,068.3	4.8	Pennsylvania	295.1	5,705.2	5.2
Hawaii	24.8	612.4	4.0	Rhode Island	23.3	478.4	4.9
Idaho	39.2	650.2	6.0	South Carolina	81.3	1,892.7	4.3
Illinois	300.0	5,910.6	5.1	South Dakota	14.9	396.0	3.8
Indiana	121.4	2,927.6	4.1	Tennessee	98.1	2,755.8	3.6
Iowa	63.1	1,502.6	4.2	Texas	630.2	10,391.4	6.1
Kansas	71.1	1,374.6	5.2	Utah	73.7	1,230.3	6.0
Kentucky	67.1	1,817.9	3.7	Vermont	16.5	301.1	5.5
Louisiana	66.1	1,887.4	3.5	Virginia	315.1	3,671.0	8.6
Maine	24.5	604.2	4.0	Washington	245.5	2,868.9	8.6
Maryland	209.5	2,561.5	8.2	West Virginia	24.2	717.7	3.4
Massachusetts	272.5	3,234.9	8.4	Wisconsin	138.3	2,776.7	5.0
Michigan	267.5	4,142.8	6.5	Wyoming	12.7	284.0	4.5
Minnesota	177.9	2,704.9	6.6				
Mississippi	39.5	1,138.2	3.5	Guam	1.8	58.8	3.0
Missouri	138.4	2,740.2	5.1	Puerto Rico	33.2	999.0	3.3
Montana	22.3	444.1	5.0	Virgin Islands	0.9	44.9	2.0

¹ Science and Engineering includes those occupations listed under SOC11-3021, SOC11-9041, SOC11-9121, SOC15-0000, SOC17-0000, and SOC19-0000.

Source: U.S. Bureau of Labor Statistics, "Employment and Wages from Occupational Employment Statistics (OES) Survey," January 2008; <<http://www.bls.gov/oes/data.htm>> (accessed 21 May 2009).

**Table 796. Research and Development (R&D) Scientists and Engineers—
Employment and Cost by Industry: 2005 to 2007**

[1,104.5 represents 1,104,500]

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 industries⁵	(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 1997 (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: U.S. National Science Foundation, NSF 09-301, *Research and Development in Industry*. See also <<http://www.nsf.gov/statistics/nsf09301/>>.

Table 797. World-Wide Space Launch Events: 2000 to 2008

[(2,729 represents \$2,729,000,000)]

Country	Non-commercial launches				Commercial launches				Launch revenues for commercial events (million dollars)			
	2000	2005	2007	2008	2000	2005	2007	2008	2000	2005	2007	2008
Total	50	37	45	41	35	18	23	28	2,729	1,190	1,548	1,971
United States	21	11	16	9	7	1	3	6	370	70	150	215
Russia	23	18	14	15	13	8	12	11	671	350	477	700
Europe	—	—	—	1	12	5	6	5	1,433	490	840	581
China ¹	5	5	10	11	—	—	—	—	(X)	(X)	(X)	(X)
India	—	1	2	3	—	—	1	—	(X)	(X)	11	(X)
Japan	1	2	2	1	—	—	—	—	(X)	(X)	(X)	(X)
Israel	—	—	1	—	—	—	—	—	(X)	(X)	(X)	(X)
Iran	—	—	—	1	—	—	—	—	(X)	(X)	(X)	(X)
Multinational	—	—	—	—	3	4	1	6	255	280	70	475

— Represents zero. X Not applicable. ¹ See footnote 4, Table 1296.

Source: Federal Aviation Administration, *Commercial Space Transportation: 2008 Year in Review*, and prior years. See also <http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/year_review/>.

Table 798. 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	U.S.				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	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>>.

Table 799. National Aeronautics and Space Administration—Budget Appropriations: 2008 and 2009

[In millions of dollars (17,401.9 represents \$17,401,900,000).]

Budget function/category	2008	2009
Appropriations, total	17,401.9	17,782.4
Science	4,733.2	4,503.0
Earth science	1,237.4	1,379.6
Heliophysics	787.6	591.6
Planetary Science	1,312.6	1,325.6
Astrophysics	1,395.6	1,206.2
Exploration	3,299.4	3,505.5
Constellation systems	2,675.9	3,033.1
Advanced capabilities	623.5	472.3
Aeronautics	511.4	500.0
Space operations	5,427.2	5,764.7
Space shuttle	3,295.4	2,981.7
International space station	1,685.5	2,060.2
Space & flight support	446.2	722.8

Source: U.S. National Aeronautics and Space Administration, "Fiscal Year 2010 Budget Request Summary" <<http://www.nasa.gov/about/budget/index.html>> (accessed 15 May 2009).