

2007 RECORDS FIFTH CONSECUTIVE ANNUAL INCREASE IN U.S. DOCTORAL AWARDS

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U.S. institutions awarded 48,079 doctorates in 2007, the highest number ever reported by the Survey of Earned Doctorates (SED) and an increase of 5.4% over 2006. This is the fifth consecutive annual increase in U.S. doctoral awards (table 1).

Numbers of doctorates awarded in 2007 rose in both the science and engineering (S&E) and non-S&E field-of-study categories. S&E doctorates totaled 31,801 (66.1% of all doctorates) in 2007, an increase of 6.5% over 2006 and 16.6% since 1998. All science fields except chemistry and psychology reached record numbers of awards in 2007, with the highest number being awarded in the biological sciences (7,173, or 14.9% of all doctorates). In chemistry, awards decreased by 1.5% in 2007 but have increased overall by 5.1% since 1998. The number of psychology awards increased 1.1% over 2006 but have declined 10.3% since 1998, from 3,673 to 3,294. Awards in engineering increased 7.8% in 2007 and rose 30.8% over the last decade, from 5,921 in 1998 to 7,745 in 2007. Every engineering field but mechanical engineering reported record numbers of awards in 2007. Electrical engineering was the fastest growing engineering field during the decade 1998–2007, with the number of doctorates awarded in that field increasing 51.0%.

The number of awards in non-S&E fields reached 16,278 in 2007 and grew at a slower pace than did those in S&E fields: 3.4% in the last year and 6.0% since 1998 (figure 1). Within non-S&E fields, awards in education reversed their downward trend, growing

from 6,120 in 2006 to 6,429 in 2007, but were 3.2% below their 2003 peak (6,643). Doctoral awards in the humanities declined by 4.6% in the last year and have declined by 4.4% since 1998. Awards in health (2,134 in 2007) showed substantial growth: a 12.0% increase in 2007 and a 42.4% increase over the last decade. Similarly, doctorates in professional fields (2,825 in 2007) increased 8.9% over 2006 and have increased 29.8% since 1998.

Demographics

Sex and Citizenship

S&E doctorates awarded to men, women, U.S. citizens, and non-U.S. citizens all rose in 2007 (table 2). Awards of S&E doctorates to non-U.S. citizens (permanent residents and temporary visa holders) grew at a faster rate (6.0%) than did those to U.S. citizens (3.6%), and growth in the number of female doctorate recipients (6.9%) was greater than growth in male doctorate recipients (6.2%). Of these four demographic groups, non-U.S. citizens achieved the highest growth rate (42.8%) over the 5-year period ending in 2007.

The number of non-S&E awards also grew in each of these four demographic groups, but at a slower rate. Awards to women in non-S&E fields grew 5.8% in 2007 and has grown 6.9% since 2003, whereas awards to men have been more stable (growth of 0.2% in 2007 and 2.5% since 2003). Growth in non-S&E doctorates awarded was substantially higher for non-U.S. citizens (7.1%) than for U.S. citizens (0.8%) in 2007.



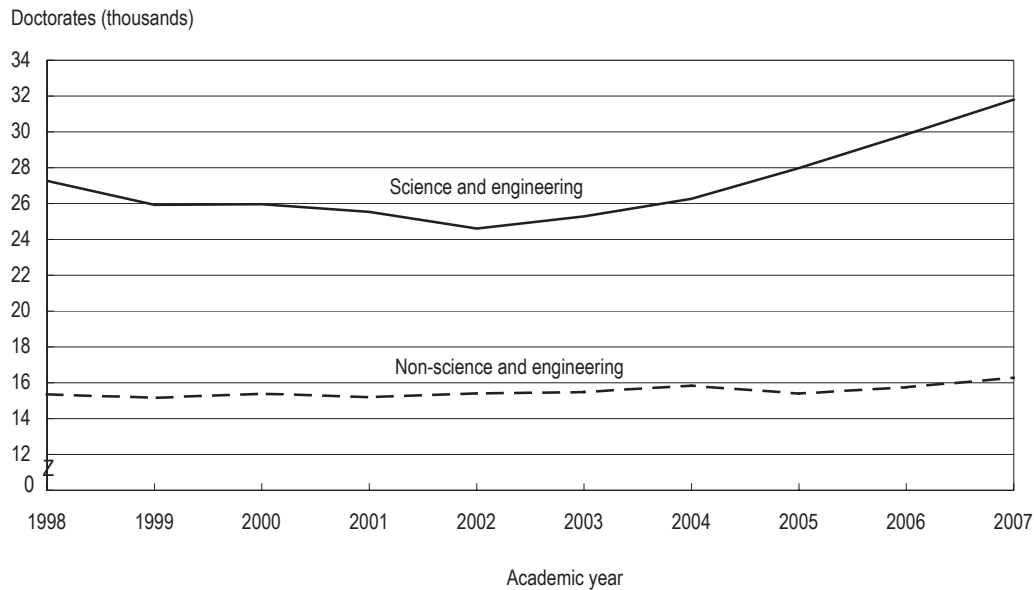
TABLE 1. Doctorates awarded, by major field of study: 1998–2007

| Field | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| All fields | 42,637 | 41,097 | 41,365 | 40,737 | 40,024 | 40,757 | 42,117 | 43,378 | 45,598 | 48,079 |
| Science and engineering | 27,275 | 25,933 | 25,971 | 25,532 | 24,608 | 25,282 | 26,273 | 27,984 | 29,855 | 31,801 |
| Science | 21,354 | 20,603 | 20,648 | 20,022 | 19,527 | 20,001 | 20,496 | 21,557 | 22,672 | 24,056 |
| Agricultural sciences | 1,111 | 1,067 | 1,042 | 980 | 1,010 | 1,061 | 1,045 | 1,038 | 1,033 | 1,137 |
| Biological sciences | 5,846 | 5,581 | 5,853 | 5,694 | 5,694 | 5,696 | 5,942 | 6,366 | 6,641 | 7,173 |
| Computer sciences | 927 | 856 | 861 | 830 | 809 | 867 | 948 | 1,129 | 1,453 | 1,662 |
| Earth, atmospheric, and ocean sciences | 766 | 723 | 694 | 660 | 689 | 683 | 686 | 714 | 757 | 876 |
| Mathematics | 1,177 | 1,083 | 1,050 | 1,010 | 919 | 993 | 1,076 | 1,205 | 1,325 | 1,393 |
| Physical sciences | 3,800 | 3,562 | 3,378 | 3,366 | 3,187 | 3,287 | 3,335 | 3,643 | 3,929 | 4,106 |
| Astronomy | 206 | 159 | 185 | 186 | 141 | 167 | 165 | 186 | 197 | 224 |
| Chemistry | 2,216 | 2,132 | 1,989 | 1,982 | 1,923 | 2,040 | 1,986 | 2,126 | 2,363 | 2,328 |
| Physics | 1,378 | 1,271 | 1,204 | 1,198 | 1,123 | 1,080 | 1,184 | 1,331 | 1,369 | 1,554 |
| Psychology | 3,673 | 3,668 | 3,615 | 3,401 | 3,206 | 3,275 | 3,325 | 3,321 | 3,258 | 3,294 |
| Social sciences | 4,054 | 4,063 | 4,155 | 4,081 | 4,013 | 4,139 | 4,139 | 4,141 | 4,276 | 4,415 |
| Engineering | 5,921 | 5,330 | 5,323 | 5,510 | 5,081 | 5,281 | 5,777 | 6,427 | 7,183 | 7,745 |
| Aeronautical/astronautical engineering | 241 | 206 | 214 | 202 | 209 | 200 | 201 | 219 | 238 | 267 |
| Chemical engineering | 776 | 674 | 726 | 730 | 705 | 648 | 726 | 875 | 891 | 921 |
| Civil engineering | 650 | 584 | 556 | 595 | 630 | 674 | 673 | 758 | 803 | 865 |
| Electrical engineering | 1,595 | 1,478 | 1,544 | 1,579 | 1,393 | 1,466 | 1,651 | 1,851 | 2,132 | 2,408 |
| Industrial/manufacturing engineering | 229 | 211 | 176 | 206 | 230 | 214 | 217 | 221 | 234 | 280 |
| Materials/metallurgical engineering | 565 | 469 | 451 | 497 | 396 | 475 | 510 | 540 | 625 | 679 |
| Mechanical engineering | 1,022 | 855 | 864 | 953 | 827 | 814 | 852 | 978 | 1,146 | 1,129 |
| Other engineering | 843 | 853 | 792 | 748 | 691 | 790 | 947 | 985 | 1,114 | 1,196 |
| Non-science and engineering | 15,362 | 15,164 | 15,394 | 15,205 | 15,416 | 15,475 | 15,844 | 15,394 | 15,743 | 16,278 |
| Education | 6,569 | 6,551 | 6,436 | 6,349 | 6,503 | 6,643 | 6,633 | 6,224 | 6,120 | 6,429 |
| Education administration | 2,066 | 2,044 | 2,031 | 2,070 | 2,346 | 2,356 | 2,340 | 2,165 | 2,050 | 2,154 |
| Education research | 2,584 | 2,732 | 2,667 | 2,637 | 2,776 | 2,718 | 2,805 | 2,672 | 2,750 | 2,653 |
| Teacher education | 342 | 293 | 261 | 296 | 262 | 242 | 270 | 263 | 250 | 298 |
| Teaching fields | 954 | 893 | 824 | 723 | 686 | 714 | 758 | 663 | 707 | 881 |
| Other education | 623 | 589 | 653 | 623 | 433 | 613 | 460 | 461 | 363 | 443 |
| Health | 1,499 | 1,407 | 1,591 | 1,540 | 1,655 | 1,633 | 1,719 | 1,784 | 1,905 | 2,134 |
| Humanities | 5,117 | 5,036 | 5,213 | 5,178 | 5,050 | 5,020 | 5,012 | 4,950 | 5,125 | 4,890 |
| Foreign languages and literature | 643 | 626 | 642 | 620 | 627 | 623 | 587 | 607 | 615 | 604 |
| History | 946 | 960 | 1,019 | 991 | 983 | 895 | 927 | 881 | 917 | 890 |
| Letters | 1,600 | 1,516 | 1,612 | 1,493 | 1,455 | 1,416 | 1,408 | 1,389 | 1,457 | 1,357 |
| Other humanities | 1,928 | 1,934 | 1,940 | 2,074 | 1,985 | 2,086 | 2,090 | 2,073 | 2,136 | 2,039 |
| Professional fields | 2,177 | 2,170 | 2,154 | 2,138 | 2,208 | 2,179 | 2,480 | 2,436 | 2,593 | 2,825 |
| Business management/administrative services | 1,175 | 1,109 | 1,065 | 1,064 | 1,113 | 1,036 | 1,254 | 1,170 | 1,310 | 1,505 |
| Communication | 373 | 379 | 389 | 390 | 397 | 415 | 450 | 487 | 510 | 557 |
| Other professional fields | 565 | 579 | 643 | 633 | 636 | 669 | 725 | 743 | 731 | 698 |
| Unknown | 64 | 103 | 57 | 51 | 62 | 59 | 51 | 36 | 42 | 65 |

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.

FIGURE 1. Doctorates awarded in science and engineering and non-S&E fields: 1998–2007



NOTE: See table 1 for science and engineering (S&E) and non-S&E fields.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates, 2007.

TABLE 2. Doctorates awarded, by category of field and selected characteristics of recipient: 2003–07

| Characteristic | 2003 | 2004 | 2005 | 2006 | 2007 |
|------------------------------------|--------|--------|--------|--------|--------|
| Science and engineering fields | 25,282 | 26,275 | 27,989 | 29,854 | 31,801 |
| Male | 15,762 | 16,418 | 17,404 | 18,367 | 19,509 |
| Female | 9,520 | 9,854 | 10,537 | 11,469 | 12,259 |
| U.S. citizen | 14,640 | 14,742 | 14,907 | 15,459 | 16,022 |
| Non-U.S. citizen ^a | 9,485 | 10,157 | 11,518 | 12,777 | 13,545 |
| Non-science and engineering fields | 15,475 | 15,844 | 15,394 | 15,743 | 16,278 |
| Male | 6,493 | 6,546 | 6,330 | 6,646 | 6,657 |
| Female | 8,982 | 9,297 | 9,039 | 9,074 | 9,600 |
| U.S. citizen | 11,872 | 11,725 | 11,415 | 11,457 | 11,546 |
| Non-U.S. citizen ^a | 2,740 | 3,002 | 2,907 | 3,176 | 3,402 |

^a Permanent residents and temporary visa holders.

NOTE: Individuals of unknown sex or citizenship are included in totals but are not shown separately.

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

Race and Ethnicity

A total of 5,570 U.S. citizens who were members of racial/ethnic minority groups² earned doctoral degrees in 2007. Among the four largest minority populations, black citizens earned the largest number of doctorates (1,821), followed by Asians (1,561), Hispanics (1,489), and American Indians/Alaska Natives (138) (table 3).

The number of doctorates awarded to all minority U.S. citizens grew by 13.1% over the 5-year period 2003–07 and by 6.9% percent from 2006 to 2007. In comparison, the number of white U.S. citizens earning doctorates increased 3.3% from 2003 to 2007 and 1.5% in the last year of that period. The numbers of Hispanic and Asian doctorate recipients grew substantially from 2003 to 2007, increasing by 16.4% and 13.7%, respectively. The number of doctorates earned by American Indians/Alaska Natives rebounded sharply from a

TABLE 3. Doctorates awarded to U.S. citizens, by race/ethnicity and broad field of study: 2003–07

| Field | 2003 | 2004 | 2005 | 2006 | 2007 |
|-------------------------------|--------|--------|--------|--------|--------|
| All U.S. citizens | 26,512 | 26,467 | 26,322 | 26,916 | 27,568 |
| American Indian/Alaska Native | 134 | 129 | 139 | 118 | 138 |
| Science | 61 | 54 | 58 | 44 | 71 |
| Engineering | 11 | 5 | 8 | 3 | 7 |
| Education | 39 | 47 | 42 | 35 | 36 |
| Health | 2 | 3 | 4 | 6 | 7 |
| Humanities | 15 | 12 | 21 | 21 | 11 |
| Professional fields | 6 | 8 | 6 | 9 | 6 |
| Asian | 1,373 | 1,452 | 1,495 | 1,562 | 1,561 |
| Science | 798 | 839 | 873 | 900 | 895 |
| Engineering | 211 | 228 | 242 | 265 | 245 |
| Education | 108 | 113 | 112 | 125 | 140 |
| Health | 69 | 63 | 85 | 80 | 89 |
| Humanities | 130 | 142 | 131 | 133 | 134 |
| Professional fields | 57 | 67 | 52 | 59 | 58 |
| Black | 1,709 | 1,883 | 1,689 | 1,658 | 1,821 |
| Science | 542 | 606 | 555 | 576 | 636 |
| Engineering | 71 | 84 | 85 | 89 | 78 |
| Education | 745 | 781 | 661 | 605 | 701 |
| Health | 74 | 102 | 114 | 119 | 106 |
| Humanities | 142 | 157 | 158 | 148 | 161 |
| Professional fields | 135 | 153 | 116 | 121 | 139 |
| Hispanic ^a | 1,279 | 1,180 | 1,298 | 1,370 | 1,489 |
| Science | 567 | 572 | 654 | 686 | 727 |
| Engineering | 91 | 73 | 73 | 101 | 111 |
| Education | 328 | 262 | 278 | 278 | 324 |
| Health | 38 | 43 | 41 | 41 | 63 |
| Humanities | 205 | 180 | 176 | 192 | 200 |
| Professional fields | 50 | 50 | 76 | 72 | 64 |
| White | 20,897 | 20,767 | 20,856 | 21,276 | 21,585 |
| Science | 10,170 | 10,174 | 10,317 | 10,592 | 10,947 |
| Engineering | 1,461 | 1,463 | 1,525 | 1,631 | 1,695 |
| Education | 4,106 | 3,977 | 3,932 | 3,796 | 3,872 |
| Health | 935 | 938 | 937 | 985 | 1,080 |
| Humanities | 3,231 | 3,165 | 3,024 | 3,156 | 2,855 |
| Professional fields | 994 | 1,050 | 1,121 | 1,116 | 1,136 |
| Other ^b | 428 | 445 | 457 | 504 | 561 |
| Science | 241 | 240 | 245 | 278 | 308 |
| Engineering | 17 | 25 | 34 | 46 | 52 |
| Education | 74 | 66 | 68 | 65 | 82 |
| Health | 19 | 22 | 22 | 13 | 24 |
| Humanities | 59 | 65 | 67 | 80 | 67 |
| Professional fields | 18 | 27 | 21 | 22 | 28 |

^a Includes Mexican American, Puerto Rican, and other Hispanic.

^b Includes Native Hawaiian/Other Pacific Islanders, and multiple race/ethnicity.

NOTE: Individuals of unknown race/ethnicity are included in totals for U.S. citizens but are not shown separately.

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

decline in 2006 and grew by 16.9% in 2007. However, longer-term growth in the number of these awards has been modest, with a 3.0% increase since 2003.

Owing to faster growth in the number of minority doctorate recipients relative to white doctorate recipients, minority groups' share of the total number of doctorates has increased steadily over time. Members of minority groups accounted for 20.2% of the doctorates awarded to U.S. citizens in 2007, 1.6 percentage points higher than their share in 2003.

The relative share of each minority group to the total number of doctorates awarded to minority U.S. citizens varied across the broad fields of study in 2007. Blacks accounted for the largest share of doctorates earned by minorities in education (54.6%), health (36.7%), and professional fields (47.1%). Asians accounted for the largest proportion of science (33.9%) and engineering (49.7%) doctorates earned by minority citizens, and Hispanics led in the humanities (34.9%). American Indians/Alaska Natives earned less than 3% of the doctorates awarded to minority citizens in each of the broad fields of study. Although the proportions of doctorates awarded to racial/ethnic groups in each broad field has changed from year to year, the relative rankings of these four minority groups has changed very little within each field, and the top-ranking group in each field remained constant from 2003 to 2007.

For the first time ever, women doctorate recipients outnumbered their male counterparts in each of the

racial/ethnic groups in 2007. The proportion of women was highest among black doctorate recipients (66.1%) and lowest among white doctorate recipients (50.2%). Overall, of the doctorate recipients who reported race/ethnicity, women earned 58.6% of the doctorates awarded to minority U.S. citizens and 51.7% of those awarded to all citizens in 2007. Women's share of the number of doctorates awarded to minority citizens has increased by 3 percentage points since 2003 (table 4).

Asian women represent the fastest growing segment of the minority population receiving doctorates, with numbers of doctorate awards to this group increasing 30.3% from 2003 to 2007. The growth in the number of doctorates earned by Hispanic women (22.5%) and American Indian/Alaska Native men (17.3%) was also substantial during this period.

The proportion of women among minority doctorate recipients varied across the broad fields of study (figure 2). In 2007 women earned 77.2% of the doctorates awarded to minority U.S. citizens in the field of health, 72.1% of those awarded in education, and 61.7% of those awarded in professional fields. Minority men earned more doctorates than minority women in only one broad field, engineering, where they were 67.8% of the minority doctorate recipients. The proportion of women among minority doctorate recipients exceeded the proportion of women among white doctorate recipients by at least 3 percentage points in every broad field of study.

TABLE 4. Doctorates awarded to U.S. citizens, by race/ethnicity and sex: 2003–07

| Race/ethnicity | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| All U.S. citizens | 13,095 | 13,417 | 12,998 | 13,469 | 12,793 | 13,529 | 13,276 | 13,640 | 13,317 | 14,251 |
| American Indian/Alaska Native | 52 | 82 | 56 | 73 | 57 | 82 | 54 | 64 | 61 | 77 |
| Asian | 745 | 628 | 728 | 724 | 761 | 733 | 770 | 792 | 743 | 818 |
| Black | 596 | 1,113 | 647 | 1,236 | 594 | 1,095 | 579 | 1,079 | 618 | 1,203 |
| Hispanic ^a | 595 | 684 | 542 | 638 | 548 | 750 | 615 | 755 | 651 | 838 |
| White | 10,507 | 10,390 | 10,457 | 10,310 | 10,414 | 10,442 | 10,779 | 10,497 | 10,750 | 10,835 |
| Other ^b | 195 | 233 | 200 | 245 | 188 | 268 | 233 | 271 | 235 | 326 |

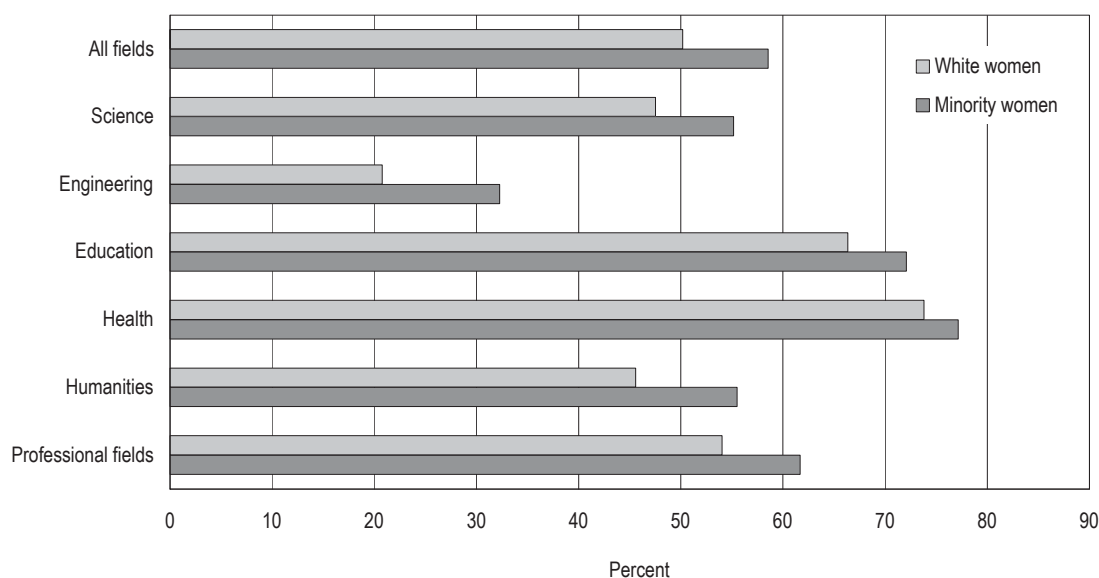
^a Includes Mexican American, Puerto Rican, and other Hispanic.

^b Includes Native Hawaiian/Other Pacific Islanders, and multiple race/ethnicity.

NOTE: Individuals of unknown race/ethnicity are included in totals for U.S. citizens but are not shown separately.

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

FIGURE 2. Women's share of doctorates awarded to white and minority U.S. citizens, by field of study: 2007



NOTE: Minority U.S. citizens are American Indians/Alaska Natives, Asians, blacks, Hispanics, Native Hawaiian/Other Pacific Islanders, and persons of multiple race/ethnicity.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Earned Doctorates: 2007.

Data Notes

The data presented here are from the Survey of Earned Doctorates for the academic year 2007 (1 July 2006 to 30 June 2007). Each individual completing requirements for a research doctorate from a university in the United States or Puerto Rico receives the SED. Research doctoral programs are oriented toward preparing students to make original contributions to knowledge in a field and typically entail writing a dissertation. Doctoral degrees such as the PhD, DSc, and research EdD are covered by this survey; professional degrees (e.g., MD, DDS, JD, and PsyD) are not. For convenience throughout this report, the terms “doctorate” and “doctoral degree” are used to represent any of the research doctoral degrees covered by the survey.

In 2007, 91.6% of the 48,079 new doctorate recipients completed the survey. The field of study information used in this report was obtained for all 2007 doctorate

recipients, information on sex was obtained for 99.9%, race/ethnicity for 91.9%, and citizenship status for 92.6%.

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 will be presented in the forthcoming interagency report *Doctorate Recipients from U.S. Universities: Summary Report 2007*, spring 2009.

The full set of detailed tables from this survey will appear in the report *Science and Engineering Doctorate Awards: 2007*, at <http://www.nsf.gov/statistics/doctorates/>. Individual detailed tables from the 2007 survey may be available in advance of publication of the full report. For further information, contact Mark Fiegner.

Notes

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2. Minority groups are American Indian/Alaska Native, Asian, black, Hispanic (which includes Mexican American, Puerto Rican, and other Hispanic), Native Hawaiian/Other Pacific Islanders, and persons of multiple race/ethnicity.

NSF 09-307

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