INFOBRIEF
SRS Science Resources Statistics

National Science Foundation
Directorate for Social, Behavioral, and Economic Sciences

NSF 02-316
April 2002

# DECLINES IN U.S. DOCTORATE AWARDS IN PHYSICS AND ENGINEERING

by Susan T. Hill

In the United States, the number of doctorates awarded annually in the field of physics, after hitting an all-time high in academic year 1994, declined 22 percent by 2000, according to data from the Survey of Earned Doctorates for 2000 (table 1). Similarly, engineering doctorate awards peaked about mid-decade (in 1996) and then declined 15 percent between 1996 and 2000 (although there was stability between 1999 and 2000).

Table 1. **Doctorates awarded in physics and engineering: 1993–2000**

| Academic year | Physics | Engineering |
|---|---|---|
| 1993 | 1,399 | 5,698 |
| 1994 | 1,548 | 5,822 |
| 1995 | 1,479 | 6,008 |
| 1996 | 1,484 | 6,305 |
| 1997 | 1,401 | 6,114 |
| 1998 | 1,377 | 5,927 |
| 1999 | 1,270 | 5,328 |
| 2000 | 1,205 | 5,330 |

**SOURCE:** National Science Foundation/Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2000,* Detailed Statistical Tables, NSF 02-305 (Arlington, VA, 2001)

A drop in awards to non-U.S. citizens accounted for over half of the decline in physics doctorates (59 percent) and for just under three-quarters of the decline in engineering doctorates (74 percent). Specifically, the number of non-U.S. citizens earning physics doctorates from U.S. universities dropped 28 percent over the 1994–2000 period (table 2). The number of non-U.S. citizens receiving engineering doctorates fell 20 percent between 1996 and 2000 (table 3).

Much of the declines in doctorate awards in physics and engineering can be traced to a decreasing number of doctoral recipients from selected East Asian countries. A decrease in doctorates awarded to citizens of China accounts for about half of the decline in physics doctorates from 1994 to 2000 (table 2). In 1994, the peak year for physics doctorate awards, citizens of China accounted for 19 percent of all physics doctorates from U.S. universities, but by 2000, they accounted for 9 percent.

*Over half of the declines in physics and engineering doctorate awards since the mid-1990s are accounted for by decreases in awards to non-U.S. citizens, particularly those from selected East Asian countries.*

In engineering, nearly two-thirds of the decline in doctorate awards to non-U.S. citizens is accounted for by decreases in awards to citizens of three East Asian countries/economies – China, South Korea, and Taiwan. The number of engineering doctorate recipients from South Korea began to decline after 1993, while the number from Taiwan began to decline after 1994. Awards to Chinese citizens in engineering, like those in physics, declined beginning in 1996; however, doctoral awards in engineering to Chinese citizens increased in 2000 (table 3).

## User Notes

The data presented in this InfoBrief were obtained from the Survey of Earned Doctorates (SED); these data are collected from all individual doctorate

Table 2. **Physics doctorates awarded by citizenship: 1993–2000**

| Academic year | Total[1] | U.S. citizens | Non - U.S. citizens | | |
|---|---|---|---|---|---|
| | | | All countries | China | Other countries |
| 1993 | 1,399 | 704 | 652 | 269 | 383 |
| 1994 | 1,548 | 789 | 726 | 292 | 434 |
| 1995 | 1,479 | 764 | 694 | 256 | 438 |
| 1996 | 1,484 | 761 | 669 | 206 | 463 |
| 1997 | 1,401 | 731 | 598 | 146 | 452 |
| 1998 | 1,377 | 705 | 604 | 135 | 469 |
| 1999 | 1,270 | 654 | 546 | 114 | 432 |
| 2000 | 1,205 | 622 | 523 | 109 | 414 |

[1]Includes a small number of persons whose citizenship was unknown.

**SOURCE:** National Science Foundation/Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2000,* Detailed Statistical Tables, NSF 02-305 (Arlington, VA, 2001)

Table 3. **Engineering doctorates awarded by citizenship: 1993–2000**

| Academic year | Total[1] | U.S. citizens | Non - U.S. citizens | | | | |
|---|---|---|---|---|---|---|---|
| | | | All countries | South Korea | China | Taiwan | Other countries |
| 1993 | 5,698 | 2,228 | 3,253 | 484 | 543 | 592 | 1,634 |
| 1994 | 5,822 | 2,215 | 3,491 | 429 | 656 | 670 | 1,736 |
| 1995 | 6,008 | 2,386 | 3,480 | 344 | 773 | 616 | 1,747 |
| 1996 | 6,305 | 2,594 | 3,513 | 323 | 804 | 572 | 1,814 |
| 1997 | 6,114 | 2,736 | 3,144 | 299 | 636 | 432 | 1,777 |
| 1998 | 5,927 | 2,565 | 3,061 | 282 | 668 | 378 | 1,733 |
| 1999 | 5,328 | 2,473 | 2,593 | 264 | 580 | 301 | 1,448 |
| 2000 | 5,330 | 2,206 | 2,794 | 284 | 711 | 285 | 1,514 |

[1]Includes a small number of persons whose citizenship was unknown.

**SOURCE:** National Science Foundation/Division of Science Resources Statistics, *Science and Engineering Doctorate Awards: 2000,* Detailed Statistical Tables, NSF 02-305 (Arlington, VA, 2001)

recipients via a questionnaire distributed by graduate deans to persons completing their doctorates. The survey has been conducted annually since 1957 for the National Science Foundation and five other Federal agencies. The data for a given academic year include all doctorates awarded in the 12-month period ending June 30 of that year. For further information on the survey methodology or for detailed statistical tables, see <http://www.nsf.gov/sbe/srs/ssed/sedmeth.htm>.

This InfoBrief was prepared by:

Susan T. Hill
Division of Science Resources Statistics
Human Resources Statistics Program
National Science Foundation
4201 Wilson Boulevard, Suite 965
Arlington, VA 22230
703-292-7790
sthill@nsf.gov

**NATIONAL SCIENCE FOUNDATION**
ARLINGTON, VA 22230

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