

Additional Information

The National Science Foundation is committed to supporting diversity in Science and Engineering fields and occupations. Broadening participation is essential to our nation's assurance of equal opportunity in all aspects of education in Science and Engineering fields and for the development of a diverse, qualified workforce that is internationally competitive.

NSF has a number of programs addressing the issues of minorities and women in Science and Engineering fields, including:

- Alliances for Graduate Education and the Professoriate (AGEP)
http://nsf.gov/funding/pgm_summ.jsp?pims_id=5474&org=HRD&from=home
- Broadening Participation in Computing
http://nsf.gov/funding/pgm_summ.jsp?pims_id=13510&org=CISE&from=home
- Centers for Research Excellence in Science and Technology (CREST)
http://nsf.gov/funding/pgm_summ.jsp?pims_id=6668&org=HRD&from=home
- Faculty Early Career Development (CAREER) Program
<http://www.nsf.gov/home/crssprgm/career/start.htm>
- Historically Black College and University Initiative (HBCU-UP)
http://nsf.gov/funding/pgm_summ.jsp?pims_id=5481&org=HRD&from=home
- Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE) <http://www.nsf.gov/home/crssprgm/advance/>
- Model Institutions for Excellence (MIE)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5739&org=HRD&from=home
- Opportunities for Enhancing Diversity in the Geosciences
<http://nsf.gov/geo/diversity/index.jsp>
- Partnership for Research and Education in Materials
http://www.nsf.gov/pubsys/ods/getpub.cfm?ods_key=nsf03564
- Research on Gender in Science and Engineering (GSE)
http://nsf.gov/funding/pgm_summ.jsp?pims_id=5475&org=HRD&from=home
- STEM Talent Expansion Program (STEP)
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5488&org=DUE
- The Louis Stokes Alliances for Minority Participation (LSAMP)
http://nsf.gov/funding/pgm_summ.jsp?pims_id=5477&org=HRD&from=home
- Tribal Colleges and Universities (TCUP)
<http://www.ehr.nsf.gov/EHR/HRD/tcup.asp>

If you are interested in these and other National Science Foundation programs, related information and NSF staffing, or how you can might become more involved, go to the NSF website at www.nsf.gov.

"The U.S. has always been a nation of diverse cultures, races, opinions, and beliefs. This characteristic diversity has helped shaped our democracy, and creativity, optimism, and resilience. As our population continues to grow increasingly diverse, we must ensure that the science and engineering workforce is similarly reflective of these changes. Our scientific and engineering preeminence depends on it."

Dr. Arden L. Bement, Jr.
Director, National Science Foundation

ADDITIONAL WEBSITES

NSF Directorate for Education and Human Resources
<http://www.nsf.gov/dir/index.jsp?org=EHR>

NSF Division of Human Resource Development
<http://www.nsf.gov/div/index.jsp?div=HRD>

NSF Division of Science and Resource Statistics
<http://www.nsf.gov/sbe/srs/stats.htm>

NSF Study: Women, Minorities, and Persons with Disabilities, in Science and Engineering, 2004
<http://www.nsf.gov/sbe/srs/wmpd/start.htm>

Gender Differences in the Careers of Academic Scientists and Engineers: Special Report
<http://www.nsf.gov/sbe/srs/nsf04323/start.htm>

A National Analysis of Diversity in Science and Engineering Faculties at Research Universities 15 Jan 04 Briefings
<http://cheminfo.chem.ou.edu/faculty/djn/diversity/top50.html>

NSF Committee on Equal Opportunities in Science and Engineering (CEOSE)
<http://www.nsf.gov/od/oia/activities/ceose/>

BIBLIOGRAPHY

American Association for the Advancement of Science, 2004. *IN PURSUIT OF A DIVERSE SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) WORKFORCE: RECOMMENDED RESEARCH PRIORITIES TO ENHANCE PARTICIPATION BY UNDERREPRESENTED MINORITIES*. Washington DC: AAAS.

Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development, 2000. *LAND OF PLENTY: DIVERSITY AS AMERICA'S COMPETITIVE EDGE IN SCIENCE, ENGINEERING AND TECHNOLOGY*. Arlington: National Science Foundation.

Ginorio, Angela, 1995. *WARMING THE CLIMATE FOR WOMEN IN ACADEMIC SCIENCE*. Washington DC: Association of American Colleges and Universities.

Huang, Gary, Taddese, Nebiyu, & Walter, Elizabeth, 2000. *ENTRY AND PERSISTENCE OF WOMEN AND MINORITIES IN COLLEGE SCIENCE AND ENGINEERING EDUCATION* (NCES PUBLICATION NO. 2000-601). Washington DC: US Department of Education, Office of Educational Research and Improvement.

Long, J. S. 2001. *FROM SCARCITY TO VISIBILITY: GENDER DIFFERENCES IN THE CAREERS OF DOCTORAL SCIENTISTS AND ENGINEERS*. Washington, DC: National Academy Press.

Matyas, Marsha Lakes & Malcolm, Shirley (Eds). (1991). *INVESTING IN HUMAN POTENTIAL: SCIENCE AND ENGINEERING AT THE CROSSROADS*. Washington DC: American Association for the Advancement of Science.

National Research Council, 2001. *MINORITIES IS THE CHEMICAL WORKFORCE: DIVERSITY MODELS THAT WORK* (A WORKSHOP REPORT TO THE CHEMICAL SCIENCES ROUNDTABLE), National Academies Press, Washington, DC

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2003. *WOMEN, MINORITIES AND PERSONS WITH DISABILITIES IN SCIENCE AND ENGINEERING: 2002*, Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2004. *SCIENCE AND ENGINEERING DOCTORAL AWARDS 2002* (NSF 04-303), Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2003. *GENDER DIFFERENCES IN THE CAREERS OF ACADEMIC SCIENTISTS AND ENGINEERS: A LITERATURE REVIEW* (NSF 03-322), Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2003. *CHARACTERISTICS OF DOCTORAL SCIENTISTS AND ENGINEERS IN THE UNITED STATES 2001*. (NSF 03-310), Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2004. *PLANS FOR POSTDOCTORAL RESEARCH APPOINTMENTS AMONG RECENT U.S. DOCTORATE RECIPIENTS* (NSF 04-308), Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 2002. *Science and Engineering Degrees, by Race /Ethnicity of Participants: 1991-2000* (NSF 02-329), Arlington.

National Science Foundation, Division of Science Resource Statistics (NSF/SRS) 1999. *DESPITE INCREASES, WOMEN AND MINORITIES STILL UNDERREPRESENTED IN UNDERGRADUATE AND GRADUATE S&E EDUCATION*. (NSF 99-320), Arlington.

Nelson, Donna & Diana Rogers 2003. *A NATIONAL ANALYSIS OF DIVERSITY IN SCIENCE AND ENGINEERING FACULTIES AT RESEARCH UNIVERSITIES*. Norman: University of Oklahoma.

Broadening Participation in Science and Engineering:

Minority and Women Faculty in Academia

By Margrete S. Klein and Andrew Watkins

National Science Foundation, January 2005



Disclaimer: This brochure is not meant to be an all inclusive document on diversity and is targeted to ethnic minorities and women only. Equivalent data pertaining to the disabled community can be found in NSF 04-322.

Overview

"It is vital to our national security that we harness the nation's human resource talent. Presently, the nation's diverse human resources are under utilized. As an increasing number of underrepresented groups of Americans are seeking to obtain undergraduate and graduate degrees, it is essential to also encourage them to consider science and engineering fields of study."

Dr. Warren Washington
Chair, National Science Board

Senior Scientist and Section Head, National Center for Atmospheric Research (NCAR)

The lack of minority faculty in our nation's four-year colleges and universities is obvious and well-documented, and not reflective of the nation's diverse human resource base. This is particularly evident in the fields supported by the National Science Foundation (NSF) - the social, behavioral and economic sciences, mathematical and physical sciences, biological sciences, engineering, computer and information science, and the geosciences. To ensure our status as the world's leading industrial nation and further develop our quality of life, we must broaden participation in the nation's scientific workforce. An educated workforce, reflecting the nation's rich human resource base, will encourage more of America's young people to pursue studies and careers in science and engineering.

Looking at the overall U.S. population, only Asian/Pacific Islanders and Caucasians had a larger representation in the doctoral science and engineering workforce (academia and industry) than in the overall population. Women and minorities are still substantially underrepresented in the doctoral science and engineering workforce.

Ethnicity/Race U.S. POPULATION 2000 DOCTORAL SCIENCE & ENGINEERING WORKFORCE 2001

Ethnicity/Race U.S.	POPULATION 2000	DOCTORAL SCIENCE & ENGINEERING WORKFORCE 2001
African American	12%	2%
Asian/Pacific Islander	4%	16%
Caucasian	71%	78%
Hispanic	12%	3%
Native American	0.9%	0.3%

Source: NSF-SRS 2004, <http://www.nsf.gov/sbe/srs/wmpd/tables/tabh-2.xls>

The following data focuses on the current status of minority and women employed in the nation's colleges and universities. The source of the data is the National Science Foundation's Division of Science Resource Statistics (SRS) and is the most current data available. SRS data can be obtained at <http://www.nsf.gov/sbe/srs/stats.htm>.

Minority Employment

"Diversity is more important than one might realize, not only because this is where the talent of the future resides, but our diversity is an under utilized treasure - a valuable asset in and of itself."

Dr. Shirley Ann Jackson
President, Rensselaer Polytechnic Institute
President, American Association for the Advancement of Science

Academic and private sector science and engineering and non-science and engineering employment continues to be dominated by Caucasian males.

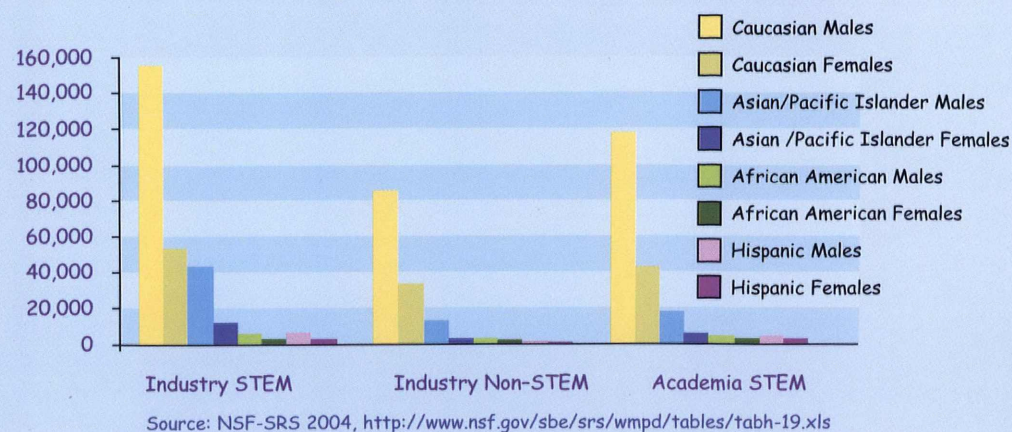
- 22,000 African American, Hispanic, and Native American science and engineering doctorate holders are employed in the private sector in science and engineering and non-science and engineering positions compared to nearly 416,000 Caucasians and Asian/Pacific Islanders.

- Over 14 times as many Asian/Pacific Islanders are working in all three sectors compared to African American, Hispanic and Native American science and engineering doctorate holders.

Source: NSF-SRS 2004, <http://www.nsf.gov/sbe/srs/wmpd/tables/tabh-19.xls>

Minority Employment (cont.)

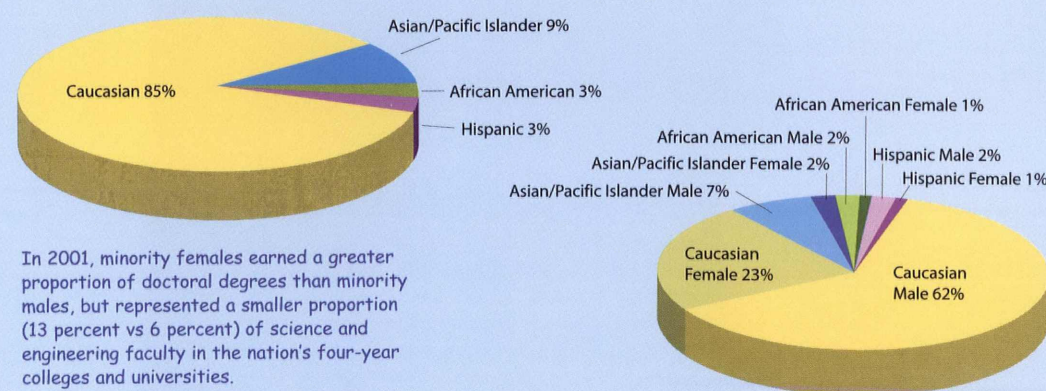
Employment of Science and Engineering Doctorate Holders by Sector, Gender and Race: 2001



Academia

African Americans, Hispanics, and Native Americans represented 26 percent of the U.S. population in 2000, but made-up only 6 percent of science and engineering doctoral employees in the nation's four-year colleges and universities.

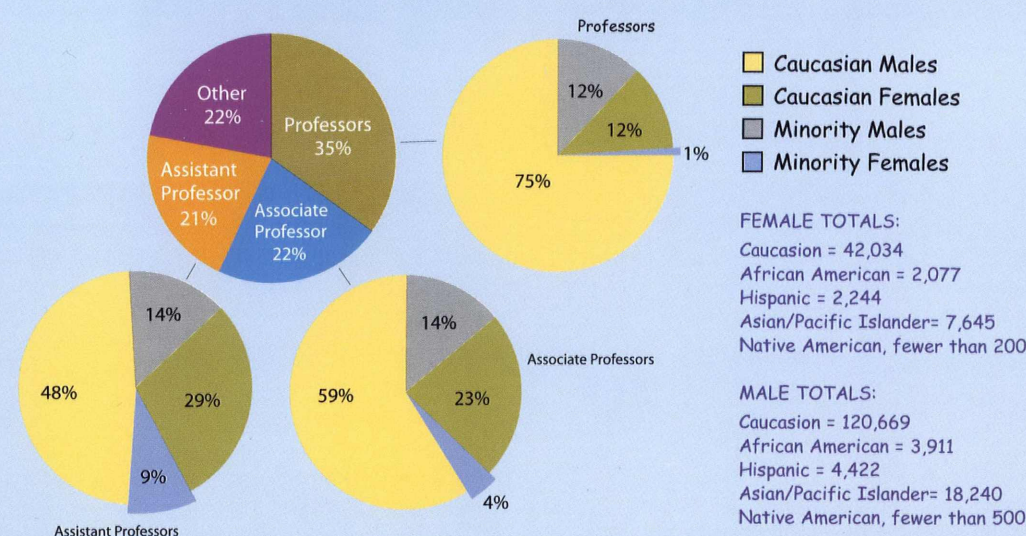
Total Science and Engineering Doctorates Employed in Academia, by Race and Gender: 2001



In 2001, minority females earned a greater proportion of doctoral degrees than minority males, but represented a smaller proportion (13 percent vs 6 percent) of science and engineering faculty in the nation's four-year colleges and universities.

Source: NSF-SRS 2004, <http://www.nsf.gov/sbe/srs/wmpd/tables/tabh-21.xls>

Distribution of Science and Engineering Full-Time Doctoral Employees in the Nation's Four-Year Colleges and Universities by Race, Gender, and Rank: 2001



■ Caucasian Males
■ Caucasian Females
■ Minority Males
■ Minority Females

FEMALE TOTALS:
 Caucasian = 42,034
 African American = 2,077
 Hispanic = 2,244
 Asian/Pacific Islander = 7,645
 Native American, fewer than 200

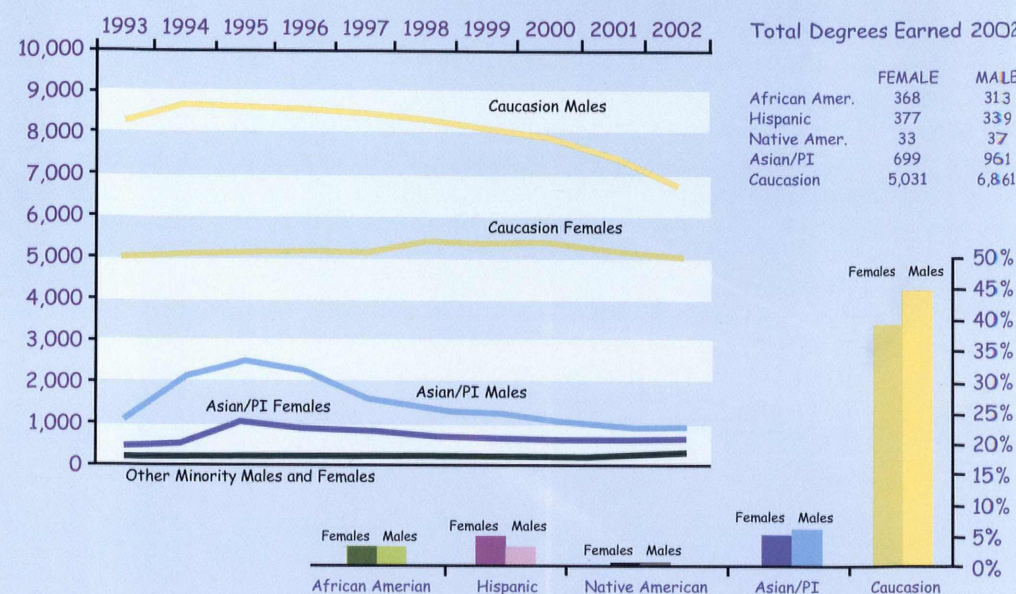
MALE TOTALS:
 Caucasian = 120,669
 African American = 3,911
 Hispanic = 4,422
 Asian/Pacific Islander = 18,240
 Native American, fewer than 500

Future Directions

In 2002, African Americans, Hispanics and Native Americans earned only 10 percent of the total science and engineering doctorates awarded, while Asian/Pacific Islanders earned more than 20 percent. Asian/Pacific Islanders and Caucasians earned a larger percentage of science and engineering doctorates than their representation in the overall U.S. population.

Source: NSF-SRS 2004, <http://www.nsf.gov/sbe/srs/nsf04303/tables/tab3.xls>
<http://www.nsf.gov/sbe/srs/wmpd/tables/tabf-11.xls>

Total Science and Engineering Doctorates Earned, by Gender and Race: 1993-2002



Distribution of Science and Engineering Doctorate Degrees by Gender and Race: 2002

Top Ten Institutions for SCIENCE AND ENGINEERING Doctorates Earned by African Americans, American Indian or Alaskan Natives, Asian/Pacific Islanders and Hispanics *: 1998-2002

1. University of California - Berkeley
2. University of California - Los Angeles
3. Stanford University
4. University of Michigan at Ann Arbor
5. University of Illinois at Urbana - Champaign
6. Harvard University
7. Massachusetts Institute of Technology
8. University of California - Davis
9. University of Texas at Austin
10. Columbia University in the City of New York

* The top ten schools (in descending order) for science and engineering doctorates earned by African Americans, American Indian or Alaskan Natives, and Hispanics (excluding Asian/Pacific Islanders) were Howard University, Caribbean Center for Advanced Studies, University of California-Berkeley, University of Michigan at Ann Arbor, University of Puerto Rico Piedras Campus, Stanford University, Harvard University, Texas A&M Main Campus, University of Texas at Austin, and University of Maryland at College Park.
 Source: NSF-SRS, Survey of Earned Doctorates, 1998-2002

The overall lack of minorities and women working in academia as science and engineering faculty members and in the private sector continues to stand in sharp contrast to their representation in the U.S. population (NSF-SRS-NSF04317). Since a more diverse science and engineering faculty can help motivate and encourage young minorities and women to pursue careers in science and engineering, an important challenge is to increase the representation of minorities and women employed in science and engineering faculty positions in the nation's universities and four-year colleges. Aggressive efforts in this area need to be developed and implemented in pursuit of maintaining our status as the world's leading industrial nation, to further develop our quality of life, and to ensure that our country has a well-educated and diverse science and engineering workforce.

"Talent is everywhere around us. It crosses geographic, ethnic, racial, and gender boundaries. Unfortunately, in too many settings there is little or no opportunity to develop it. We cannot afford to continue to underestimate the potential of Hispanics, African Americans, and Native Americans. They represent a fast-growing segment of our population, and the quality of all of our lives will depend on our investment in their full participation."

Dr. Diana Natalicio
President, University of Texas at El Paso
Vice President, National Science Board