DOCUMENT RESUME

ED 406 208 SE 059 937

AUTHOR Wilkinson, Keith
TITLE Number of Doctoral Scientists and Engineers Grows by 6 Percent between 1993 and 1995.
INSTITUTION National Science Foundation, Arlington, VA. Div. of Science Resources Studies.
REPORT NO NSF-97-305
PUB DATE 13 Mar 97
NOTE 5p.
AVAILABLE FROM National Science Foundation, Division of Science Resources Studies, 4201 Wilson Blvd., Arlington, VA 22230.
PUB TYPE Collected Works - Serials (022) -- Reports - Research/Technical (143)
JOURNAL CIT SRS Data Brief; v1997 n3 Mar 13 1977

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Doctoral Degrees; Employment Patterns; *Employment Statistics; *Engineers; Equal Opportunities (Jobs); Ethnic Groups; Higher Education; *Scientists; Sex Differences; *Statistical Data
IDENTIFIERS National Science Foundation

ABSTRACT

This data brief provides statistical data about the population of scientists and engineers in the United States with doctorates from United States institutions. The report contains data related to the unemployment of scientists and engineers, employment and gender, employment and racial/ethnic identity, and employment in various sectors. The four tables provided are as follows: (1) "Employment Status of Doctoral Scientists and Engineers by Broad Field: 1993 and 1995"; (2) "Doctoral Scientists and Engineers by Employment Status, Sex, and Race/Ethnicity: 1995"; (3) "Employed Doctoral Scientists and Engineers, by Field of Doctorate, Sex and Race/Ethnicity: 1995"; and (4) "Employed Doctoral Scientists and Engineers, by Field of Doctorate and Sector of Employment: 1995." (DDR)

ED 406 208

Science Resources Studies Division

DATA BRIEF

National Science Foundation

Directorate for Social, Behavioral and Economic Sciences

Vol. 1997, No. 3, March 13, 1997

Number of Doctoral Scientists and Engineers Grows by 6 percent between 1993 and 1995

by Keith Wilkinson

At 1.5% in 1995, the unemployment rate for doctoral Scientists and Engineers shows no change from 1993.

In 1995, there were almost 543,000 scientists and engineers (S&Es) in the U.S. with doctoral degrees earned from U.S. institutions. This number is an increase of about 6 percent from 1993. Nearly one-tenth (9.0 percent) of the 1995 total were not in the labor force, i.e., not employed and not seeking employment. These include, amongst others, retirees below the age of 76.

Of the approximately 494,000 doctoral S&Es in the labor force in 1995, about 486,600 (98.5 percent) reported themselves as working for pay or profit. Most of these (84 percent) held degrees in the sciences; 16 percent held doctorates in engineering. About one third (33 percent) of the employed scientists held degrees in the life sciences.

Unemployment

Approximately 1.5 percent of the doctoral S&Es in the labor force were unemployed in 1995, about the same as in 1993. The unemployment rate for the total U.S. labor force in 1995 was 5.6 percent, down from 6.8 percent in 1993. Those with science doctorates showed an unemployment rate of 1.4 percent overall in 1995, compared to 1.8 percent for those with engineering Ph.D.s. Among the sciences, doctorate holders in chemistry (not including biochemistry) showed the highest unemployment rate at 2.2 percent while chemical engineering was the highest among engineering fields at 2.7 percent.

As in 1993, recent Ph.D. graduates (those less than 3 years after graduation) were more likely to be unemployed than their more senior peers—2.0 percent unemployment across all fields in 1995. This rate drops, however, for those who are from 3-5 years beyond their graduation. For example, the unemployment rate for S&Es receiving their Ph.D.s between 1990 and 1992 was 1.4 percent in 1995. Unemployment rates during the working life of most S&Es (those who received their doctorates after 1960) remain below the level of unemployment for new graduates.

Involuntarily Out-of-Field

These low unemployment rates among doctoral S&Es do not necessarily mean that

Table 1. Employment status of doctoral scientists and engineers, by broad field: 1993 and 1995

Field of doctorate	Unemployment rate		IOF rate1/	
	1993	1995	1993	1995
	(Percent)			
Total	1.6	1.5	4.3	4.2
Sciences	1.6	1.4	4.5	4.3
Computer and mathematical sciences	1.1	1.6	3.6	3.8
Life and related sciences	1.5	1.6	3.5	3.4
Physical and related sciences	2.1	1.9	6.1	6.3
Social and related sciences	1.4	0.8	4.4	4.0
Engineering	1.7	1.8	3.6	3.6

1/ The involuntarily out-of-field (IOF) rate shows the ratio to total employment of those who are working part-time but are seeking full-time jobs, or who are working in a non-S&E job when an S&E job would be preferred.

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: NSF/SRS, Survey of Doctorate Recipients, 1995

Electronic Dissemination

SRS data are available through the World Wide Web (http://www.nsf.gov/sbe/srs/stats.htm) For NSF's Telephonic Device for the Deaf, dial 703-306-0090. If you are a user of electronic mail and have access to the internet, you may order publications electronically. Send requests to pubs@nsf.gov. In your request, include the NSF publication number and title, your name, and a complete mailing address.

Table 2. Doctoral scientists and engineers by employment status, sex and race/ethnicity: 1995

Employment status	Total	Male	Female	White	Black	Asian	Hispanic	Native American
Total	542,750	426,110	116,640	452,610	11,310	64,170	12,580	2,010
In labor force								
Working for pay or profit	486,580	381,340	105,240	401,560	10,730	60,540	11,790	1,870
Full-time	458,600	366,010	92,590	376,240	10,280	59,020	11,240	1,770
Part-time	27,980	15,330	12,650	25,320	450	1,520	550	100
Unemployed, seeking	7,330	5,720	1,620	5,840	130	1,070	260	S
Not in labor force								
Retired	39,110	34,900	4,210	37,070	310	1,310	360	60
Not employed, not seeking	9,720	4,140	5,580	8,130	140	1,240	180	S

KEY: S = Estimated value is less than 50--suppressed for reasons of confidentiality and/or data reliability (See NOTE below).

NOTE: All numbers in the table are estimates derived from a sample.
SOURCE: NSF/SRS, Survey of Doctorate Recipients, 1995

In 1995, educational institutions employed just under half of all doctoral S&E's while just over two fifths (41%) were employed in the private sector.

they are all fully employed at work of their own choosing. A rough measure of this phenomenon is provided by the S&E involuntarily out-of-field (IOF) rate. This shows the ratio to total employment of those who are working part-time but are seeking full-time jobs, or who are working in a non-S&E job when an S&E job would be preferred.

The overall S&E IOF rate stood at 4.2 percent in 1995, roughly the same as in 1993. Again, variations by field are apparent, with the physical science doctorates showing the highest IOF rate (6.3 percent) and the life scientists the lowest (3.4 percent), a pattern unchanged from 1993. These numbers continue to support the widespread anecdotal discussions of employment problems among doctoral physicists and geoscientists noted in 1993, but they also put the problems into a perspective of overall employment and involuntarily out-of-field rates.

Employment and Gender

Employed female doctoral S&Es constituted 21.6 percent of all employed doctoral S&Es in 1995, up from 20.2 percent in 1993. Women comprised 24.9 percent of employed scientists and 5.1 percent of employed engineers in 1995, compared to 24.1 percent and 4.3 percent, respectively, in 1993. Thirty-six percent of women scientists reported life sciences as their field of degree in 1995, compared to 34.2 percent in 1993.

Female S&E doctorate holders (86.6 percent) were slightly less likely than their male counterparts (94.6 percent) to be employed full-time in 1995, but much more likely to be employed part-time (men—4.0 percent, women—11.8 percent). An equal proportion of men and women (1.5 percent) reported themselves as not employed, but seeking employment.

Employment and Racial and Ethnic Identity

Asian S&E doctorate holders represented 12.4 percent of all employed doctoral S&Es in 1995, 9.4 percent of scientists and 27.7 percent of engineers. By contrast, blacks, Hispanics and Native Americans collectively represented 5.2 percent of employed doctoral scientists and 4.3 percent of employed doctoral engineers in 1995. Black, Native American and Hispanic doctoral S&Es were more likely to be social scientists than whites. Asian S&E doctorate holders, on the other hand, were more likely to be engineers.

Table 3. Employed doctoral scientists and engineers, by field of doctorate, sex and race/ethnicity: 1995

Field of doctorate	Total	Sex		Race/ethnicity				
		Male	Female	White	Black	Asian	Hispanic	Native American
Total	486,580	381,350	105,240	401,560	10,720	60,550	11,780	1,880
Sciences	406,760	305,570	101,190	347,310	9,520	38,390	9,780	1,670
Computer and mathematical sciences	29,460	25,760	3,700	23,070	430	5,020	830	60
Life and related sciences	132,280	95,800	36,470	113,420	2,740	13,020	2,640	450
Physical and related sciences	101,600	90,590	11,010	84,100	1,230	13,790	2,190	260
Social and related sciences	143,430	93,410	50,020	126,720	5,120	6,560	4,070	900
Engineering	79,830	75,780	4,050	54,260	1,200	22,150	2,010	210

NOTE: All numbers in the table are estimates derived from a sample.
SOURCE: NSF/SRS, Survey of Doctorate Recipients, 1995

Doctorate holders from racial and ethnic minorities were more likely to be employed full-time than their white counterparts in 1995—94.7 percent for Native Americans and blacks, 95.8 percent for Asians, versus 92.4 percent for whites. Minority group doctorate holders were less likely than whites to be employed part-time, and much less likely to be retired, but somewhat more likely to be unemployed.

Employment by Sector

Educational institutions employed over one-half (51.4 percent) of all doctoral scientists and about one-third (32.6 percent) of all Ph.D. engineers in 1995, proportions about the same as in 1993. Doctoral engineers were most likely to be employed in private-for-profit industry. In 1995, private-for-profit (including self-employed) industry employed 57.3 percent of S&Es having their doctorates in engineering fields and 32.2 percent of those with doctorates in the sciences.

Information in this Data Brief is from the 1995 Survey of Doctorate Recipients, conducted by the National Research Council for the National Science Foundation.

For more information contact R. Keith Wilkinson (703) 306-1776, Science and Engineering Personnel Program, Division of Science Resources Studies, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230. For a free copy of Data Briefs, write to the above address, call (703) 306-1773, or send e-mail to pubs@nsf.gov.

Number of Doctoral Scientists and Engineers Grows...—page 4

Table 4. Employed doctoral scientists and engineers, by field of doctorate and sector of employment: 1995

Field of doctorate	Total	Universities and 4-year colleges	Other educational institutions	Private-for-profit	Self-employed	Private not-for-profit	Federal government	State and local government	Other sector
Total	486,580	222,630	12,370	148,450	28,240	23,760	34,930	13,440	2,760
(Percent)	100.0	45.8	2.5	30.5	5.8	4.9	7.2	2.8	0.6
Sciences	406,760	197,030	12,010	104,880	26,090	21,500	29,950	12,730	2,570
(Percent)	100.0	48.4	3.0	25.8	6.4	5.3	7.4	3.1	0.6
Computer and mathematical sciences	29,460	17,920	690	8,030	570	890	1,120	150	90
(Percent)	100.0	60.8	2.3	27.3	1.9	3.0	3.8	0.5	0.3
Life and related sciences	132,280	72,120	2,960	30,870	4,430	6,320	11,780	3,440	380
(Percent)	100.0	54.5	2.2	23.3	3.3	4.8	8.9	2.6	0.3
Physical and related sciences	101,600	38,160	2,370	44,130	2,900	4,170	8,430	1,150	280
(Percent)	100.0	37.6	2.3	43.4	2.9	4.1	8.3	1.1	0.3
Social and related sciences	143,430	68,840	5,990	21,850	18,200	10,120	8,620	7,990	1,830
(Percent)	100.0	48.0	4.2	15.2	12.7	7.1	6.0	5.6	1.3
Engineering	79,830	25,600	370	43,570	2,150	2,250	4,990	710	190
(Percent)	100.0	32.1	0.5	54.6	2.7	2.8	6.3	0.9	0.2

NOTE: All numbers in the table are estimates derived from a sample.

SOURCE: NSF/SRS, Survey of Doctorate Recipients, 1995

NSF 97-305

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☐ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☑ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").