



Characteristics of Individuals Educated or Employed as Engineers

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Diversity in the Minerals, Metals, and Materials Professions
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National Science Foundation
National Center for Science and Engineering Statistics
www.nsf.gov/statistics

NCSES: A federal statistical agency within NSF

Mission

Responsible for statistical data on:

- Research and development.
- The science and engineering workforce.
- U.S. competitiveness in science and engineering.
- The condition and progress of science, technology, engineering and mathematics (STEM) education in the United States.

Publications and products

- Special analytic reports.
- InfoBriefs.
- Detailed statistical tables.
- Working papers designed to further exploration and discussion of a topic.



Women, Minorities, & Persons with Disabilities in S&E (WMPD)

Comprehensive look at women, minorities, and persons with disabilities in S&E education and employment by field and occupation.

Statistical abstract: no policy or program recommendations.

NCSES and other federal surveys used to explore 4 topical areas:

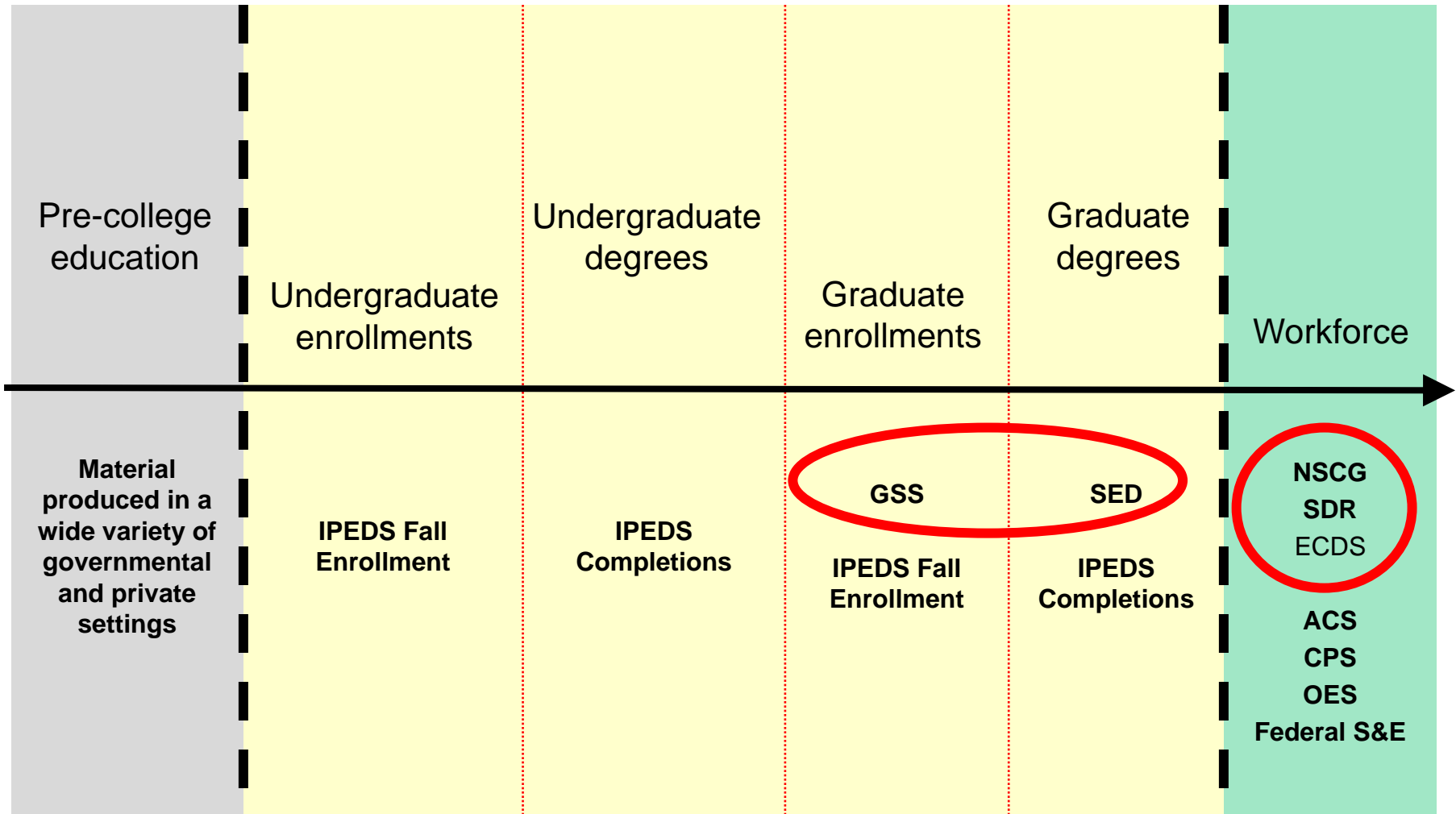
- Enrollment
- Field of degree
- Occupation
- Employment status

Data are nuanced due to important field and occupation differences.

Bottom lines:

- Women equal to men in S&E degree attainment; a smaller presence in S&E occupations.
- Blacks, Hispanics, and American Indians or Alaska Natives underrepresented in both educational attainment and S&E workforce.
- Persons with disabilities more likely to be unemployed or not in the labor force.

Scope of human resources data



What is an “underrepresented minority?”

Blacks, Hispanics and Native Americans are underrepresented across science and engineering. Combined, those groups make up 31% of the U.S. population. That share is lower at various levels of S&E.

U.S. general population

31%



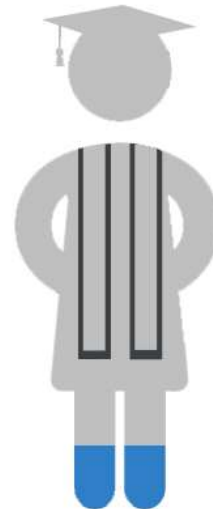
S&E bachelor's recipients

21%



S&E doctorate recipients

13%



Employment in S&E occupations

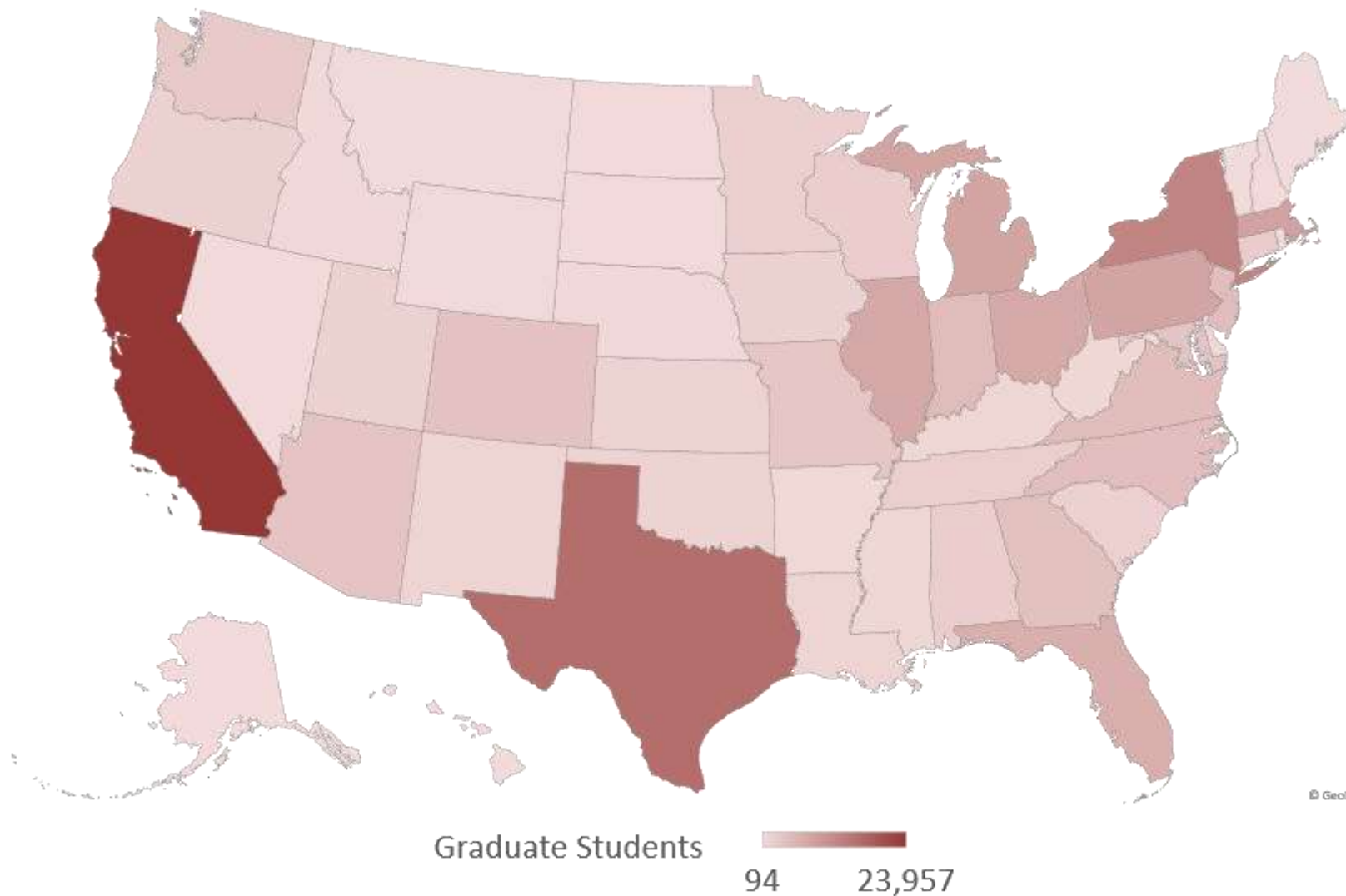
11%



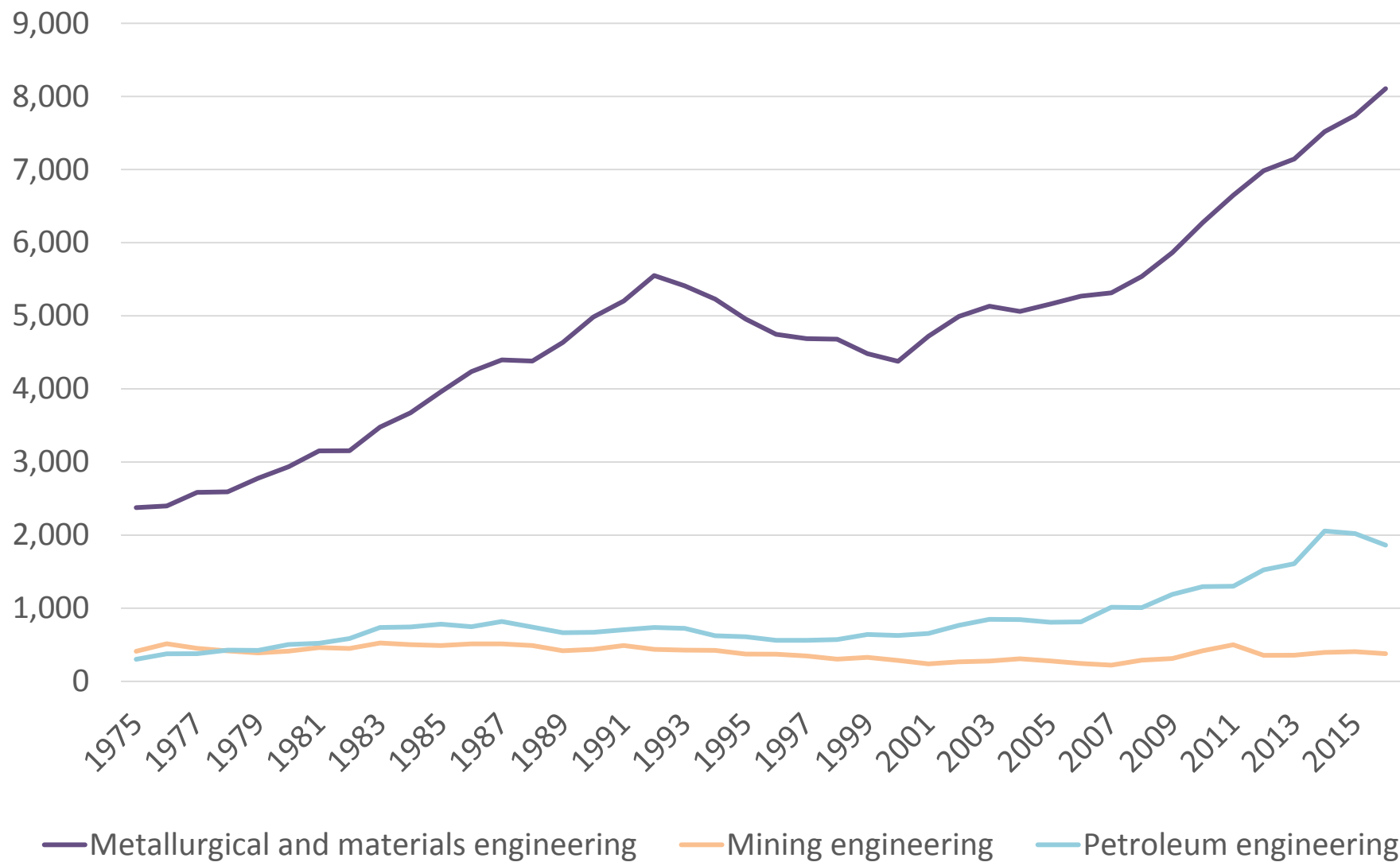
Sources: 2014 American Community Survey (population); National Center for Education Statistics degree completion data (bachelor's and doctorate recipients); 2015 National Survey of College Graduates (employment)

Graduate School Enrollments

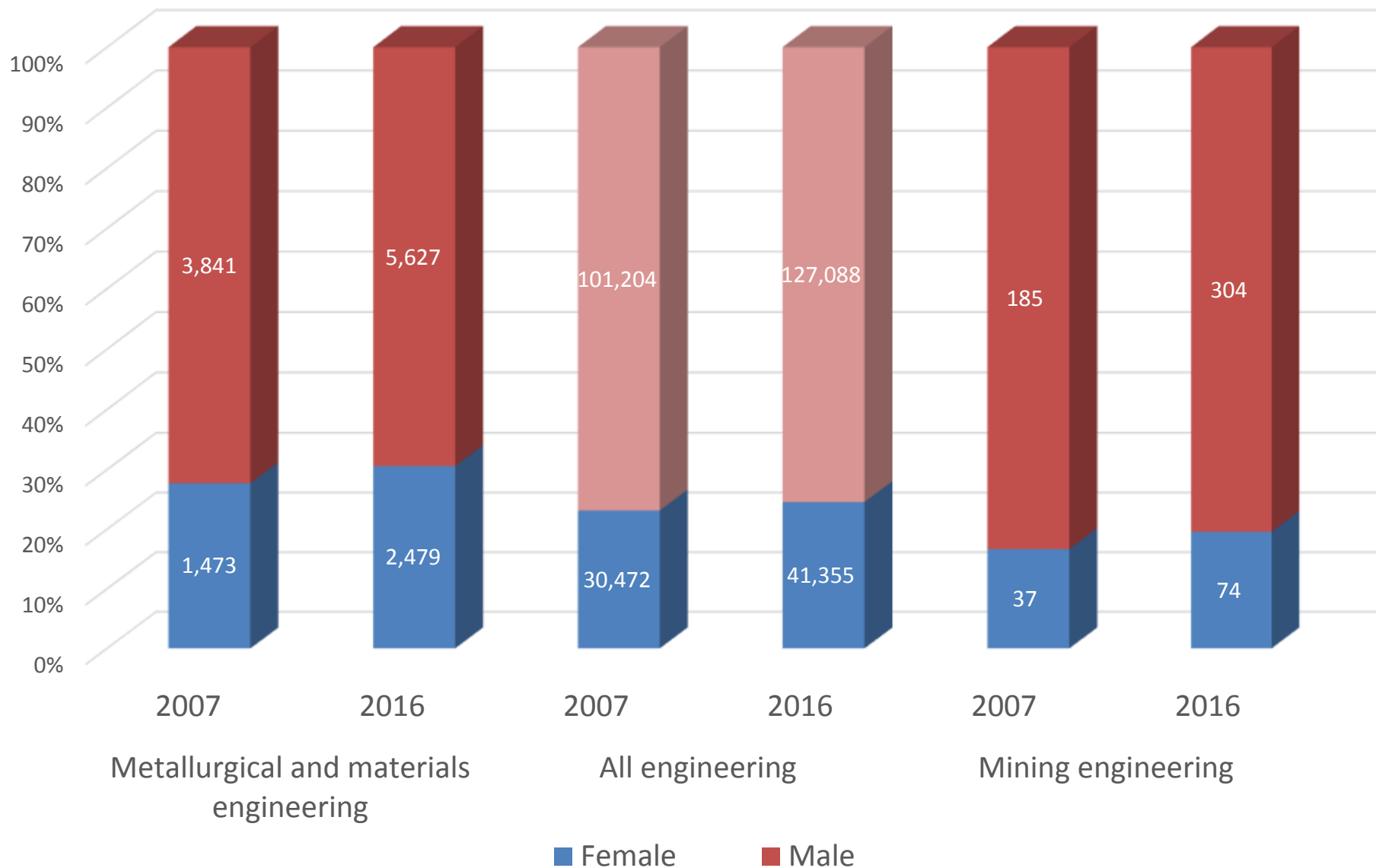
Total number of graduate students enrolled in engineering: 2016



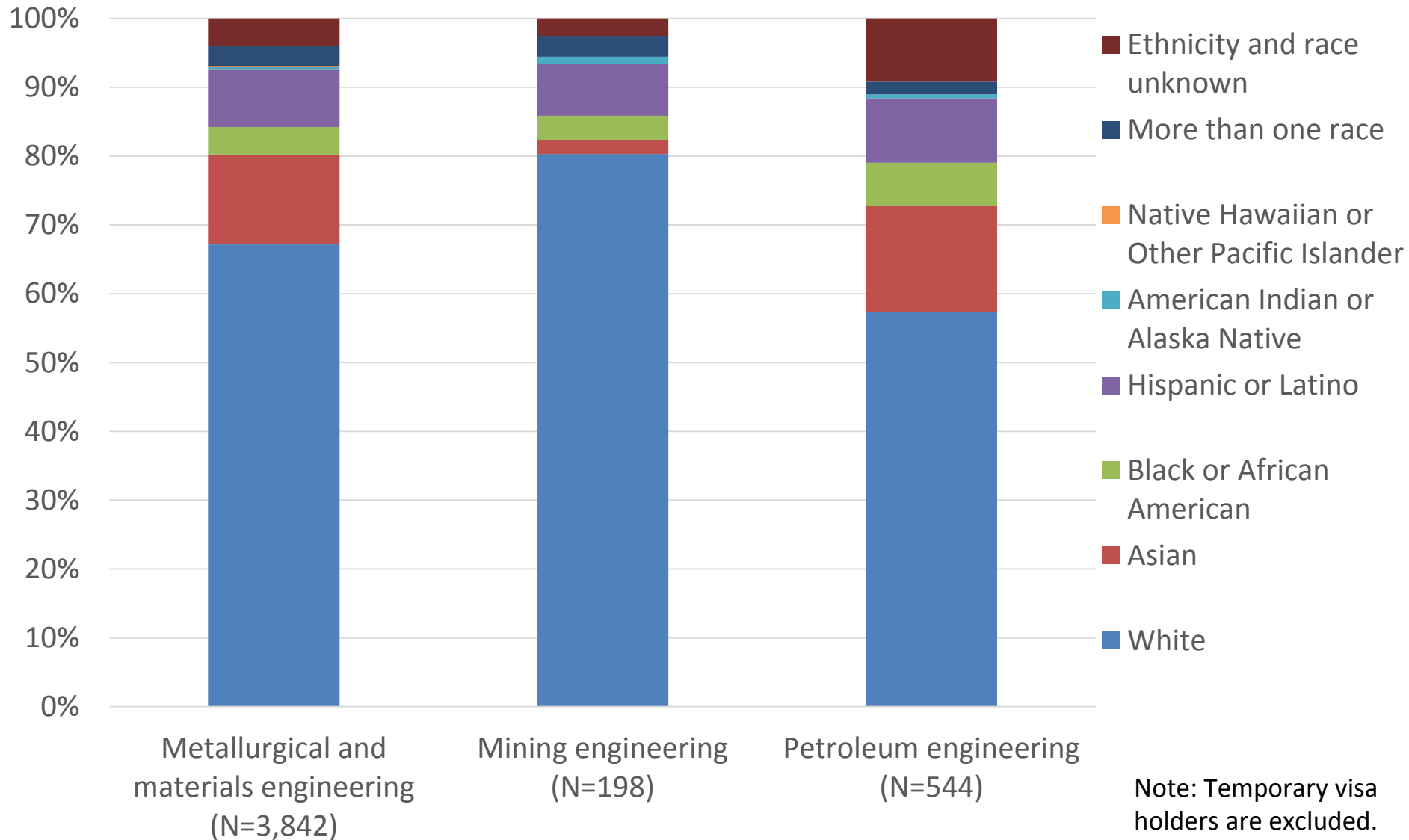
Number of graduate students enrolled in metallurgical & materials engineering, mining engineering, and petroleum engineering: 1975-2016



Sex of graduate students enrolled in engineering: 2007 & 2016



Race and ethnicity of graduate students enrolled in engineering: 2016



Educational Degrees

Information on Bachelor's Degrees

Field of degree: Women

2014: High participation



Psychology

77% of bachelor's degrees
79% of master's degrees
73% of doctorate degrees



Biosciences

58% of bachelor's degrees
57% of master's degrees
53% of doctorate degrees



Social Sciences

55% of bachelor's degrees
57% of master's degrees
51% of doctorate degrees

2014: Low participation



Economics

31% of bachelor's degrees
41% of master's degrees
34% of doctorate degrees



Computer Sciences

18% of bachelor's degrees
29% of master's degrees
21% of doctorate degrees



Physics

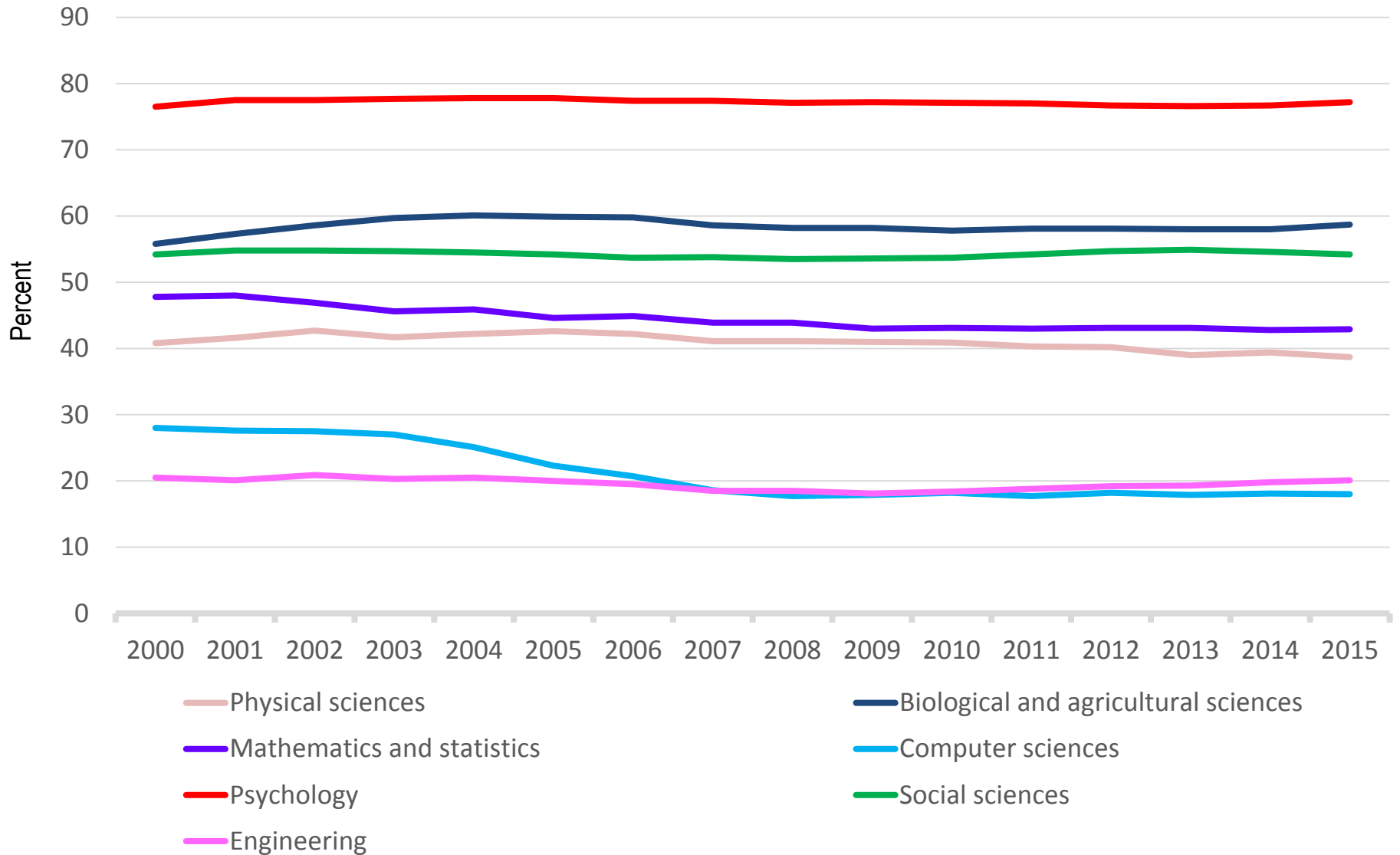
19% of bachelor's degrees
23% of master's degrees
19% of doctorate degrees



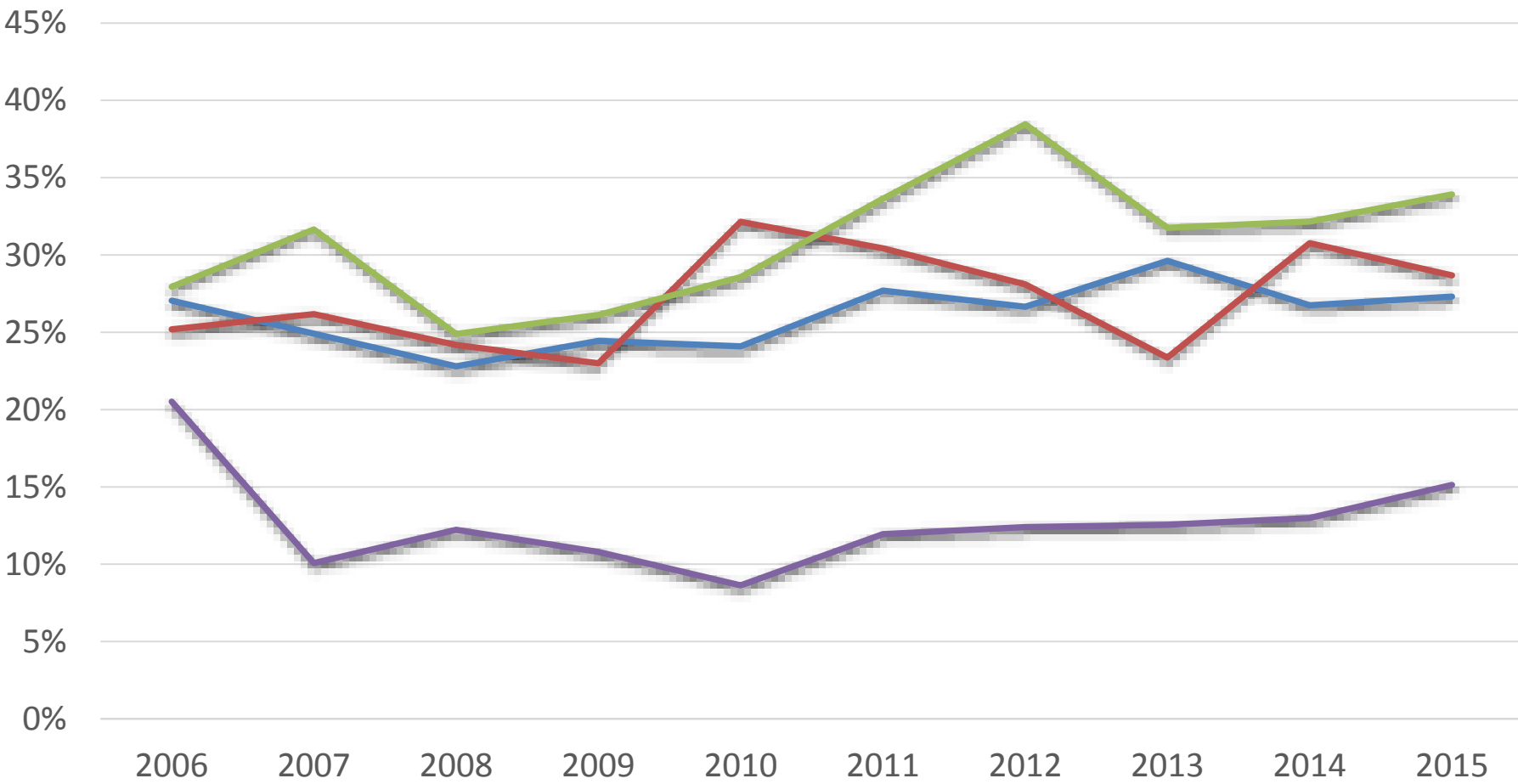
Engineering

20% of bachelor's degrees
24% of master's degrees
23% of doctorate degrees

Women's share of S&E bachelor's degrees, by field: 2000–2015



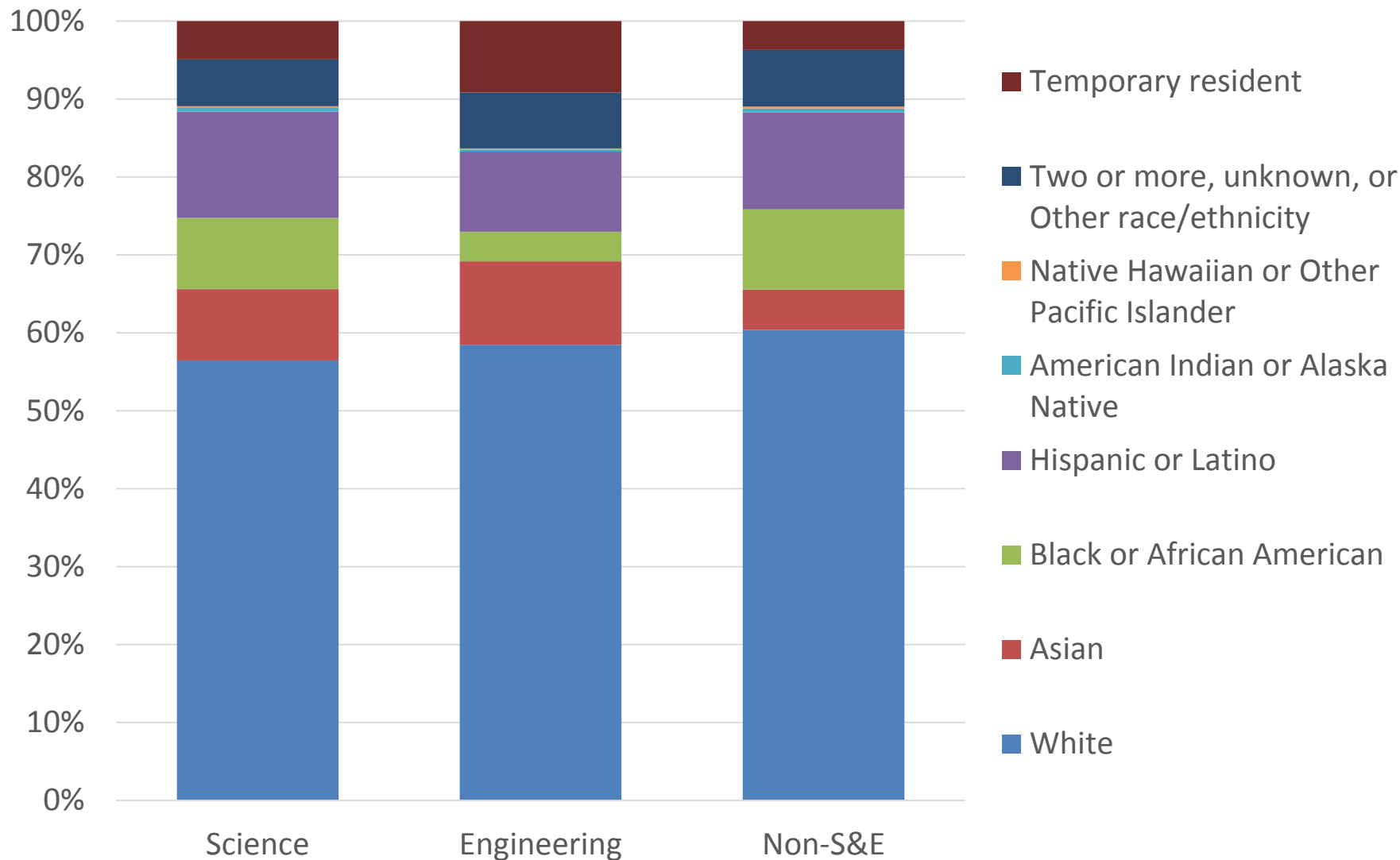
Women's share of engineering bachelor's degrees, by subfield: 2006–2015



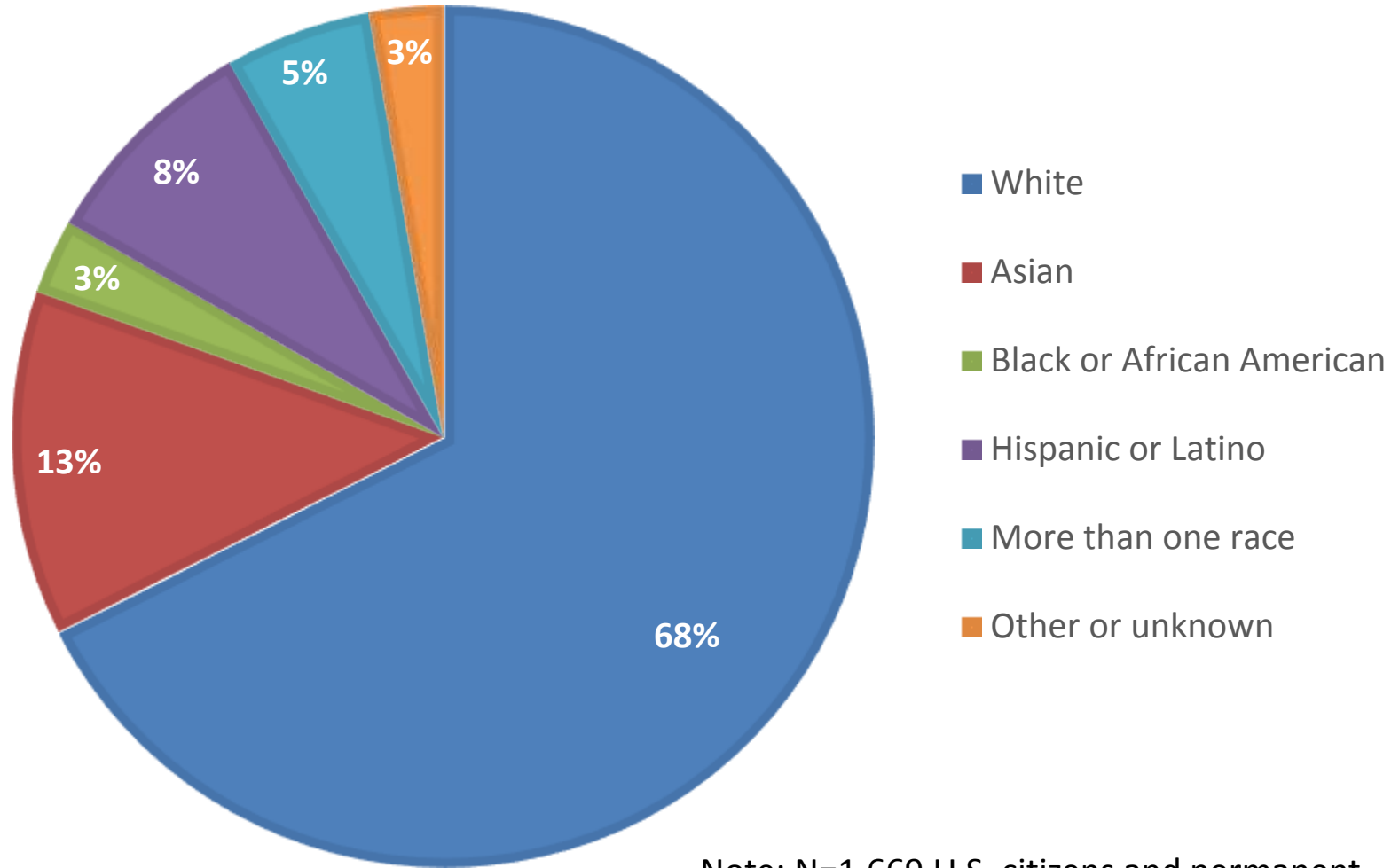
- Materials Engineering
- Metallurgical Engineering
- Materials Science
- Mining and Mineral Engineering



Bachelor's degrees awarded in science, engineering, and non-S&E fields by race and ethnicity: 2016

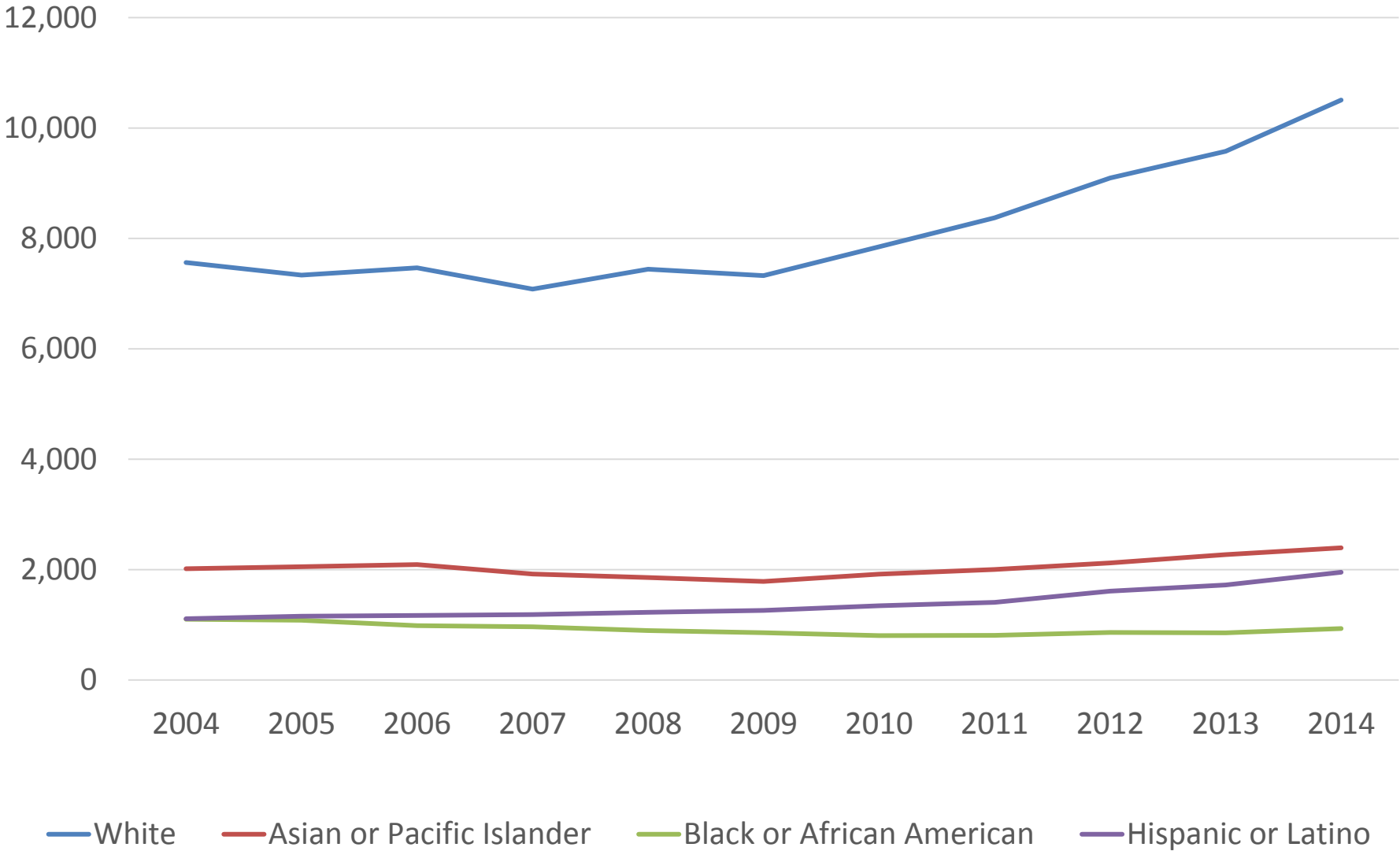


Bachelor's degrees awarded in materials engineering, by race and ethnicity: 2016



Note: N=1,669 U.S. citizens and permanent residents; 222 temporary visa holders are excluded.

Engineering bachelor's degrees earned by women, by race and ethnicity: 2004-2014

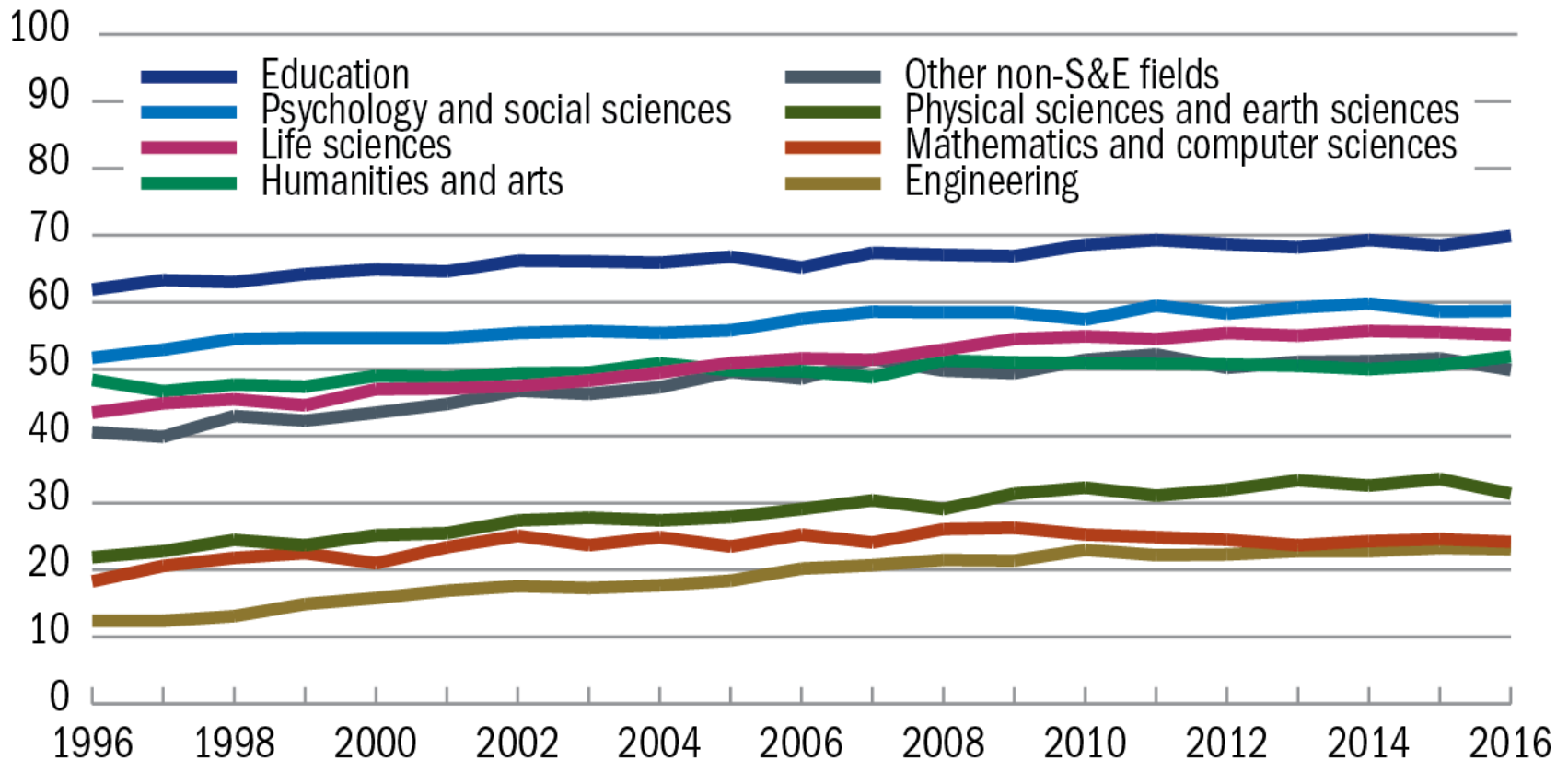


Educational Degrees

Information on Doctoral Degrees

Share of doctorates awarded to women, by broad field of study: 1996–2016

Percent of each field

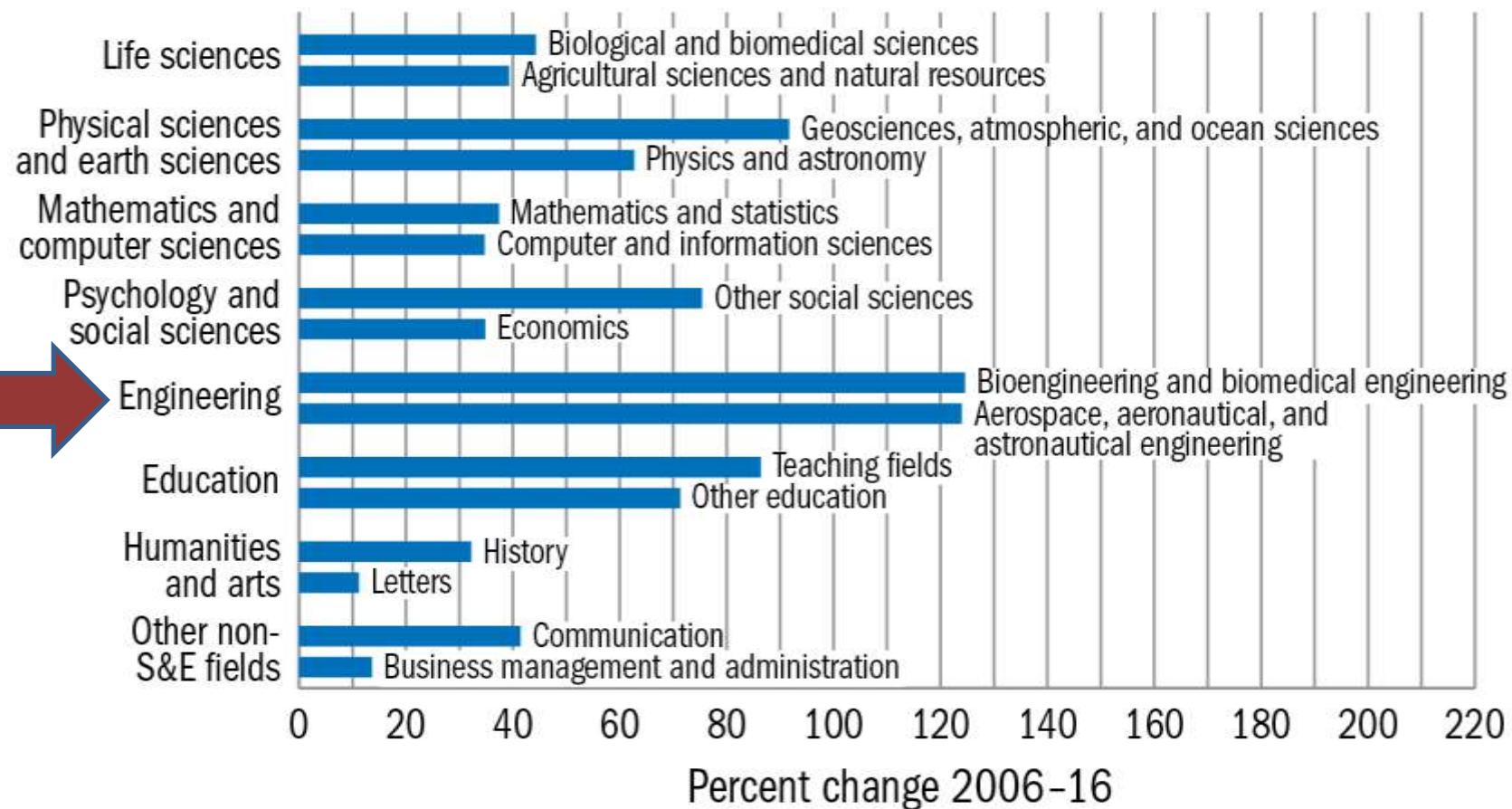


S&E = science and engineering.

NOTE: Percentages are based on the number of doctorate recipients for whom sex was reported.

SOURCE: *Doctorate Recipients from U.S. Universities 2016*. Related detailed data: tables 14, 15, 16.

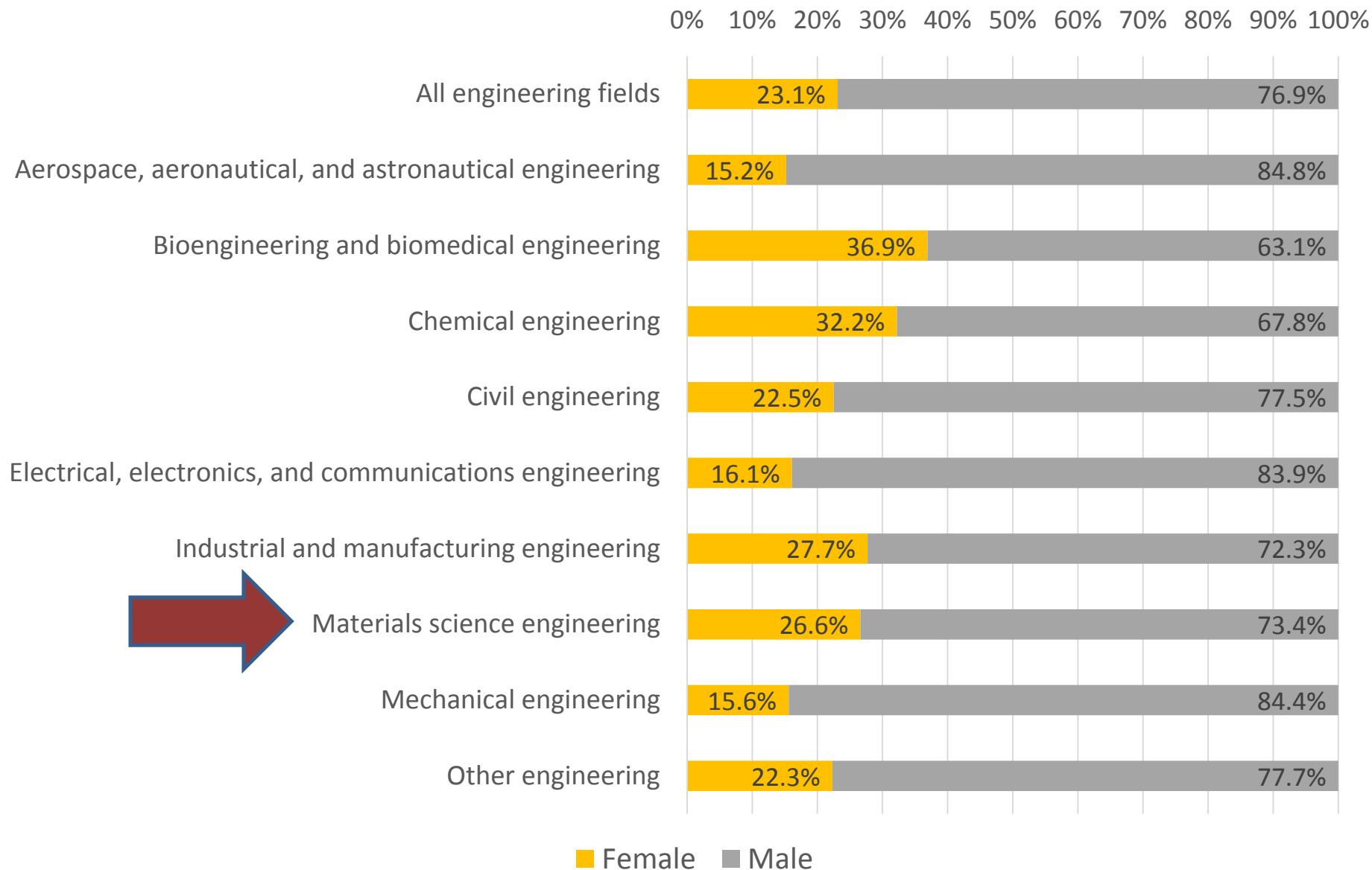
Fastest growing fields of study for female U.S. doctorate recipients, by broad field of study: 2006-16



S&E = science and engineering.

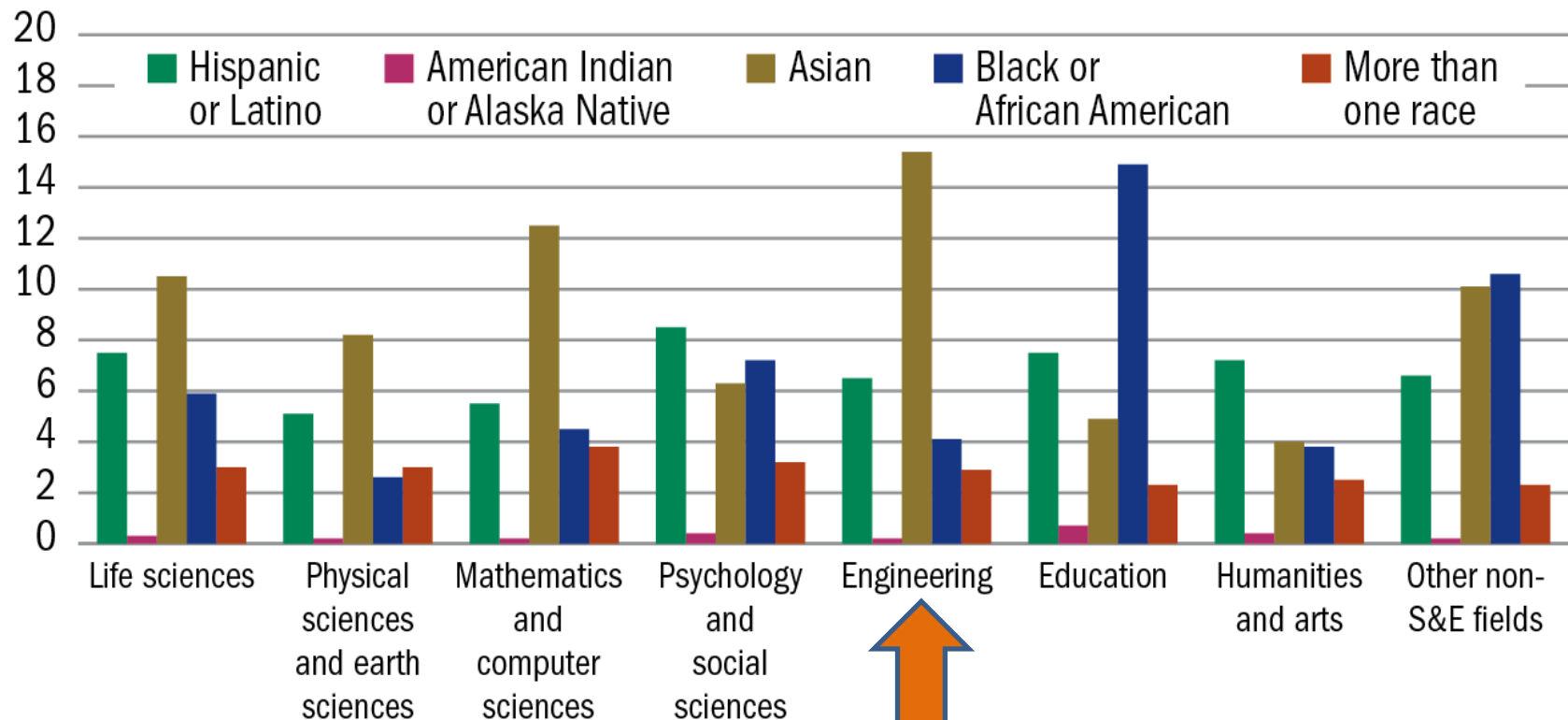
SOURCE: *Doctorate Recipients from U.S. Universities 2016*. Related detailed data: table 15.

Doctorate recipients in engineering fields, by sex: 2016



Doctorates awarded to minority U.S. citizens and permanent residents, by ethnicity, race, and broad field of study: 2016

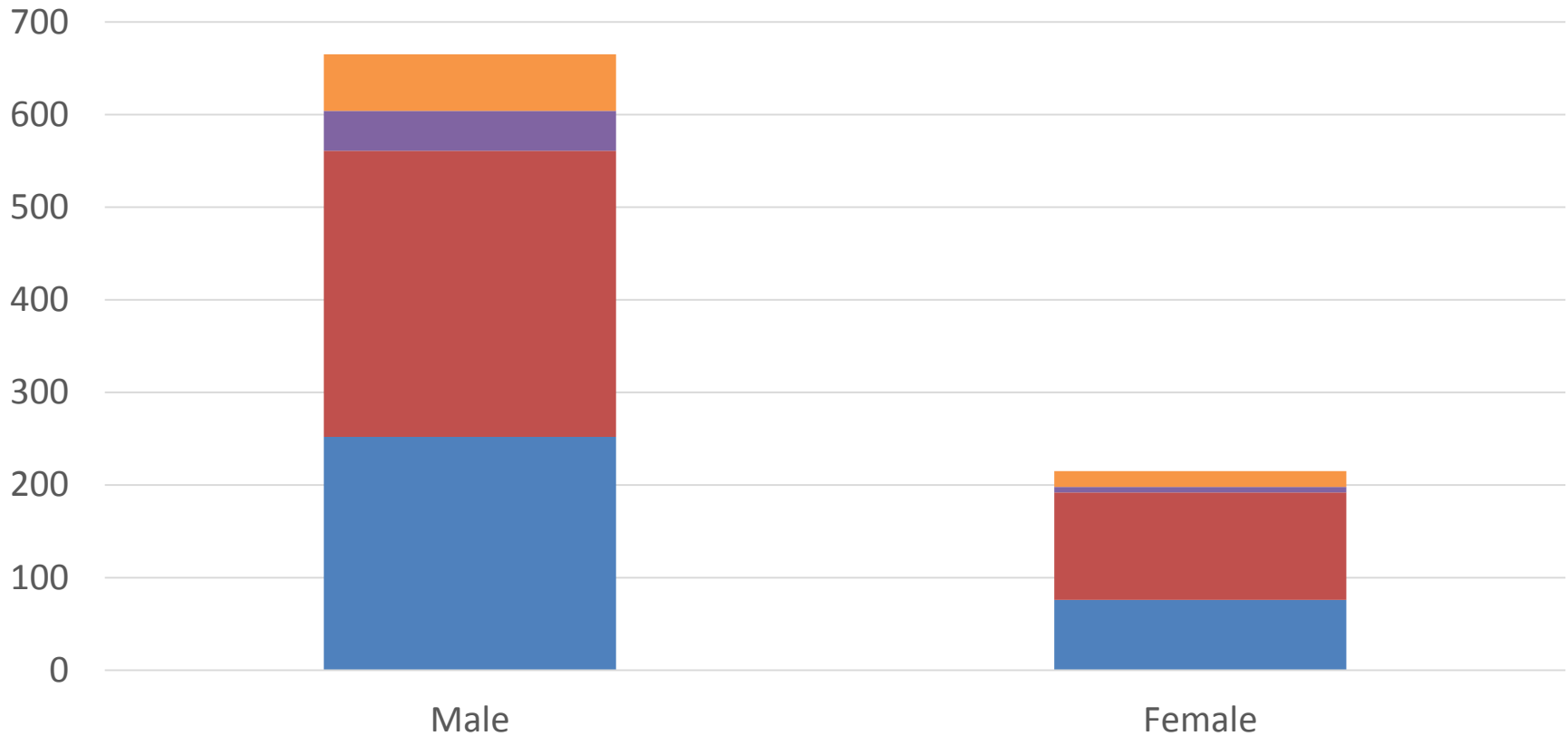
Percent



S&E = science and engineering.

SOURCE: *Doctorate Recipients from U.S. Universities 2016*. Related detailed data: tables 23, 24.

Doctoral degrees awarded in materials engineering, by sex and race and ethnicity: 2015



- White
- Black or African American*
- More than one race*
- Asian
- Hispanic or Latino
- Other or unknown

Note: Temporary visa holders are included.
*Suppressed to avoid disclosure of confidential information.

Occupation

Occupation and employment status of scientists and engineers

Scientists and Engineers are...

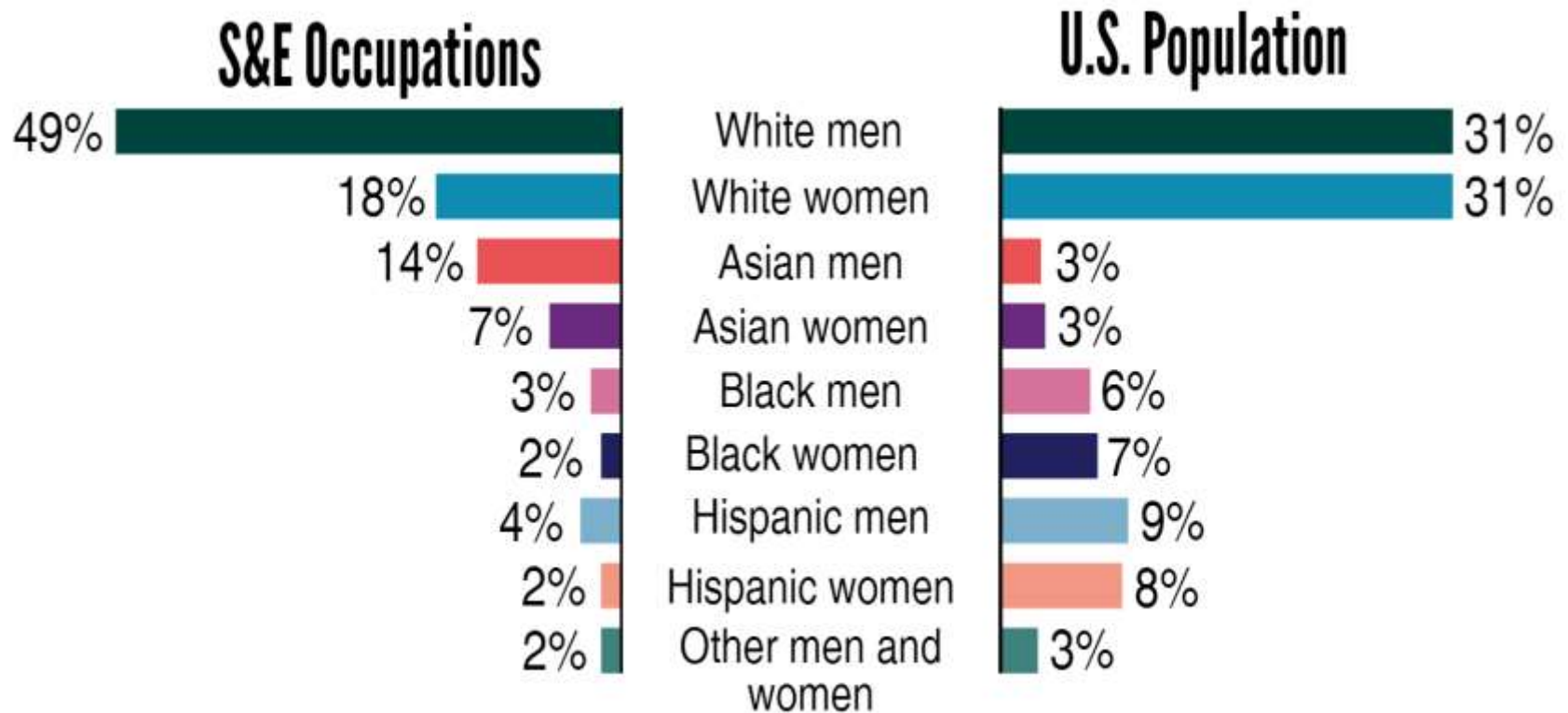
College graduates with...

- At least one degree in an S&E or S&E-related field

OR

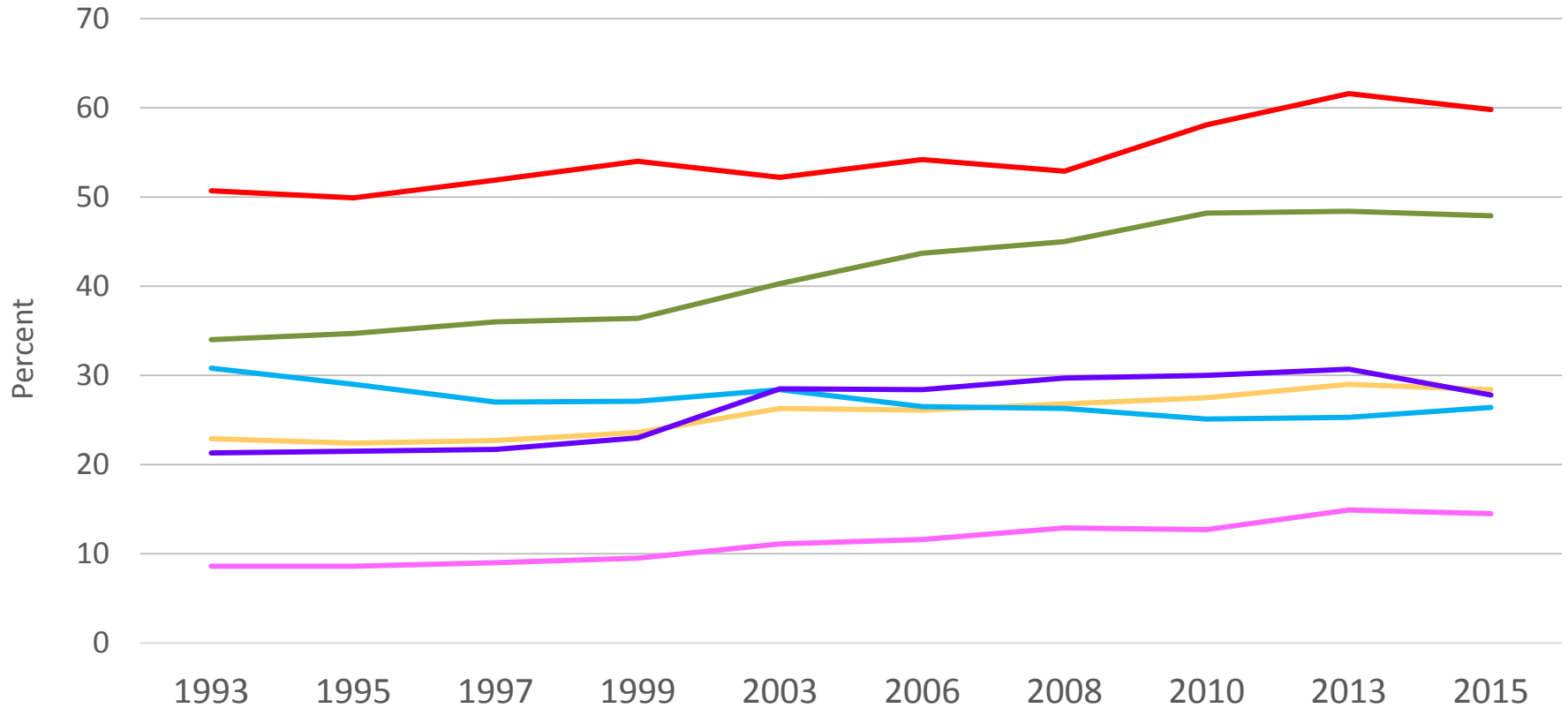
- Working in an S&E or S&E-related occupation

Comparing scientists and engineers in S&E occupations with the U.S. population



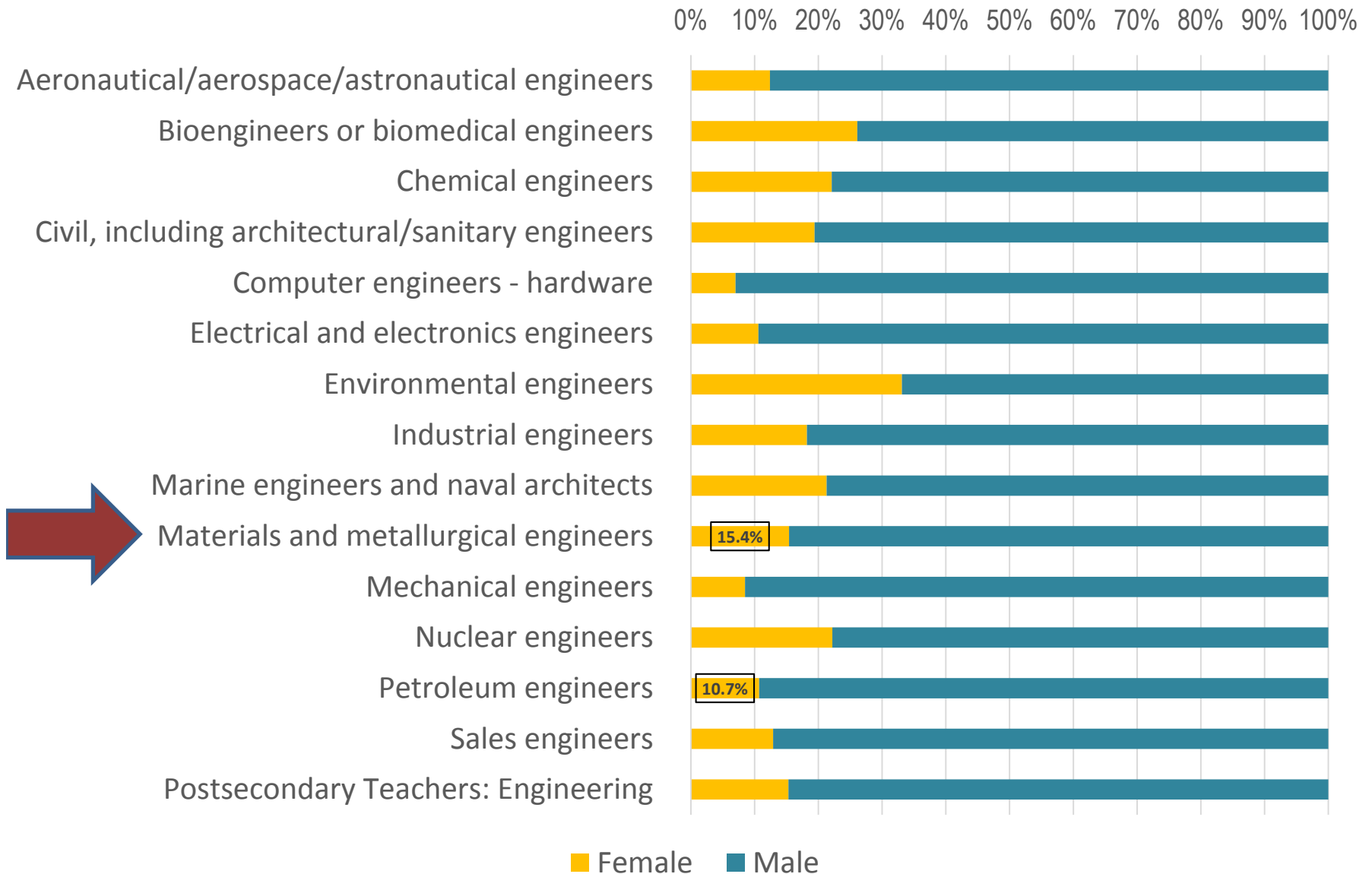
NOTES: Hispanic may be any race. Other includes individuals not of Hispanic ethnicity who reported more than one race or a race not listed separately.

Women in S&E occupations: 1993-2015

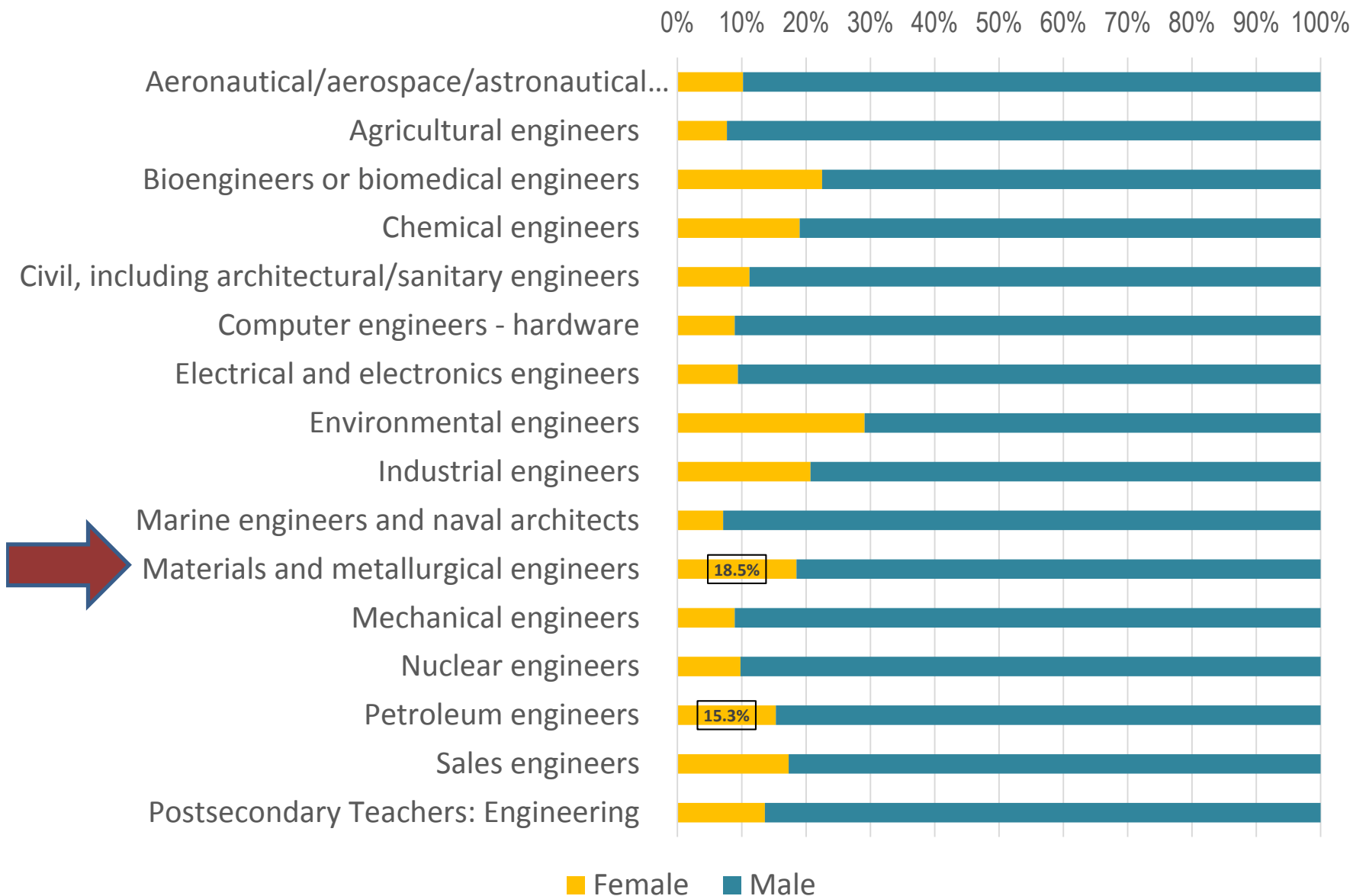


- All S&E occupations
- Computer and mathematical scientists
- Biological, agricultural, and environmental life scientists
- Physical scientists
- Social scientists
- Engineers

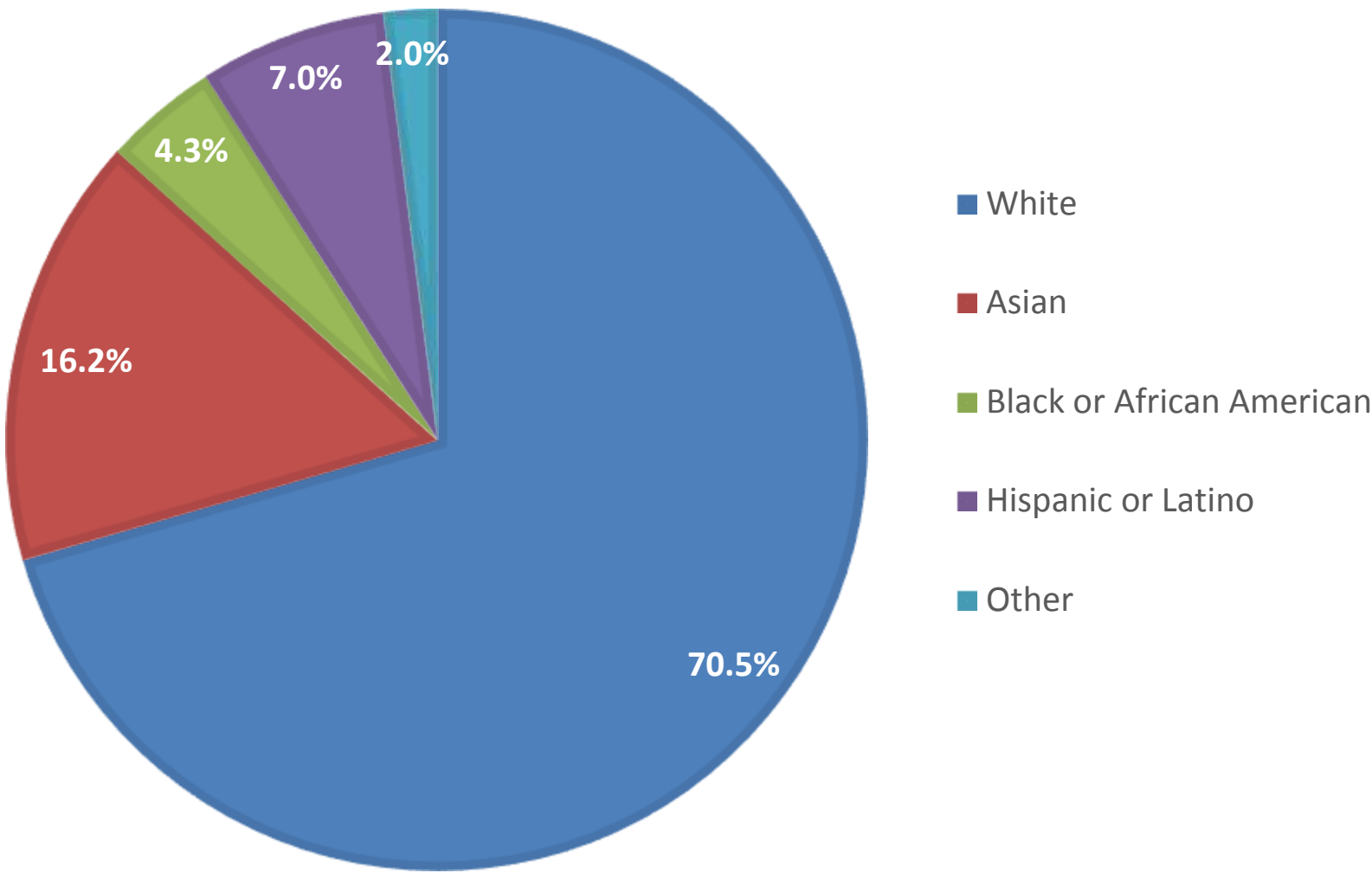
Percentage of women in engineering jobs: 2015



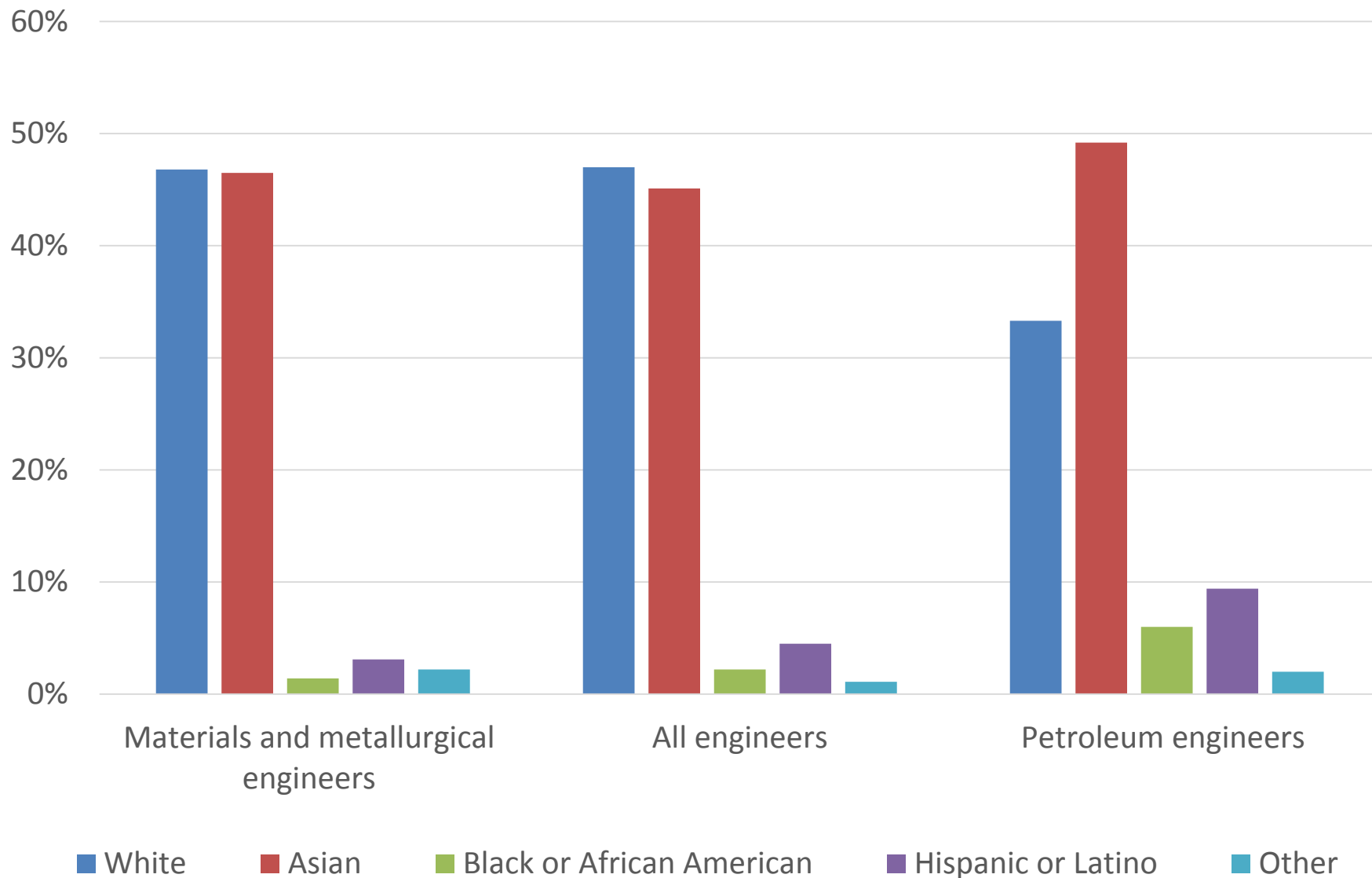
Among doctorate recipients, percentage of females in engineering jobs: 2015



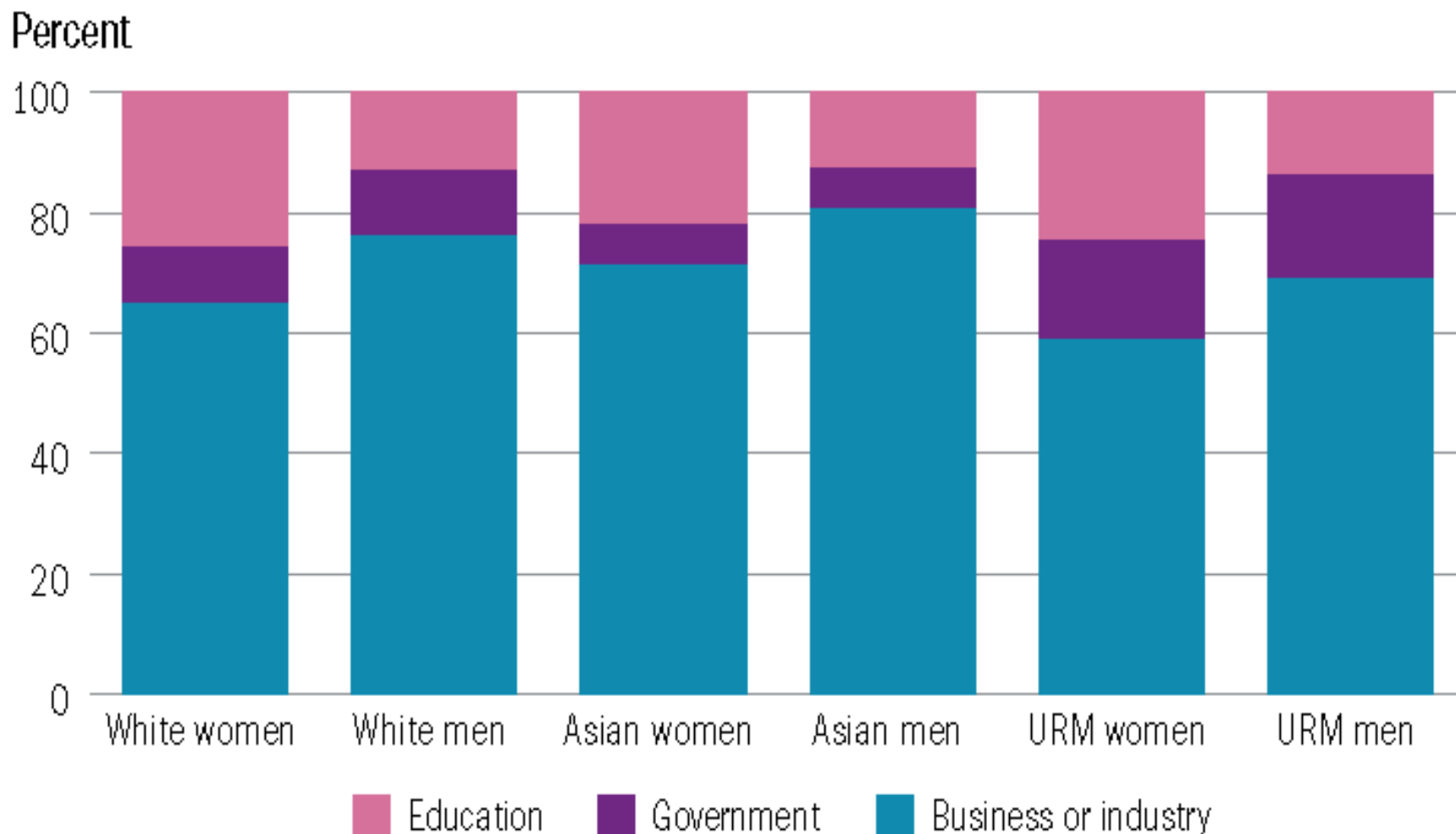
Race and ethnicity of all engineers: 2015



Race and ethnicity of engineers with doctoral degrees: 2015

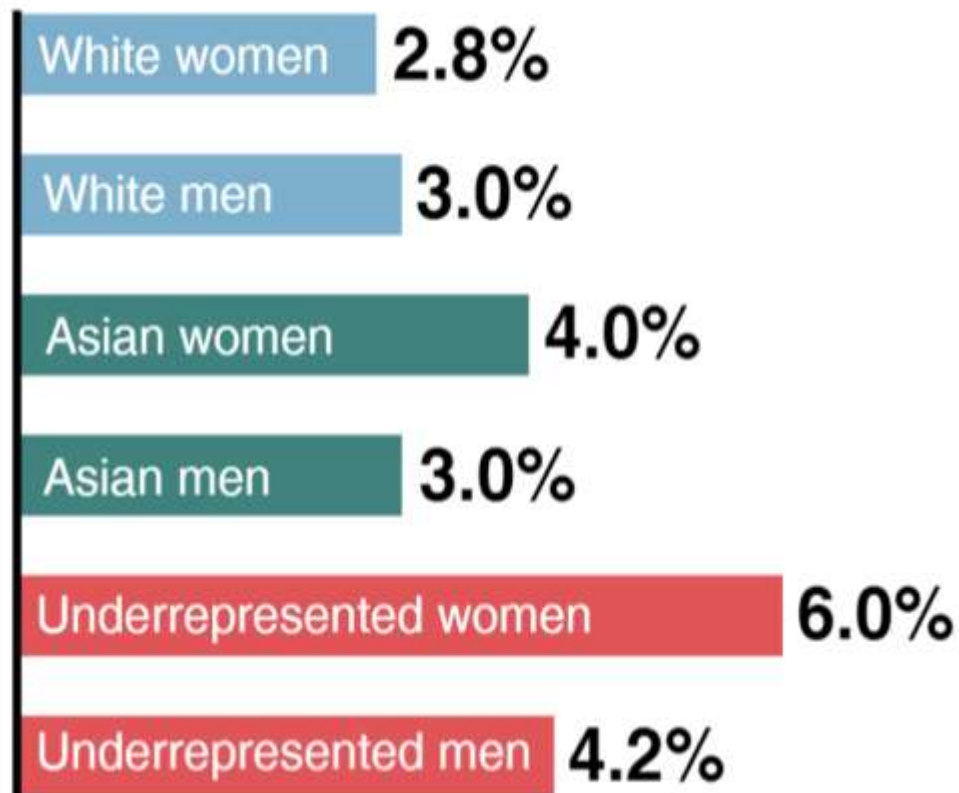
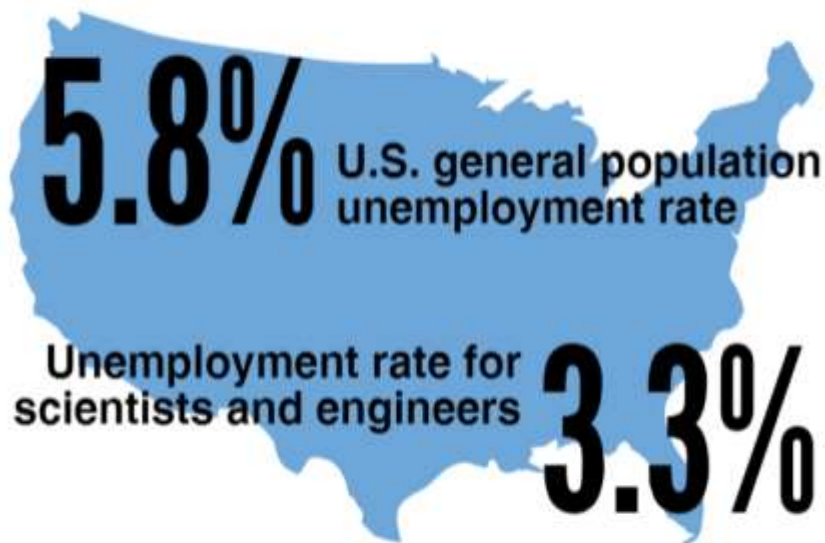


Employment sectors of scientists and engineers, by sex, race and ethnicity: 2015



URM = underrepresented minority.

Unemployment rate among scientists and engineers: 2015



Accessing WMPD

<https://www.nsf.gov/statistics/wmpd>



Women, Minorities, and Persons with Disabilities in Science and Engineering

[Digest](#) [Data](#) [Technical Notes](#) [Additional Resources](#) [Citation](#) [Downloads](#) [How Do I...](#)



Women, Minorities, and Persons with Disabilities in Science and Engineering provides statistical information about the participation of these three groups in science and engineering education and employment. A formal report, in the form of a digest, is issued every 2 years.

Digest

Interactive
Presentation

Data

Available in PDF and
Excel

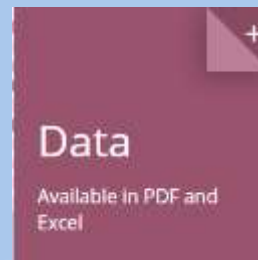
Additional
Resources

How Do I...



National Science Foundation | National Center for Science and Engineering Statistics (NCSES) | [Contact Us](#)

Women, Minorities, and Persons with Disabilities in Science and Engineering | Arlington, VA | NSF 17-310 | January 2017



Digest Data Technical Notes Additional Resources Citation Downloads How Do L...

About this report

Introduction

Introduction

Employment

Field of degree: Women

Field of degree: Minorities

Field of degree: Women, men, and racial and ethnic groups

Occupation

Employment status

Early career doctorate holders

Data sources

Glossary and key to acronyms

Introduction

The representation of certain groups of people in science and engineering (S&E) education and employment differs from their representation in the U.S. population. Women, persons with disabilities, and three racial and ethnic groups—Blacks, Hispanics, and American Indians or Alaska Natives—are underrepresented in S&E. While women have reached parity with men among S&E degree recipients overall, they constitute disproportionately smaller percentages of employed scientists and engineers than they do of the U.S. population. Blacks, Hispanics, and American Indians or Alaska Natives have gradually increased their share of S&E degrees, but they remain underrepresented in educational attainment and the S&E workforce. By contrast, Asians are overrepresented among S&E degree recipients and employed scientists and engineers.

Underrepresentation and overrepresentation of women and racial or ethnic groups vary by field of study and occupation. Variations in the representation of these groups are rooted in differences in precollege course taking, participation in S&E higher education, and overall educational attainment.

Women and underrepresented minorities constituted a substantial portion of the U.S. population ages 18 to 64 years in 2014. Women were about 50% of this population; Hispanics, 17%; blacks, 11%; Asians, 5%; and other racial and ethnic groups combined (American Indians or Alaska Natives, native Hawaiians or Other Pacific Islanders, and individuals who report more than one race and are not Hispanic), 2%. According to the latest Census Bureau projections, minorities will account for 56% of the U.S. population by 2060. The largest growth is projected in the numbers of Hispanics. Asians, and persons of multiple races. Despite increasing numbers, the proportion of blacks is projected to grow only 1 percentage point by 2060.

Noninstitutionalized resident population of the United States ages 18–64, by race, ethnicity, and sex: 2014

Chart View Table View

Race/Ethnicity	Sex	Percentage
White	Women	21%
White	Men	31%
Black	Women	8%
Black	Men	6%
Asian	Men	3%
Asian	Women	3%
Hispanic	Women	3%
Hispanic	Men	3%
Other	Men	1%
Other	Women	1%

Digest Data Technical Notes Additional Resources Citation Downloads How Do L...

Data Tables

Tables are updated as new information becomes available and are current as of the date shown on the list.

Download All Tables (2,09 AM)

Filter by: **Disability** **Minority Women** **Race and Ethnicity** **Sex**

Table	Excel	PDF	Posted
U.S. demographics			
resident population: 2014			
1-1	Excel	PDF	6/2016
1-2	Excel	PDF	6/2016
U.S. civilian noninstitutionalized population: 2014			
1-3	Excel	PDF	6/2016
Undergraduate enrollment			
by citizenship, ethnicity, race, sex, and enrollment status			
2-1	Excel	PDF	6/2016
2-2	Excel	PDF	6/2016
2-3	Excel	PDF	6/2016
2-4	Excel	PDF	6/2016
2-5	Excel	PDF	6/2016
by disability status: 2012			
2-6	Excel	PDF	1/2015
2-7	Excel	PDF	1/2015
freshman intentions to major in S&E fields: 2014			
2-8	Excel	PDF	6/2016
engineering			

Accessing NCSES Data

SESTAT Data Tool (<https://ncesdata.nsf.gov/sestat/sestat.html>)

The image shows two overlapping screenshots of NCSES data tools. The background screenshot is the SESTAT Data Tool, which is a web-based interface for selecting and generating data tables. It features a navigation bar with buttons for 'Select Survey', 'Choose Variables', 'Specify Population', 'Select Data Type', and 'Generate Table'. The main content area shows a list of surveys, including 'Integrated Survey Data, SESTAT PUBLIC 2013', and a table for selecting variables and years. The foreground screenshot is the WebCASPAR Data Tool, which is a more advanced interface for modifying analysis variables. It includes a 'Modify Analysis Variables' section with a list of variables such as 'NSF Survey of Earned Doctorates/Doctorate Records File' and 'NSF Survey of Federal Funds for Research and Development'. The WebCASPAR interface also has a navigation bar with options like 'HOME', 'TABLE BUILDER', and 'FIND A VARIABLE'.

WebCASPAR Data Tool (<https://ncesdata.nsf.gov/webcaspar/TableBuilder>)
(being phased out)

Accessing NCSES Data (continued)

New Interactive Data Tool

(https://ncesdata.nsf.gov/ids/?utm_source=Main&utm_medium=Main&utm_campaign=Main)

The screenshot shows the NCSES Data Interactive Tool interface. On the left is a dark sidebar with navigation options: 'NAVIGATE BY SURVEY' (Custom Tables), 'NAVIGATE BY TOPIC' (Business & Industry, Education, Federal Government, International, Research & Development, Social Dimensions, State, Workforce), and 'View All Topics'. The main content area has a blue header with 'NSF Home', 'Research Areas', 'SSE', and 'NCSES'. Below the header is a large blue graphic with a grid pattern. The main text reads 'Introducing the new NCSES Interactive Tool!' and explains that the tool consolidates previous platforms into one easy-to-use system. It lists five steps for getting started: 1. Select a survey using the 'UP' icon on the left or from the 'Navigate by Survey' menu. 2. Check the box next to at least one measure and as many dimensions you want to appear in your table. 3. Drag and drop variables and expand items to create the layout you prefer. 4. Filter the table by selecting individual items and pressing enter, or click a variable name in the corner of the table and select from the dropdown. 5. Download the data using the 'Export to CSV' button at the top right. Below the steps, it notes that the tool currently provides access to data from surveys from the WebCASPAR platform, which will be inaccessible towards the end of 2018. In the coming months, the new NCSES tool will be updated with data from surveys from SESTAT and other NCSES platforms. At the bottom, it says 'version 1.1.1 (Release 10/16)' and 'National Science Foundation, 2415 Eisenhower Avenue, Alexandria, Virginia 22314, USA Tel: (703) 292-5111, FRS: (800) 877-4338 | TDD: (800) 281-8749 | 10/16 NCSES3'.

Microdata: Public-use and restricted-use files

(<https://www.nsf.gov/statistics/data-tools.cfm#micro-data>)

Thank you for your interest

NCSES strives to make data and analysis available to all members of the public.

<https://www.nsf.gov/statistics/>

- Data tables
- Online data tools
- Microdata files

If you are seeking information about women, minorities, or persons with disabilities, please contact:

- Karen Hamrick, Senior Analyst, khamrick@nsf.gov
- Jaqui Falkenheim, Senior Analyst, jfalkenh@nsf.gov

If you are seeking methodological information about our education or workforce surveys, please contact:

- Lynn Milan, Project Officer, lmilan@nsf.gov
- John Finamore, HRS Program Director, jfinamor@nsf.gov