

U.S. DOCTORAL AWARDS IN SCIENCE AND ENGINEERING CONTINUE UPWARD TREND IN 2006

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U.S. institutions awarded 29,854 science and engineering (S&E) doctorates in 2006, a record high. The 2006 rise in S&E doctoral awards, 6.7% over 2005, is the fourth consecutive increase (figure 1, table 1). S&E fields reaching all-time high counts in 2006 were biological sciences, computer sciences, mathematics, chemistry, social sciences, and engineering.

A total of 15,742 doctorates in non-S&E fields were awarded in 2006, an increase over the 2005 count but a slight decline from the record number of 15,848 in 2004. Awards in health fields increased to their highest point in the last 10 years (1,906), whereas the count in education was at an all-time low in the same period (6,124).

From 1997 to 2006, awards of S&E doctorates grew by 9.6%, with increases concentrated in the last 4 years of the period. In the same 10-year period, awards of doctorates in all fields grew by 7.2%, whereas awards in non-S&E fields remained relatively level; thus, increases in S&E fields account for most of the growth in doctorates awarded.

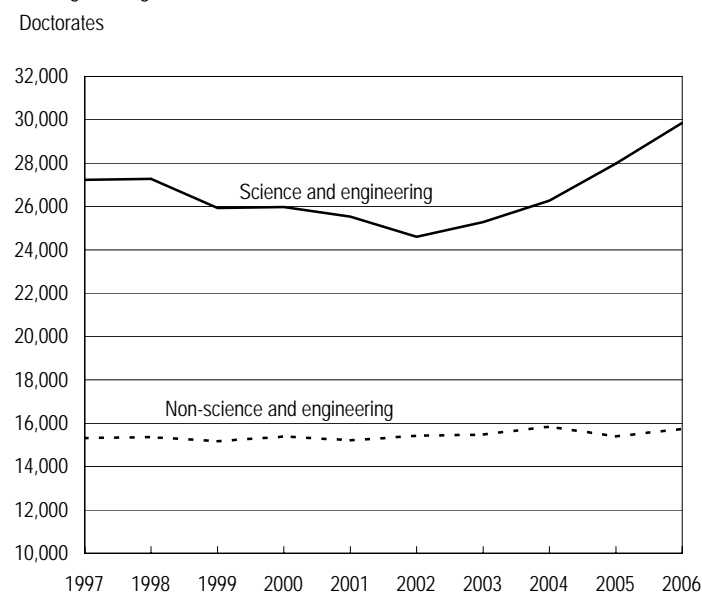
Demographics

S&E doctoral awards increased in nearly all demographic groups in 2006, most notably among women (8.8%) and among non-U.S. citizens (10.9%), a category that includes permanent residents and temporary visa holders (table 2). The increase in awards to non-U.S. citizens was almost three times larger than that to U.S. citizens (3.7%). Since 2002, most demographic groups have shown substantial growth, in particular non-U.S.

citizens (44.1%) and women (25.0%). Among U.S. citizens, the number of awards to Hispanics has increased in the last 5 years (20.6%), whereas awards to American Indians/Alaska Natives have declined (-28.8%).

In 2006, 15,947 doctorates were awarded to non-U.S. citizens, including 1,829 to individuals who were

FIGURE 1. Doctorates awarded in science and engineering and non-science and engineering fields: 1997–2006



NOTE: See table 1 for fields of study included.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates, 2006.



TABLE 1. Doctorates awarded, by major field of study: 1997–2006

Field	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
All fields	42,539	42,637	41,097	41,365	40,737	40,025	40,757	42,123	43,385	45,596
Science and engineering	27,227	27,275	25,933	25,971	25,532	24,609	25,282	26,275	27,989	29,854
Science	21,113	21,354	20,603	20,648	20,021	19,530	20,002	20,498	21,564	22,663
Agricultural sciences	1,079	1,111	1,067	1,042	978	1,010	1,061	1,045	1,038	1,033
Biological sciences	5,785	5,846	5,581	5,853	5,697	5,694	5,695	5,940	6,368	6,631
Computer sciences	909	927	856	860	830	810	866	948	1,130	1,452
Earth, atmospheric, and ocean sciences	804	765	723	694	660	689	683	686	714	757
Mathematics	1,124	1,177	1,083	1,050	1,011	920	993	1,076	1,205	1,327
Physical sciences	3,745	3,800	3,562	3,378	3,364	3,186	3,289	3,338	3,645	3,925
Astronomy	198	206	159	185	186	141	167	165	186	197
Chemistry	2,147	2,216	2,132	1,989	1,981	1,922	2,041	1,987	2,126	2,363
Physics	1,400	1,378	1,271	1,204	1,197	1,123	1,081	1,186	1,333	1,365
Psychology	3,557	3,673	3,668	3,617	3,399	3,207	3,276	3,327	3,323	3,263
Social sciences	4,110	4,055	4,063	4,154	4,082	4,014	4,139	4,138	4,141	4,275
Engineering	6,114	5,921	5,330	5,323	5,511	5,079	5,280	5,777	6,425	7,191
Aeronautical/astronautical engineering	273	241	206	214	203	209	200	201	219	238
Chemical engineering	767	776	674	726	730	705	649	726	875	893
Civil engineering	655	650	584	556	595	627	673	673	758	803
Electrical engineering	1,720	1,595	1,478	1,543	1,579	1,394	1,465	1,651	1,851	2,133
Industrial/manufacturing engineering	246	229	211	176	206	230	214	217	221	235
Materials/metallurgical engineering	582	565	469	451	497	396	474	511	540	624
Mechanical engineering	1,022	1,022	855	864	953	827	814	852	978	1,148
Other engineering	849	843	853	793	748	691	791	946	983	1,117
Non-science and engineering	15,312	15,362	15,164	15,394	15,205	15,416	15,475	15,848	15,396	15,742
Education	6,576	6,569	6,551	6,438	6,348	6,503	6,643	6,635	6,226	6,124
Health	1,421	1,499	1,407	1,590	1,541	1,654	1,633	1,720	1,785	1,906
Humanities	5,035	5,117	5,035	5,212	5,177	5,051	5,020	5,013	4,949	5,121
Professional/other/unknown	2,280	2,177	2,171	2,154	2,139	2,208	2,179	2,480	2,436	2,591

NOTE: Categories are grouped differently from questionnaire and summary reports in that linguistics, history of science, American studies, and archaeology are included in social sciences and not in humanities, and public administration is included in social sciences and not in professional fields, according to National Science Foundation taxonomy.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates.

permanent residents and 14,118 who were in the United States on a temporary visa (table 3). Awards to non-U.S. citizens constituted 37.2% of awards to all doctorate recipients in 2006 who reported citizenship status and 45.2% of awards to those in S&E fields who reported citizenship status (figure 2).

Non-U.S. citizens accounted for more than half of all doctorate recipients in each of the engineering fields and in computer sciences (64.8%), mathematics (57.2%), and physics (58.0%). The proportion of awards to non-U.S. citizens was largest in engineering (67.7%), particularly in electrical engineering (77.3%), civil engineering (73.5%), and industrial/manufacturing engineering (72.4%). Citizens of China constituted

26.6% of all engineering doctorate recipients with known citizenship status; citizens of India and Korea represented 10.4% and 7.4%, respectively.

For all S&E fields combined, the highest numbers of non-U.S. citizen doctorate recipients were from China, India, and Korea (table 4).

U.S. citizens earned 26,917 doctoral awards in 2006 (62.8% of all doctorate recipients with known citizenship status). The share of awards to U.S. citizens was largest in non-S&E fields, particularly in education (87.1%) (percentages earned by U.S. citizens are complements of those shown in figure 2).

TABLE 2. Science and engineering doctorates awarded, by selected characteristics of recipients: 2002–06

Characteristic	2002	2003	2004	2005	2006
All S&E doctorate recipients	24,609	25,282	26,275	27,989	29,854
Male	15,388	15,763	16,418	17,407	18,341
Female	9,172	9,519	9,856	10,539	11,469
U.S. citizen	14,363	14,641	14,743	14,911	15,459
American Indian/Alaska Native	66	72	59	66	47
Asian	1,038	1,008	1,066	1,114	1,164
Black	637	615	689	640	664
Hispanic ^a	652	659	645	725	786
White	11,504	11,618	11,632	11,844	12,227
Other ^b	321	436	475	395	412
Non-U.S. citizen ^c	8,867	9,484	10,158	11,519	12,775

^a Includes Mexican Americans, Puerto Ricans, and other Hispanics.

^b Includes Native Hawaiian/other Pacific Islanders and persons reporting multiple race/ethnicity.

^c Includes permanent residents and individuals with temporary visas.

NOTE: Individuals whose characteristics are unknown (sex, citizenship, race/ethnicity), or who reported race/ethnicity other than listed, are included in total but not shown separately.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates.

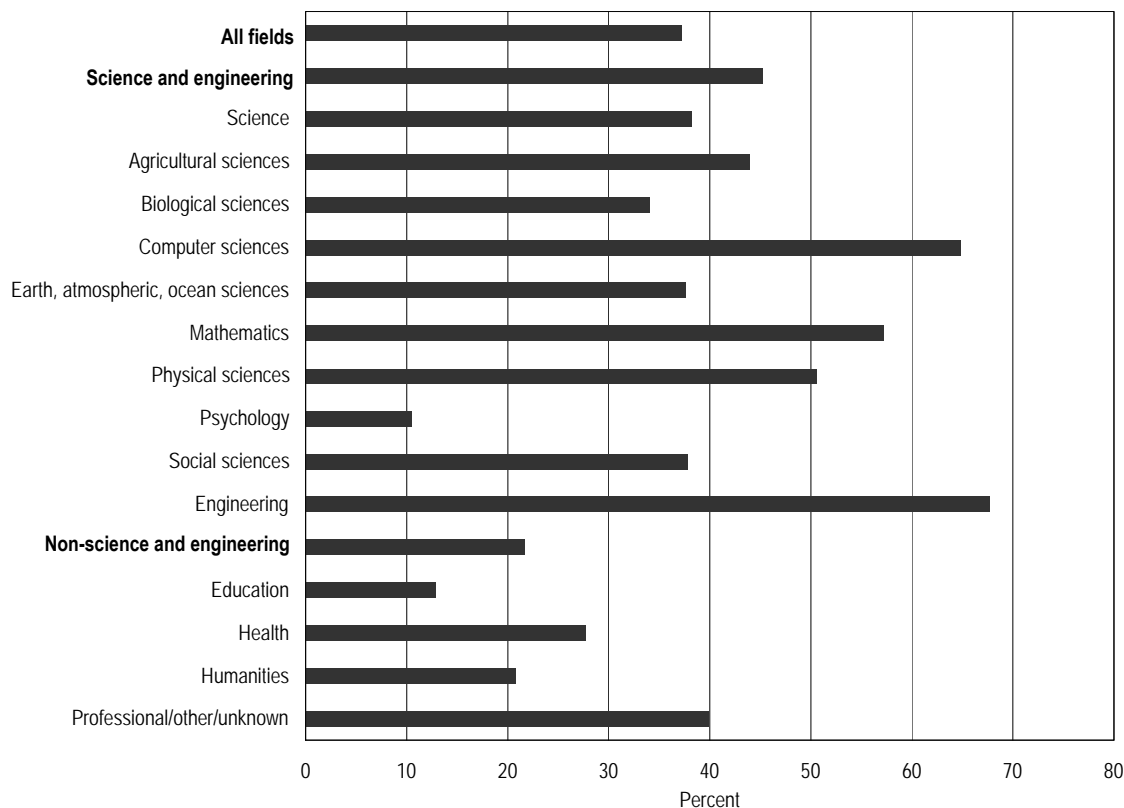
TABLE 3. Doctorates awarded to non-U.S. citizens, by field of study: 1997–2006

Field	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
All fields	12,123	12,123	11,370	11,614	11,642	11,405	12,224	13,160	14,426	15,947
Science and engineering	9,787	9,738	8,896	9,073	9,217	8,867	9,484	10,158	11,519	12,775
Science	6,639	6,680	6,301	6,272	6,129	5,945	6,306	6,605	7,481	8,203
Agricultural sciences	500	566	543	507	437	465	469	453	445	428
Biological sciences	1,905	1,870	1,752	1,750	1,581	1,608	1,661	1,704	1,936	2,148
Computer sciences	420	410	402	433	414	413	435	509	664	890
Earth, atmospheric, and ocean sciences	280	258	268	212	248	259	233	247	255	268
Mathematics	541	536	511	499	490	471	486	583	664	734
Physical sciences	1,445	1,501	1,364	1,350	1,386	1,267	1,367	1,464	1,685	1,880
Astronomy	44	67	43	54	56	36	39	49	63	69
Chemistry	804	831	773	771	774	689	783	794	880	1,050
Physics	597	603	548	525	556	542	545	621	742	761
Psychology	226	255	223	239	227	229	264	253	288	319
Social sciences	1,322	1,284	1,238	1,282	1,346	1,233	1,391	1,392	1,544	1,536
Engineering	3,148	3,058	2,595	2,801	3,088	2,922	3,178	3,553	4,038	4,572
Aeronautical/astronautical engineering	110	83	91	84	95	116	121	122	120	129
Chemical engineering	431	419	320	350	364	361	362	390	511	492
Civil engineering	388	368	304	320	347	386	418	456	517	554
Electrical engineering	899	874	764	900	1,026	908	1,007	1,137	1,289	1,563
Industrial/manufacturing engineering	135	137	121	104	125	144	154	149	144	155
Materials/metallurgical engineering	288	276	229	204	273	207	284	299	334	367
Mechanical engineering	531	535	419	488	536	503	491	553	637	757
Other engineering	366	366	347	351	322	297	341	447	486	555
Non-science and engineering	2,336	2,385	2,474	2,541	2,425	2,538	2,740	3,002	2,907	3,172
Education	576	654	695	666	619	592	717	743	644	740
Health	342	366	363	381	385	392	388	438	465	485
Humanities	819	832	822	861	823	860	897	961	991	997
Professional/other/unknown	599	533	594	633	598	694	738	860	807	950

NOTES: Categories are grouped differently from questionnaire and summary reports in that linguistics, history of science, American studies, and archaeology are included in social sciences and not in humanities, and public administration is included in social sciences and not in professional fields, according to National Science Foundation taxonomy. Non-U.S. citizens include individuals holding permanent or temporary U.S. visas.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates.

FIGURE 2. Non-U.S. citizens' share of doctorates awarded, by field of study: 2006



NOTES: Non-U.S. citizens include individuals holding permanent or temporary U.S. visas. Percentages are based on respondents who reported citizenship status in each field. Denominators for these percentages are not presented in this report.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates.

TABLE 4. Top 10 countries/economies of citizenship of non-U.S. citizens earning science and engineering doctorates at U.S. institutions: 2006

Country/economy	Doctorate recipients
Top 10	9,048
China ^a	4,323
India	1,524
Korea	1,219
Taiwan	431
Canada	363
Turkey	357
Russia	223
Japan	222
Thailand	199
Romania	187
All others ^b	6,899

^aIncludes Hong Kong.

^bIncludes non-U.S. citizens of unknown country/economy of citizenship.

NOTE: Non-U.S. citizens include individuals holding permanent or temporary U.S. visas.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates.

Data Notes

The data presented here are from the Survey of Earned Doctorates (SED) for academic year 2006 (1 July 2005 to 30 June 2006). Each individual completing requirements for a research doctorate from a university in the United States or Puerto Rico receives the SED. In 2006, 92.1% of the 45,596 new doctorate recipients completed the survey. The field of study information used in this report was obtained for all doctorate recipients in 2006; information on sex was obtained for 99.8%, race/ethnicity for 93.4%, citizenship status for 94.0%, and country of citizenship for 93.9%.

This survey is sponsored by six federal agencies: the National Science Foundation, the National Institutes of Health, the U.S. Department of Education, the U.S. Department of Agriculture, the National Endowment for the Humanities, and the National Aeronautics and

Space Administration. Additional data for all fields of study are available in the interagency report *Doctorate Recipients from U.S. Universities: Summary Report 2006*.

The full set of detailed tables from this survey will be available in the report *Science and Engineering Doctorate Awards: 2006* at <http://www.nsf.gov/statistics/doctorates/>. For further information, contact

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