

## MORE THAN ONE-FIFTH OF ALL INDIVIDUALS EMPLOYED IN SCIENCE AND ENGINEERING OCCUPATIONS HAVE LESS THAN A BACHELOR'S DEGREE EDUCATION

by John Tsapogas

More than four million individuals with at least a high school education were employed in science and engineering (S&E) occupations in the United States as of April 2003. Within this group, a substantial proportion, 22 percent, reported either a high school diploma (5 percent) or an associate's degree (17 percent) as their highest level of educational attainment (table 1).

Among the remaining proportion, 48 percent held a bachelor's degree, about 22 percent held a master's degree, 7 percent held a doctorate, and about 2 percent held a professional degree.

The occupational and demographic characteristics of individuals who have been successful in obtaining em-

TABLE 1. Persons employed in S&E occupations by highest degree, sex, race/ethnicity, and occupational group: April 2003

| Characteristic            | Total     | Occupational group                       |                             |                                 |                               |                            |
|---------------------------|-----------|--|-----------------------------|---------------------------------|-------------------------------|----------------------------|
|                           |           | Computer and math<br>science occupations | Life science<br>occupations | Physical science<br>occupations | Social science<br>occupations | Engineering<br>occupations |
| Total                     | 4,682,400 | 1,146,300                                | 295,400                     | 380,900                         | 363,600                       | 2,496,100                  |
| Highest degree            |           |  |                             |                                 |                               |                            |
| Professional <sup>1</sup> | 91,100*   | 5,900**                                  | 23,500**                    | 13,900**                        | 26,900**                      | 20,700**                   |
| Doctorate                 | 318,100   | 10,100*                                  | 71,100*                     | 91,700*                         | 88,100*                       | 57,000*                    |
| Master's                  | 1,008,200 | 177,200                                  | 65,500*                     | 103,900*                        | 104,100*                      | 557,600                    |
| Bachelor's                | 2,228,800 | 498,900                                  | 106,300*                    | 146,600*                        | 109,100*                      | 1,367,900                  |
| Associate's               | 811,000   | 369,800                                  | 22,200**                    | 16,900**                        | 27,900**                      | 374,200                    |
| High school diploma       | 225,200*  | 84,400*                                  | 6,800**                     | 7,900**                         | 7,500**                       | 118,700*                   |
| Sex                       |           |  |                             |                                 |                               |                            |
| Female                    | 1,094,900 | 308,000                                  | 108,900*                    | 153,700*                        | 195,600*                      | 328,800*                   |
| Male                      | 3,587,500 | 838,300                                  | 186,500*                    | 227,200*                        | 168,000*                      | 2,167,300                  |
| Race/ethnicity            |           |  |                             |                                 |                               |                            |
| Asian                     | 645,700   | 116,500*                                 | 38,800**                    | 79,200**                        | 7,200**                       | 403,900*                   |
| Black                     | 247,100*  | 108,000*                                 | 9,400**                     | 11,800**                        | 24,000**                      | 94,000*                    |
| Hispanic                  | 185,600*  | 60,200**                                 | 16,600**                    | 10,700**                        | 24,800**                      | 73,400*                    |
| White                     | 3,552,500 | 853,300                                  | 226,900*                    | 270,800*                        | 300,700                       | 1,900,800                  |
| Other                     | 51,500**  | 8,300**                                  | 3,700**                     | 8,400**                         | 6,900**                       | 24,000**                   |

\*Relative standard error greater than 10 percent.

\*\*Relative standard error greater than 25 percent.

<sup>1</sup> Includes law degrees and doctoral degrees in dentistry, medicine, and theology.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, and U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, April 2003 Current Population Survey.



ployment in S&E occupations with the academic credentials of an associate's degree or a high school diploma are examined here. Within this group, 78 percent had an associate's degree as their highest degree,<sup>1</sup> and the remaining 22 percent had a high school diploma but not a college degree.

Data included in this report are from the April 2003 Current Population Survey (CPS) file. See "Data Notes," below, for more detail.

### Occupational Groups

Significant numbers of individuals employed in computer and math science occupations and engineering occupations have high school diplomas or associate's degrees but no higher college degrees (table 2). Approximately 40 percent of all individuals employed in computer and math science occupations and 20 percent of all individuals employed in engineering occupations have no higher than an associate's degree. The three other major occupational groups examined, life science occupations, physical science occupations, and social science occupations, have substantially smaller proportions (10 percent or less) of individuals with less than a bachelor's degree education.

### Demographic Characteristics

#### Sex

As of April 2003, 806,700 men and 229,500 women employed in S&E occupations in the United States had less than a bachelor's degree education (table 3). The pro-

TABLE 2. Persons employed in S&E occupations, by occupational group and highest educational attainment: April 2003

| Occupational group                    | Total     | High school diploma or associate's degree |         |
|---------------------------------------|-----------|---|---------|
|                                       |           | Number                                    | Percent |
| Total                                 | 4,682,400 | 1,036,200                                 | 22      |
| Computer and math science occupations | 1,146,300 | 454,200                                   | 40      |
| Life science occupations              | 295,400   | 29,000*                                   | 10      |
| Physical science occupations          | 380,900   | 24,800*                                   | 7       |
| Social science occupations            | 363,600   | 35,300*                                   | 10      |
| Engineering occupations               | 2,496,100 | 492,900                                   | 20      |

\*Relative standard error greater than 10 percent.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, and U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, April 2003 Current Population Survey.

<sup>1</sup>Throughout this report, the highest degree earned is used to determine an individual's level of education.

TABLE 3. Persons employed in S&E occupations whose highest educational attainment is a high school diploma or an associate's degree, by education, sex, and race/ethnicity: April 2003

| Characteristic      | Total     | Science occupations | Engineering occupations |
|---------------------|-----------|---------------------|-------------------------|
| Total               | 1,036,200 | 543,300             | 492,900                 |
| Education           |           |                     |                         |
| Associate's degree  | 811,000   | 436,800             | 374,200                 |
| High school diploma | 225,200*  | 106,500*            | 118,700*                |
| Sex                 |           |                     |                         |
| Female              | 229,500   | 174,400             | 55,100                  |
| Male                | 806,700   | 368,900             | 437,800                 |
| Race/ethnicity      |           |                     |                         |
| Asian               | 40,300*   | 10,900**            | 29,400*                 |
| Black               | 84,200*   | 61,400*             | 22,800**                |
| Hispanic            | 69,000*   | 42,300*             | 26,700**                |
| White               | 821,000   | 415,800             | 405,200                 |
| Other               | 21,700**  | na                  | na                      |

\*Relative standard error is greater than 10 percent.

\*\*Relative standard error is greater than 25 percent.

na = not available, unweighted cell size is zero or is too small to report.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, and U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, April 2003 Current Population Survey.

portion of individuals employed in S&E occupations with less than a bachelor's degree education is similar for men and women—slightly more than one-fifth (table 4). This ratio does not vary widely across S&E occupations: whether employed in science occupations or engineering occupations, women are as likely as men to have less than a bachelor's degree education. When examined by broad occupational group, approximately one-quarter of the men and about the same proportion of the women employed in science occupations in the U.S. workforce had less than a bachelor's degree education. Approximately one-fifth of the men and a similar proportion of the women employed in engineering occupations in the U.S. workforce had less than a bachelor's degree education.

#### Race/ethnicity

The percentage of those with less than a bachelor's degree education in all S&E occupations combined varies by race/ethnicity, ranging from 6 percent for Asian/Pacific Islanders to 34 percent for blacks and 37 percent for Hispanics (table 4). The lowest percentages of individuals employed with less than a bachelor's degree education were Asian/Pacific Islanders.

TABLE 4. Persons employed in S&E occupations whose highest educational attainment is a high school diploma or an associate's degree, by sex and race/ethnicity: April 2003

(Percent)

| Characteristic | Total | Science occupations | Engineering occupations |
|----------------|-------|---------------------|-------------------------|
| Total          | 22    | 25                  | 20                      |
| Sex            |       |                     |                         |
| Female         | 21*   | 23*                 | 17*                     |
| Male           | 22    | 26                  | 20                      |
| Race/ethnicity |       |                     |                         |
| Asian          | 6*    | 5**                 | 7*                      |
| Black          | 34*   | 40*                 | 24**                    |
| Hispanic       | 37*   | 38*                 | 36**                    |
| White          | 23    | 25                  | 21                      |
| Other          | 42**  | na                  | na                      |

\*Relative standard error is greater than 10 percent.

\*\*Relative standard error is greater than 25 percent.

na = not available, unweighted cell size is zero or is too small to report.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, and U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, April 2003 Current Population Survey.

## Conclusion

The S&E workforce of the United States depends heavily on graduates with at least a 4-year college education; however, individuals employed in S&E occupations with associate's degrees and high school diplomas represent a significant portion of this workforce and account for over one-fifth of all persons employed in U.S. science and engineering occupations.

## Data Notes

This *Infobrief* demonstrates the use of the CPS as a resource for addressing questions on the educational

attainment of the S&E workforce, especially for those individuals with high school diplomas and associate's degrees. The CPS file was used to create a subset of individuals who were 75 years of age or younger, were employed principally in science or engineering occupations, and had completed a high school diploma or above. The Bureau of the Census conducts the CPS for the Bureau of Labor Statistics (for more information on the CPS, see <http://www.bls.census.gov/cps/cpsmain.htm>).

Results of a study conducted at the National Science Foundation that examined the usefulness and comparability of estimates of the S&E workforce at all educational levels are in the forthcoming report "A Comparison of the National Science Foundation's Scientists and Engineers Statistical Data System (SESTAT) with the Bureau of Labor Statistics Current Population Survey (CPS)," which will be available at <http://www.nsf.gov/sbe/srs/special.htm>.

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