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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 492,000 doctoral S&Es in the labor force in 1995, about 484,800 (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—1.9 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 1.6 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	1.5	3.6	3.7
Life and related sciences	1.5	1.7	3.5	3.4
Physical and related sciences	2.1	1.9	6.1	6.3
Social and related sciences	1.4	0.9	4.4	3.9
Engineering	1.7	1.8	3.6	3.8

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.

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

Employment status	Total	Sex		Race/ethnicity				
		Male	Female	White	Black	Asian	Hispanic	Native American
Total	542,540	425,930	116,610	455,050	11,110	62,430	11,930	1,950
In labor force								
Working for pay or profit	484,780	379,490	105,300	402,600	10,500	58,670	11,110	1,820
Full-time	456,470	363,840	92,630	376,940	10,070	57,170	10,530	1,720
Part-time	28,310	15,650	12,670	25,660	430	1,500	580	100
Unemployed, seeking	7,340	5,720	1,610	5,860	130	1,080	240	S
Not in labor force								
Retired	40,570	36,480	4,090	38,260	330	1,500	420	60
Not employed, not seeking	9,860	4,250	5,610	8,330	150	1,190	160	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 21.7 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 (94.5 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 12.1 percent of all employed doctoral S&Es in 1995, 9.2 percent of scientists and 27.1 percent of engineers. By contrast, blacks, Hispanics and Native Americans collectively represented 5.0 percent of employed doctoral scientists and 3.8 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 2. Doctoral scientists and engineers by employment status, sex and race/ethnicity: 1995

Employment status	Total	Sex		Race/ethnicity				
		Male	Female	White	Black	Asian	Hispanic	Native American
Total	542,540	425,930	116,610	455,050	11,110	62,430	11,930	1,950
In labor force								
Working for pay or profit	484,780	379,490	105,300	402,600	10,500	58,670	11,110	1,820
Full-time	456,470	363,840	92,630	376,940	10,070	57,170	10,530	1,720
Part-time	28,310	15,650	12,670	25,660	430	1,500	580	100
Unemployed, seeking	7,340	5,720	1,610	5,860	130	1,080	240	S
Not in labor force								
Retired	40,570	36,480	4,090	38,260	330	1,500	420	60
Not employed, not seeking	9,860	4,250	5,610	8,330	150	1,190	160	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

Doctorate holders from racial and ethnic minorities were more likely to be employed full-time than their white counterparts in 1995—94.5 percent for Native Americans, 94.7 for blacks, and 95.7 percent for Asians, versus 92.3 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 (51.5 percent) of all doctoral scientists and about one-third (33.1 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 56.9 percent of S&Es having their doctorates in engineering fields and 32.1 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.

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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	484,780	222,530	12,410	146,720	28,550	23,840	34,650	13,330	2,750
(Percent)	100.0	45.9	2.6	30.3	5.9	4.9	7.1	2.7	0.6
Sciences	406,130	196,870	12,040	104,430	26,140	21,580	29,820	12,690	2,570
(Percent)	100.0	48.5	3.0	25.7	6.4	5.3	7.3	3.1	0.6
Computer and mathematical sciences	29,250	17,830	690	7,940	570	880	1,100	150	90
(Percent)	100.0	61.0	2.4	27.1	1.9	3.0	3.8	0.5	0.3
Life and related sciences	132,190	72,120	2,970	30,800	4,430	6,330	11,740	3,420	380
(Percent)	100.0	54.6	2.2	23.3	3.4	4.8	8.9	2.6	0.3
Physical and related sciences	101,300	38,290	2,380	43,790	2,910	4,110	8,390	1,150	280
(Percent)	100.0	37.8	2.3	43.2	2.9	4.1	8.3	1.1	0.3
Social and related sciences	143,390	68,630	6,010	21,900	18,230	10,250	8,580	7,970	1,820
(Percent)	100.0	47.9	4.2	15.3	12.7	7.1	6.0	5.6	1.3
Engineering	78,650	25,660	370	42,300	2,410	2,270	4,830	630	180
(Percent)	100.0	32.6	0.5	53.8	3.1	2.9	6.1	0.8	0.2

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

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

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