

Commission on Professionals in Science and Technology

A large graphic of the CPST logo, consisting of a dark teal horizontal bar above a light teal horizontal bar, with the letters 'CPST' in white serif font centered across the bars.

CPST

Lisa M. Frehill
Executive Director

A small version of the CPST logo graphic, featuring a dark teal bar above a light teal bar with the letters 'CPST' in white.

CPST

<http://www.cpst.org>

. . . Your workforce data source.

Acronyms

■ Science

■ Technology

■ Engineering

■ Mathematics

■ Under

■ Represented

■ Minorities

Includes: African Americans,
American Indians, Alaska
Natives, and Hispanics

What is CPST?

- Founded in 1953
- Membership Research Organization
 - Societies – all major scientific societies
 - Corporations
 - Academic Institutions
 - Foundations
 - Individuals
- Participating organization of AAAS
- Staff:
 - Nathan Bell, Associate Director
 - Nicole Di Fabio, Research Assistant

Mission

- Collect, analyze, and disseminate reliable information about U.S. STEM workforce
- Promote best programs of education and training of STEM workers
- Develop utilization policies for STEM workforce

Publications

CPST Comments

January/February 2007
Volume 44, Number 1

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Women and Minorities

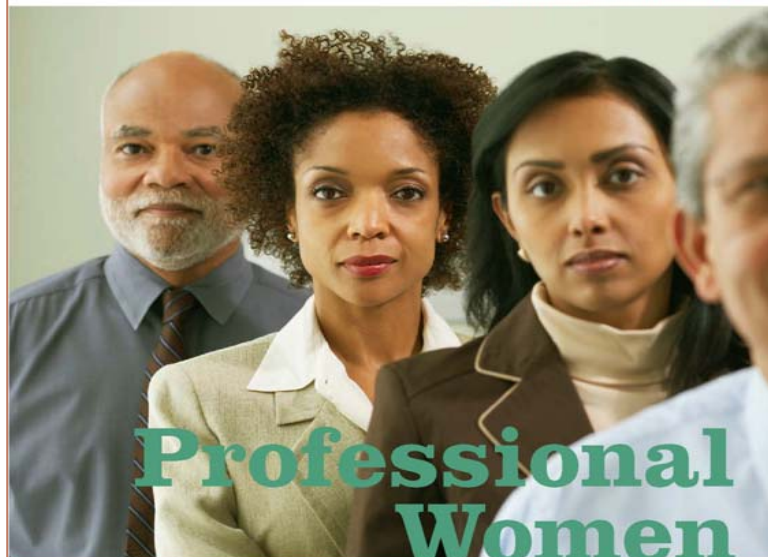
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Down Washington Corridors

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Professional Women and Minorities

A Total Human Resources Data Compendium
Sixteenth Edition • November 2006

PREPARED BY: NATHAN E. BELL, NICOLE M. DI FABIO, LISA M. FREHILL

Salaries of Scientists, Engineers and Technicians:

A Summary of Salary Surveys

21st Edition
November 2005

Commission on Professionals in Science and Technology



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... Your workforce data source.

Sources of data: National Science Foundation

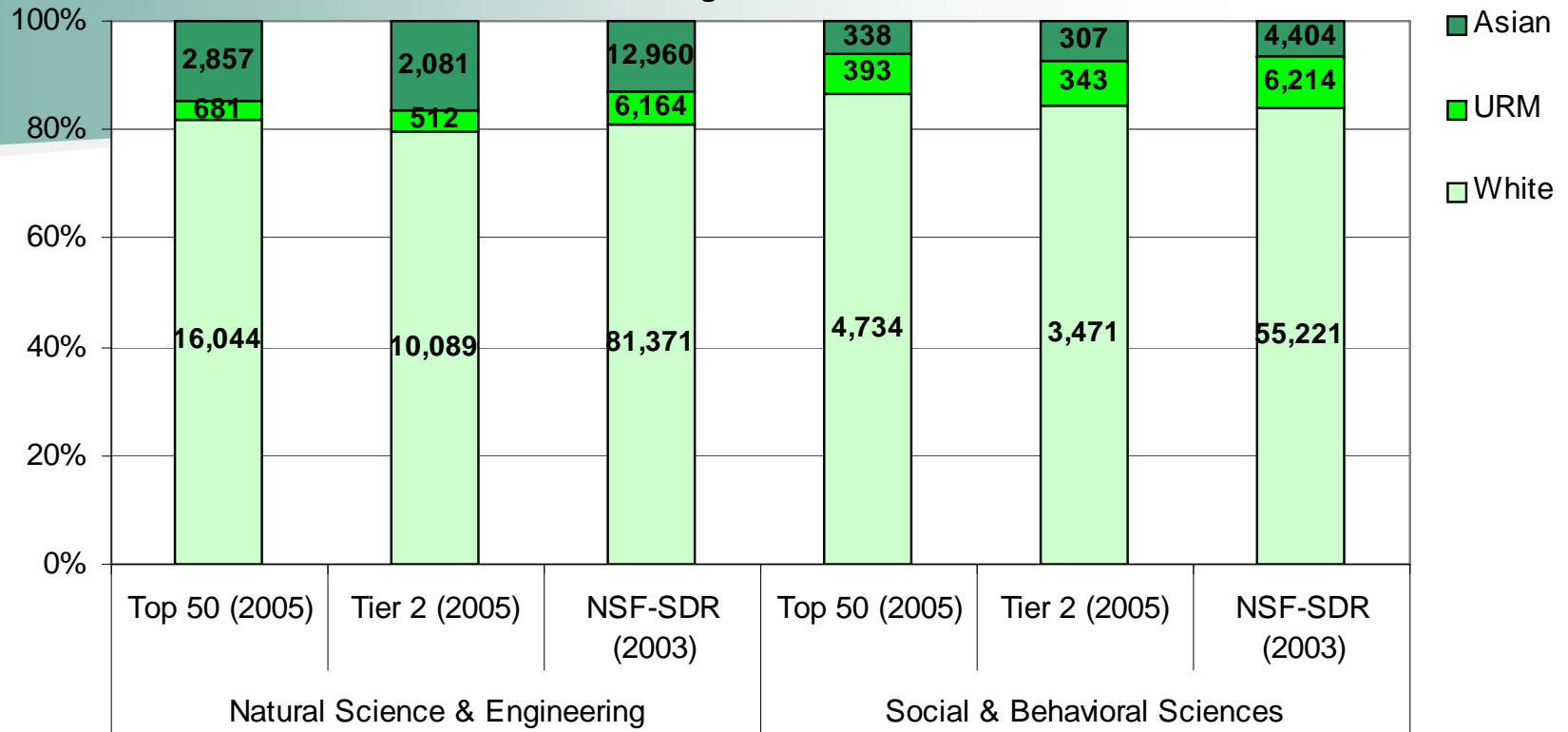
- Survey of Doctorate Recipients
 - NSF publication: *Science and Engineering Indicators* series.
 - Population: holders of U.S. science, health or engineering doctoral degrees who are in the United States (n=40,000 in 2003)
- Survey of Earned Doctorates
 - Annual NSF survey with >90% response rate
 - Population: recipients of doctoral degrees in all fields at U.S. colleges and universities

Other Sources of Faculty Data

- Nelson Diversity Surveys
 - “Top 50” and “Tier 2” departments based on NSF expenditures data, FY2002
 - Engineering: electrical, mechanical, chemical and civil
 - Natural Sciences: astronomy (top 40), Biology, chemistry, computer science, earth science, math and statistics, physics.
 - Social Sciences: economics, political science, psychology and sociology.
 - Reports by department head/chair or other person in department.
- National Center for Education Statistics: National Study of Postsecondary Faculty
 - Populations: all U.S. institutions of higher education and all faculty and instructional staff at those institutions
 - 1,080 institutions (86% response rate)
 - 35,000 faculty and instructional staff (76% response rate)

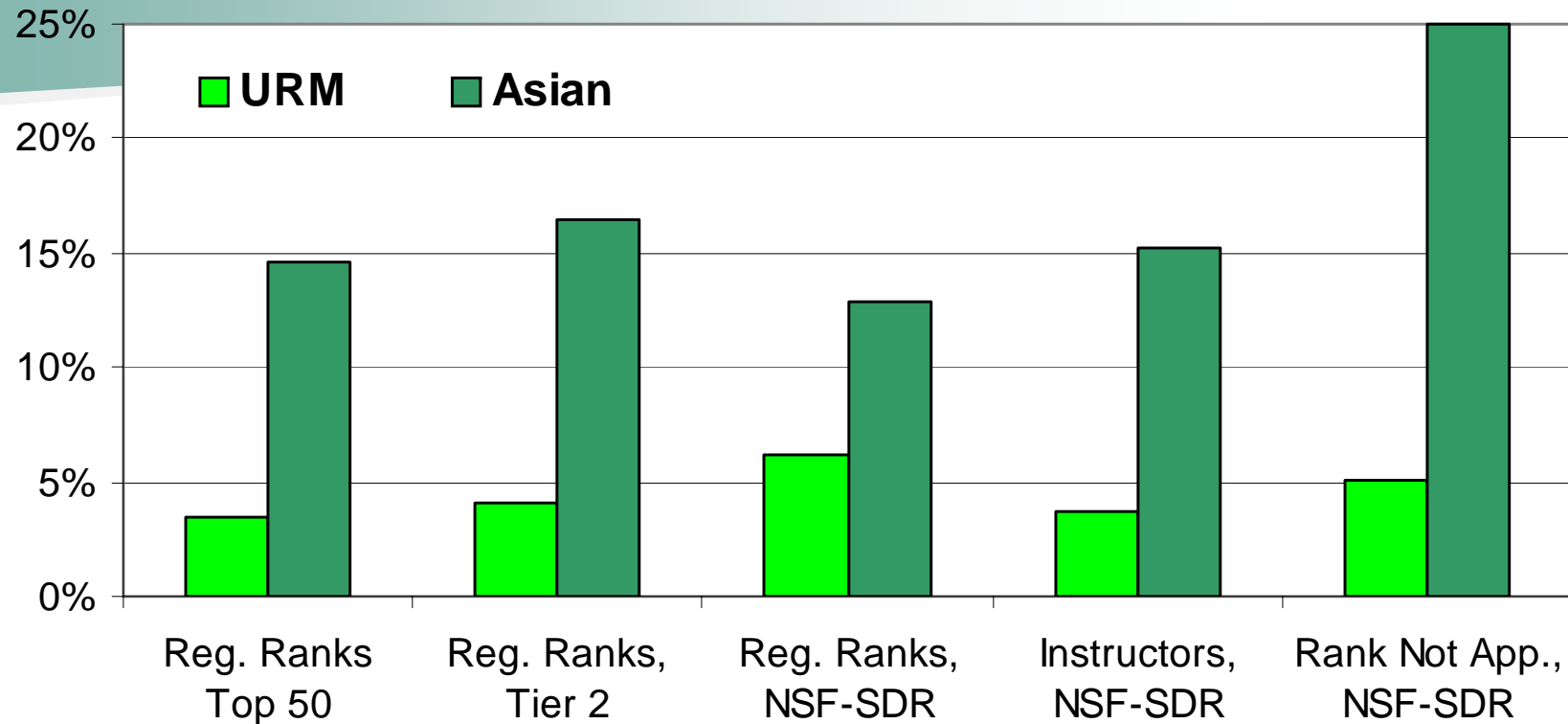
NSF & Nelson Diversity Survey Data

Relative Representation of Faculty by Ethnicity 4-Year Colleges and Universities



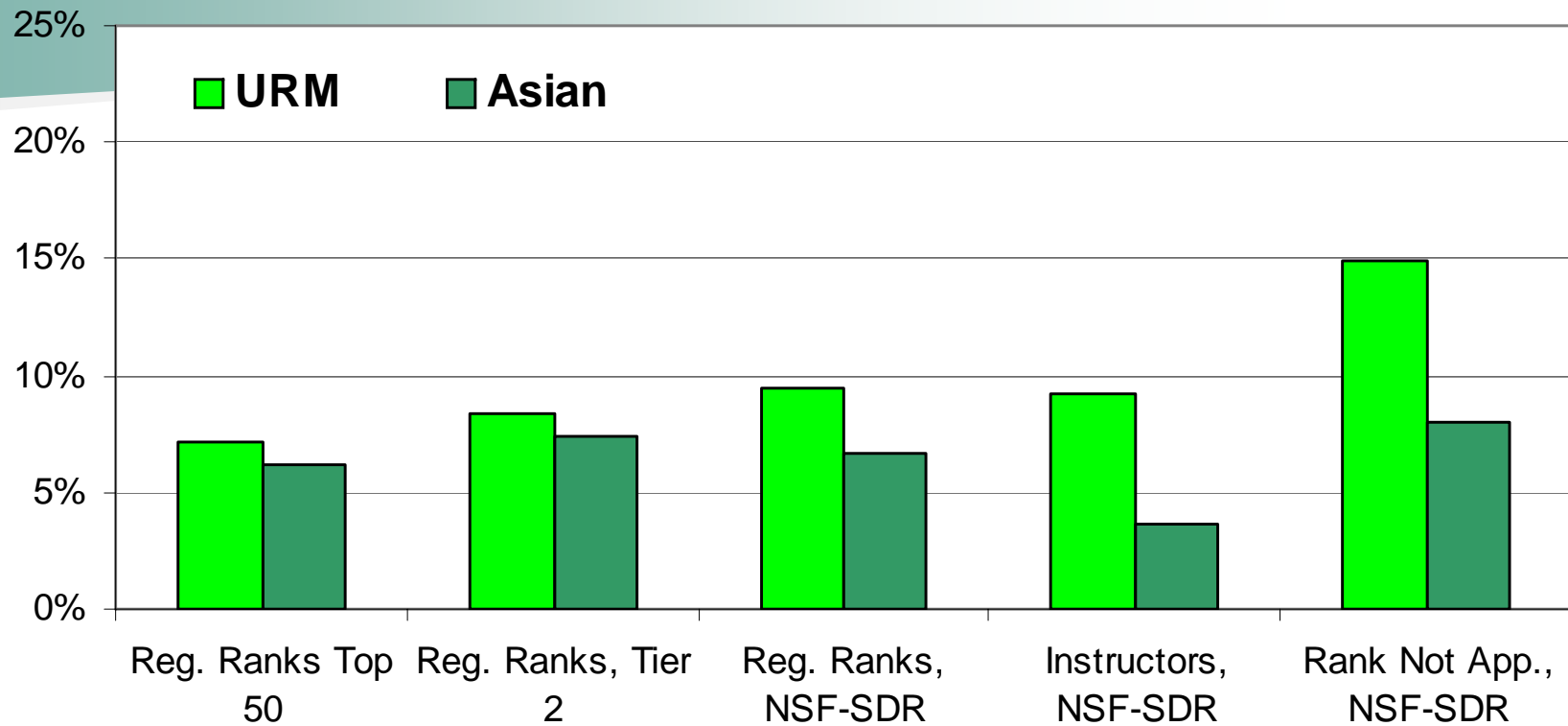
Sources: "Top 50" and "Tier 2" are from "Nelson Diversity Surveys" with "Top" departments defined by FY2002 research expenditures reported by NSF. "NSF-SDR" data are from NSF's Science and Engineering Indicators, 2006 Table H-25. Only faculty categorized as "Full," "Associate," or "Assistant" professor are included.

Relative Representation of URM and Asians in Natural Science and Engineering Faculty Positions



Sources: "Top 50" and "Tier 2" are from "Nelson Diversity Surveys" with "Top" departments defined by FY2002 research expenditures reported by NSF. "NSF-SDR" data are from NSF's Science and Engineering Indicators, 2006 Table H-25. "Reg. Ranks" are faculty categorized as "Full," "Associate," or "Assistant"

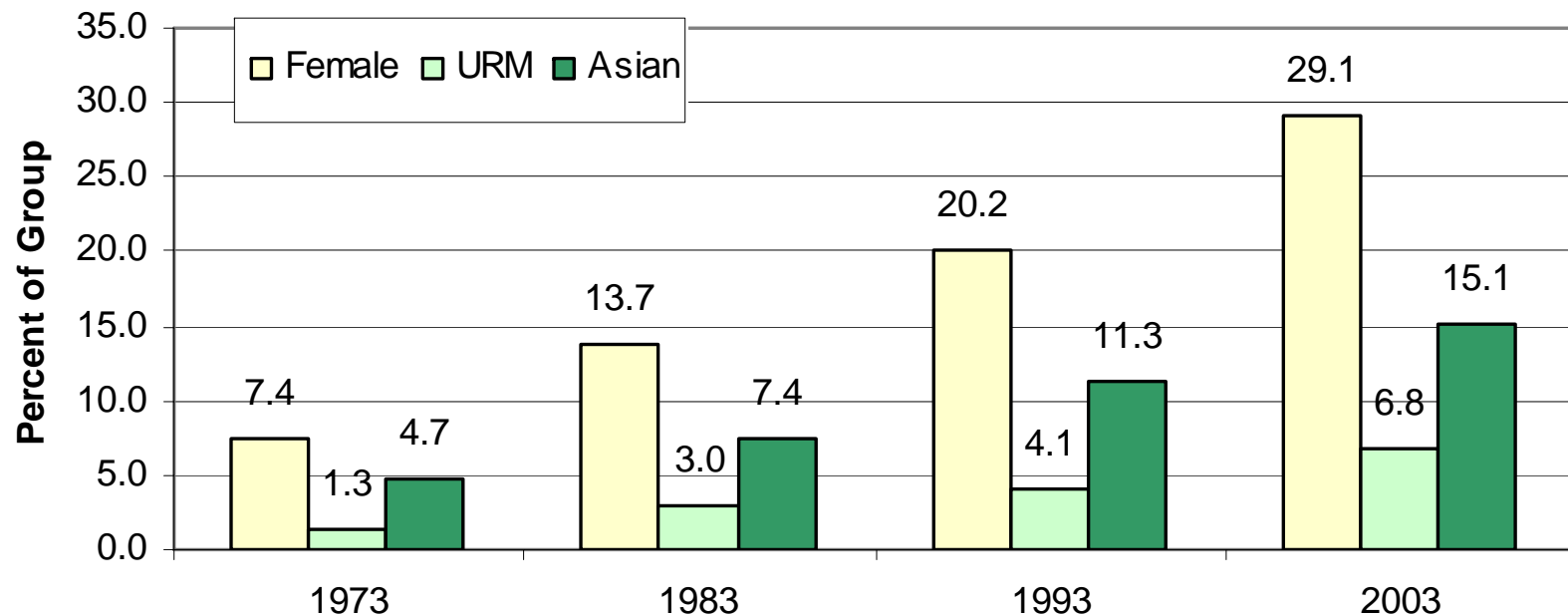
Relative Representation of URMs and Asians in Social and Behavioral Sciences Faculty Positions



Sources: "Top 50" and "Tier 2" are from "Nelson Diversity Surveys" with "Top" departments defined by FY2002 research expenditures reported by NSF. "NSF-SDR" data are from NSF's Science and Engineering Indicators, 2006 Table H-25. "Reg. Ranks" are faculty categorized as "Full," "Associate," or "Assistant"

Representation of women, under represented minorities and Asian/Pacific Islanders has increased at Carnegie Research Universities

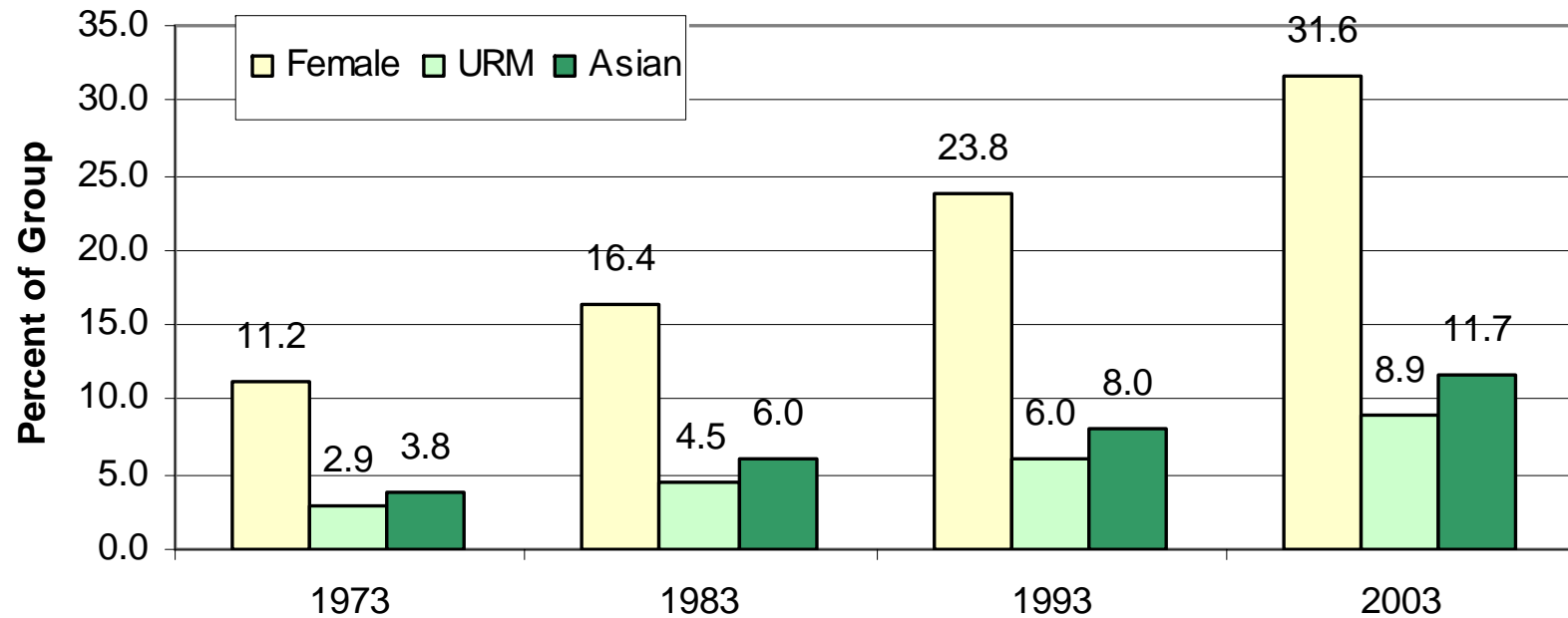
Representation of Selected S&E Doctorate Degree Holders as Faculty at U.S. Research Universities



Source: CPST analysis of National Science Foundation data reported in *Science and Engineering Indicators 2006*

Representation of women, under represented minorities and Asian/Pacific Islanders has also increased at “other institutions”

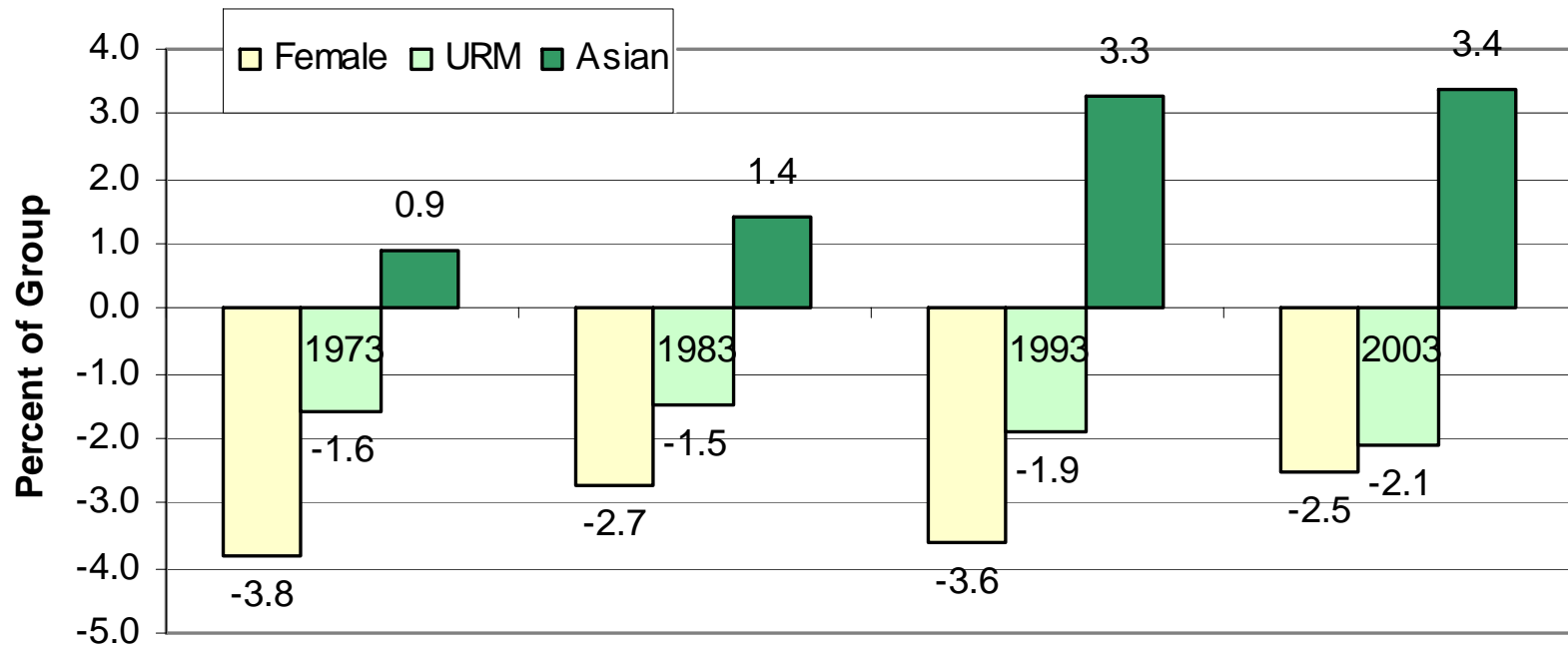
Representation of Selected S&E Doctorate Degree Holders as Faculty at U.S. Academic Institutions, Non-Research



Source: CPST analysis of National Science Foundation data reported in *Science and Engineering Indicators 2006*

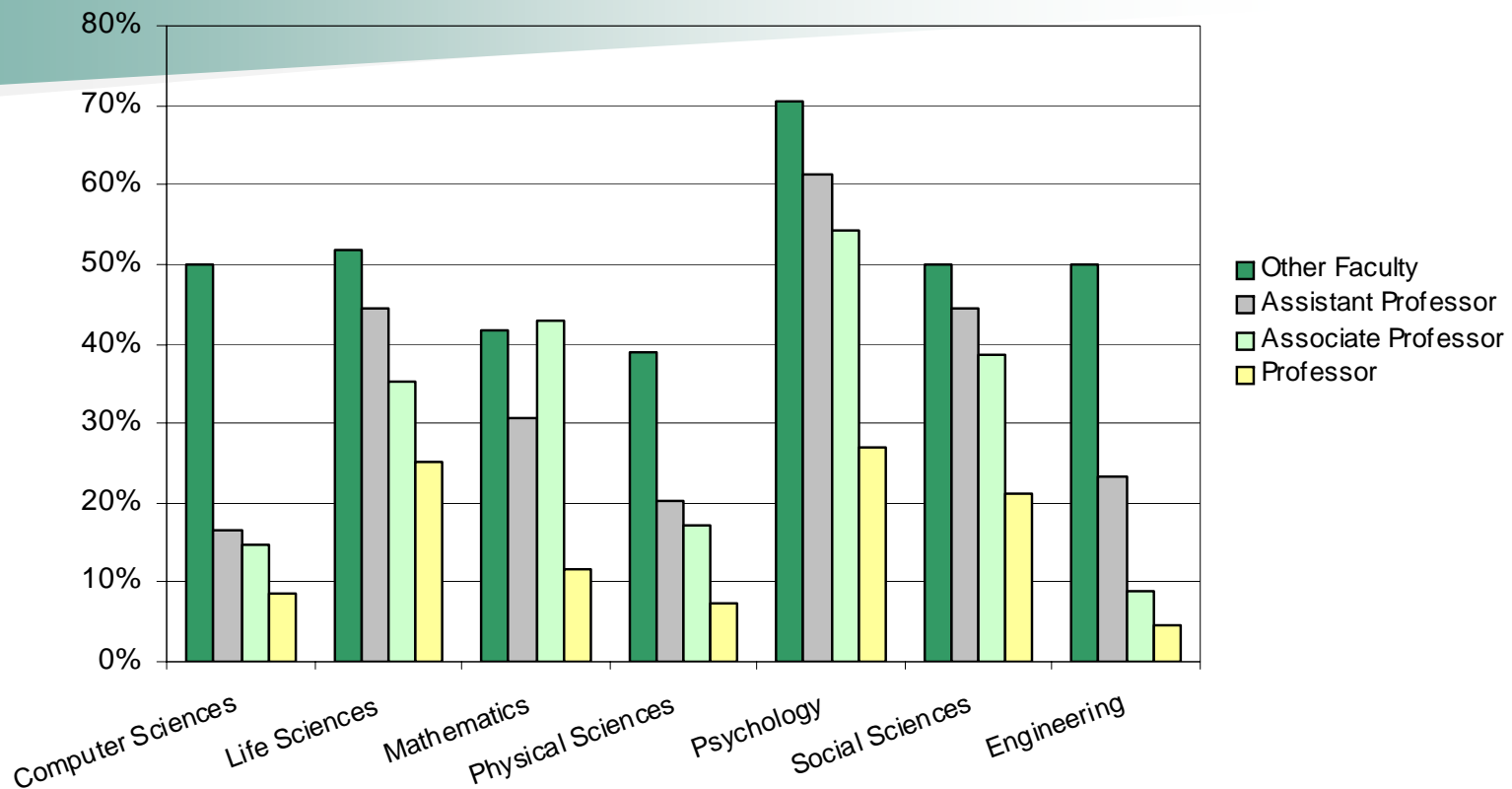
Women and under represented minorities are more likely to be at “other” institutions while Asian/Pacific Islanders are more likely to be at research universities

Gap in Representation of Selected S&E Doctorate Degree Holders as Faculty at U.S. Research vs. Other Academic Institutions



Source: CPST analysis of National Science Foundation data reported in *Science and Engineering Indicators 2006*

Women's representation diminishes as faculty rank increases among doctoral-degreed faculty at 4-year colleges and universities.



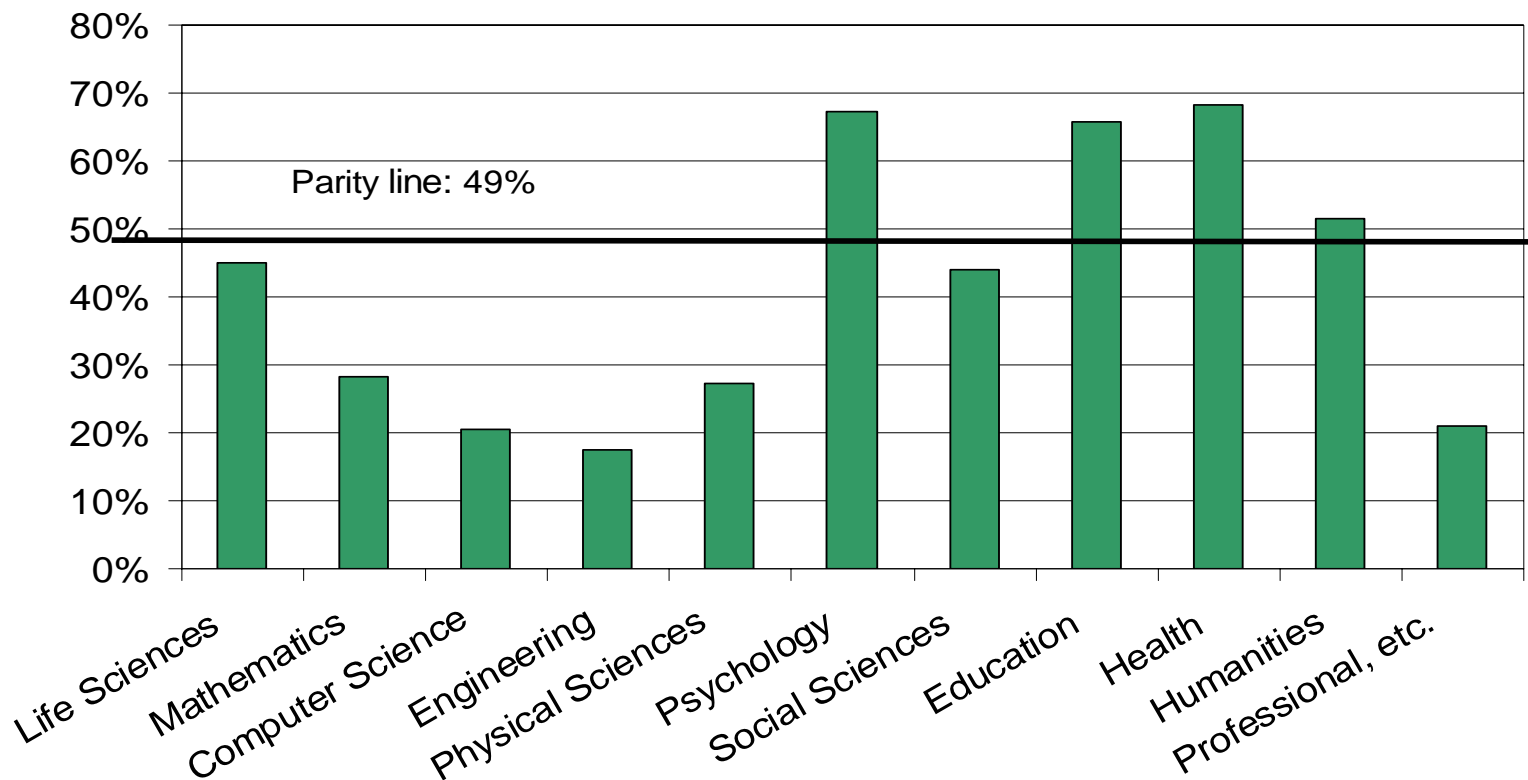
Source: Analysis of original data from: National Science Foundation. Women, Minorities, and Persons with Disabilities in Science and Engineering, 2007.

Characteristics of Recent Doctoral Recipients

NSF's Survey of Earned
Doctorates

Women's representation among doctoral recipients varies across fields

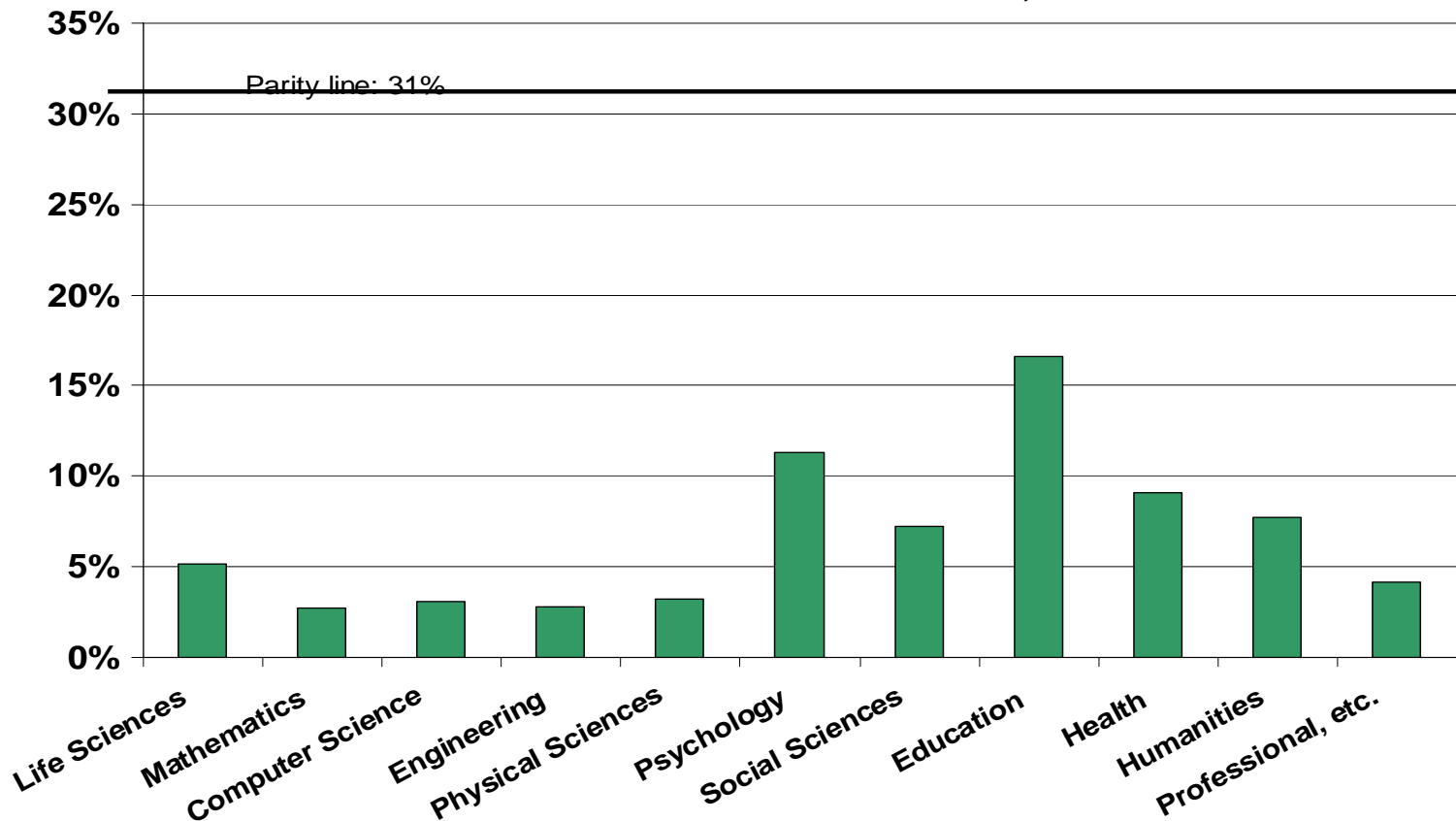
Percent Female Among Doctorate Recipients, 2004



Source: NSF Survey of Earned Doctorates, 2006. "Professional, etc." includes professional, unknown and other.

African Americans, American Indians, and Latinos/as are highly underrepresented among doctorate recipients

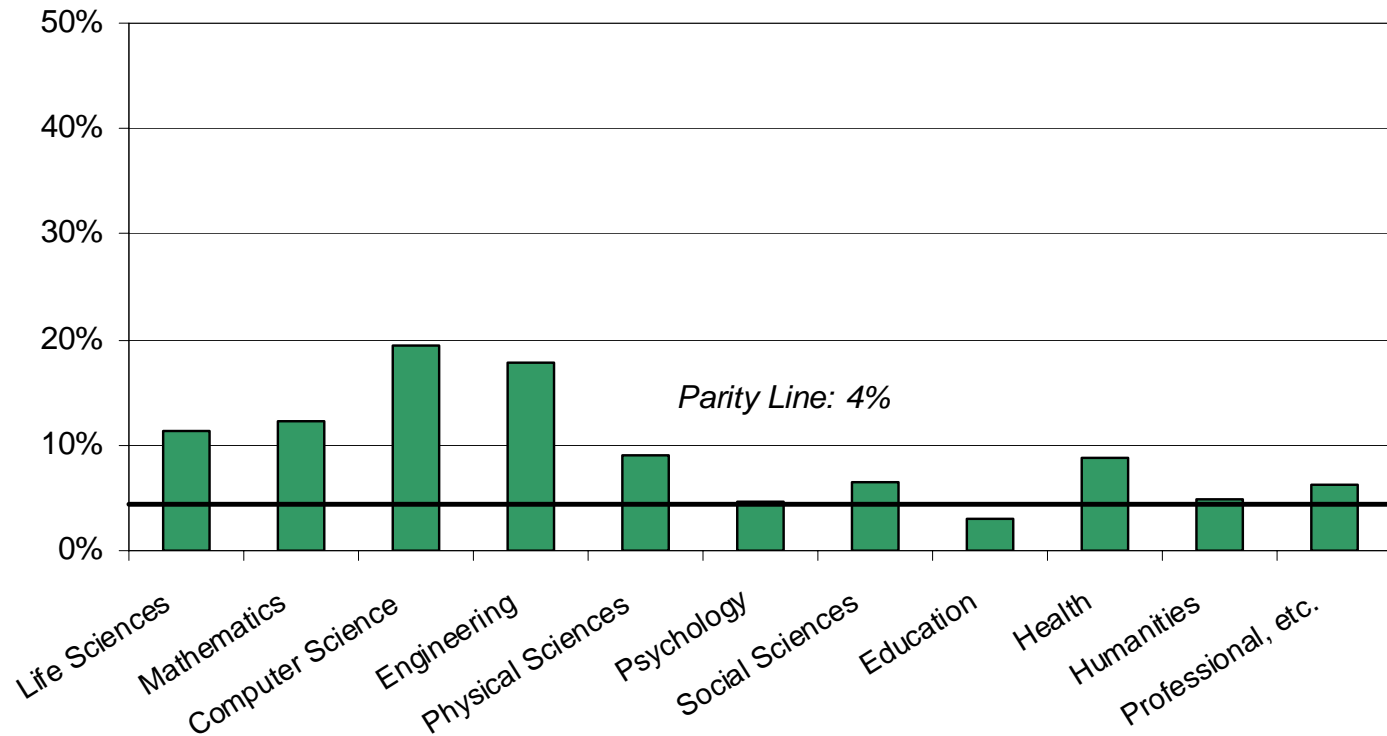
**Percent URM Among Doctorate Recipients,
U.S. Citizens and Permanent Residents, 2004**



Source: NSF Survey of Earned Doctorates, 2006. "Professional, etc." includes professional, unknown and other. URM includes African American, Hispanic, and American Indian.

Asian/Pacific Islanders are under represented only in Education – at or above parity in all other doctoral fields.

**Percent Asian/Pacific Islanders Among Doctorate Recipients,
U.S. Citizens and Permanent Residents, 2005**

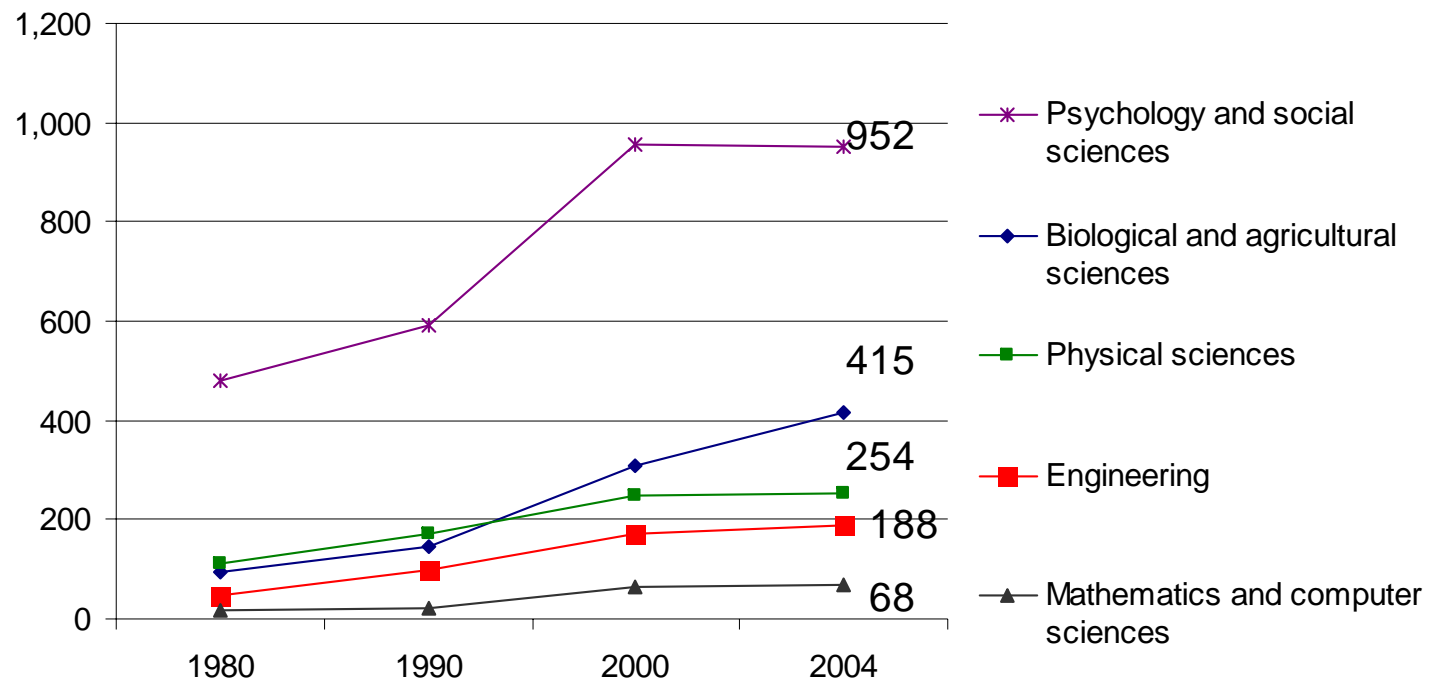


Source: NSF Science and Engineering Doctorate Awards: 2005. "Professional, etc." includes professional, unknown, and other.

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Since 1980 number of PhDs to URM in STEM fields just about doubled.

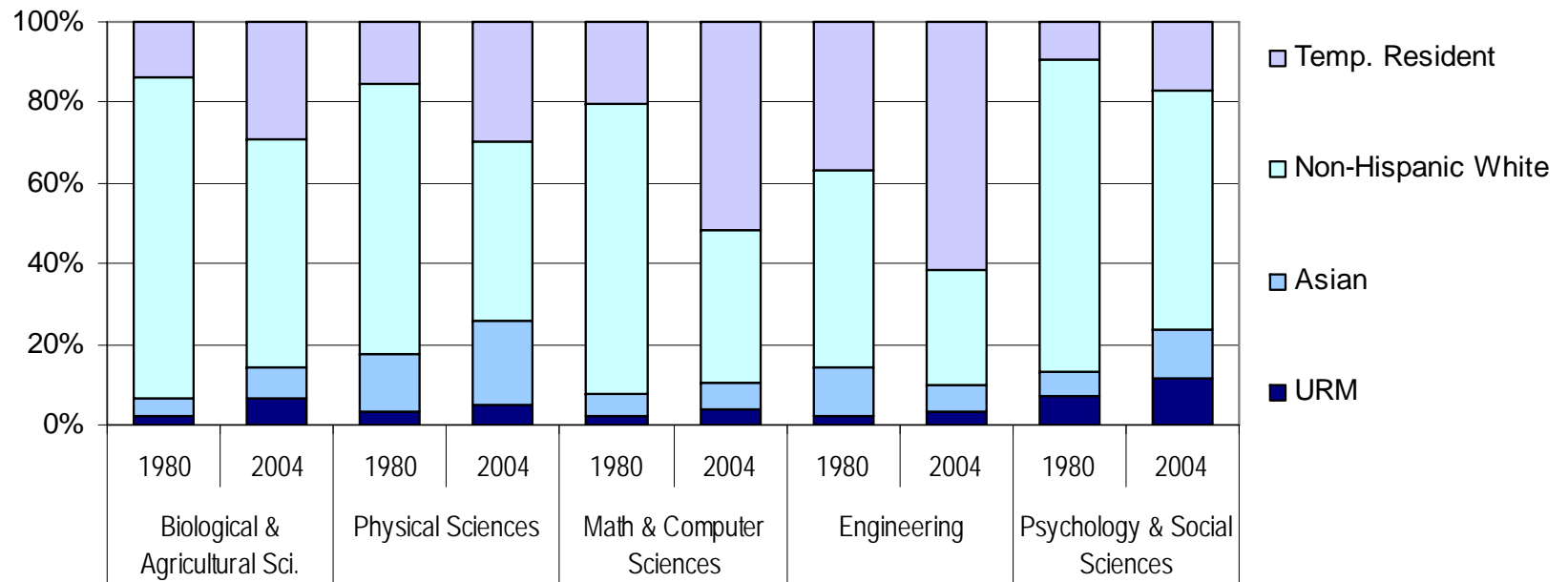
Number of PhDs Awarded to URM in Selected STEM Fields, Selected Years, 1980-2004



Source: CPST analysis of NSF WebCASPARE data.

Composition of doctorate recipients has changed . . .
 slightly higher percentage of URMs but substantially larger
 proportion of temporary residents

**Percent Doctoral Degrees in STEM Fields by Race/Ethnicity and
 Citizenship Status, 1980 and 2004**

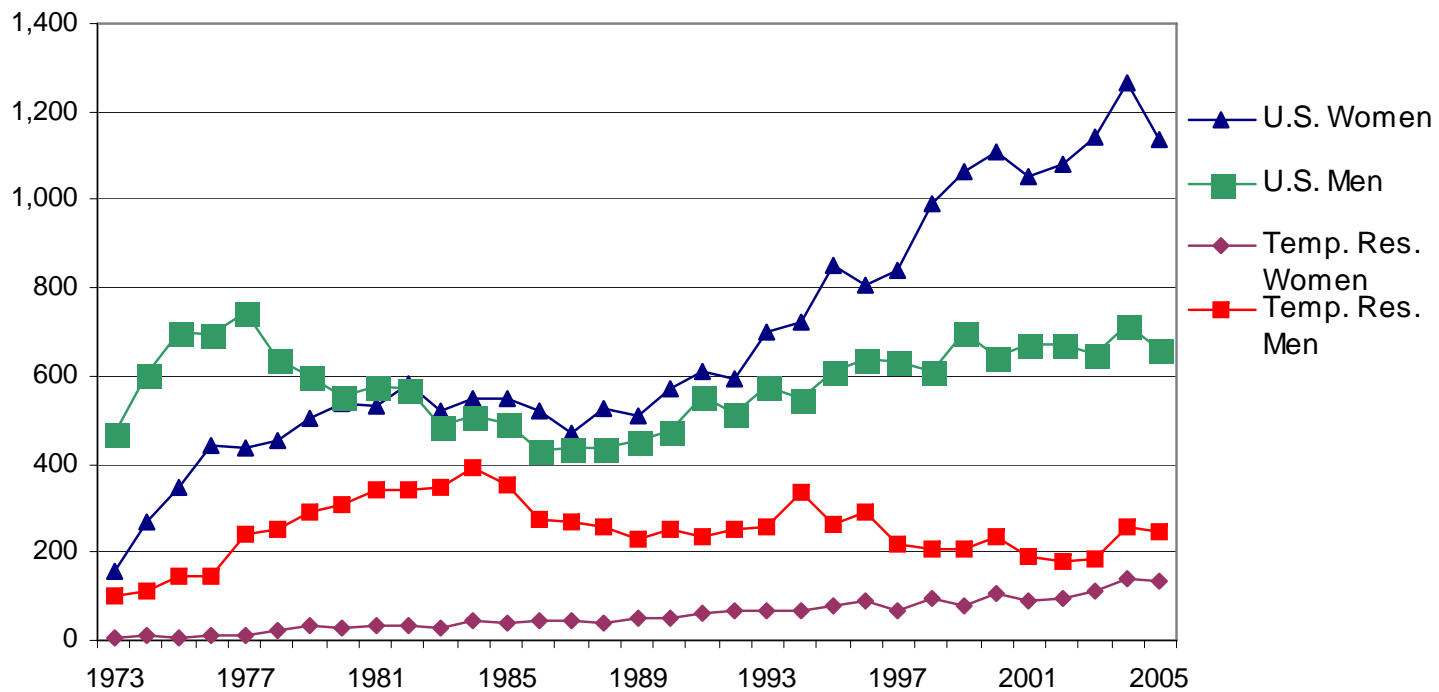


URM, Under represented minority, includes African American, American Indians, and Hispanics (and Hawaiian and Other Pacific Islanders in 2004)

Source: CPST, derived from the National Science Foundation WebCASPAR database.

Controlling for citizenship status: increase: U.S. African American women but relatively STAGNANT number to U.S. African American men.

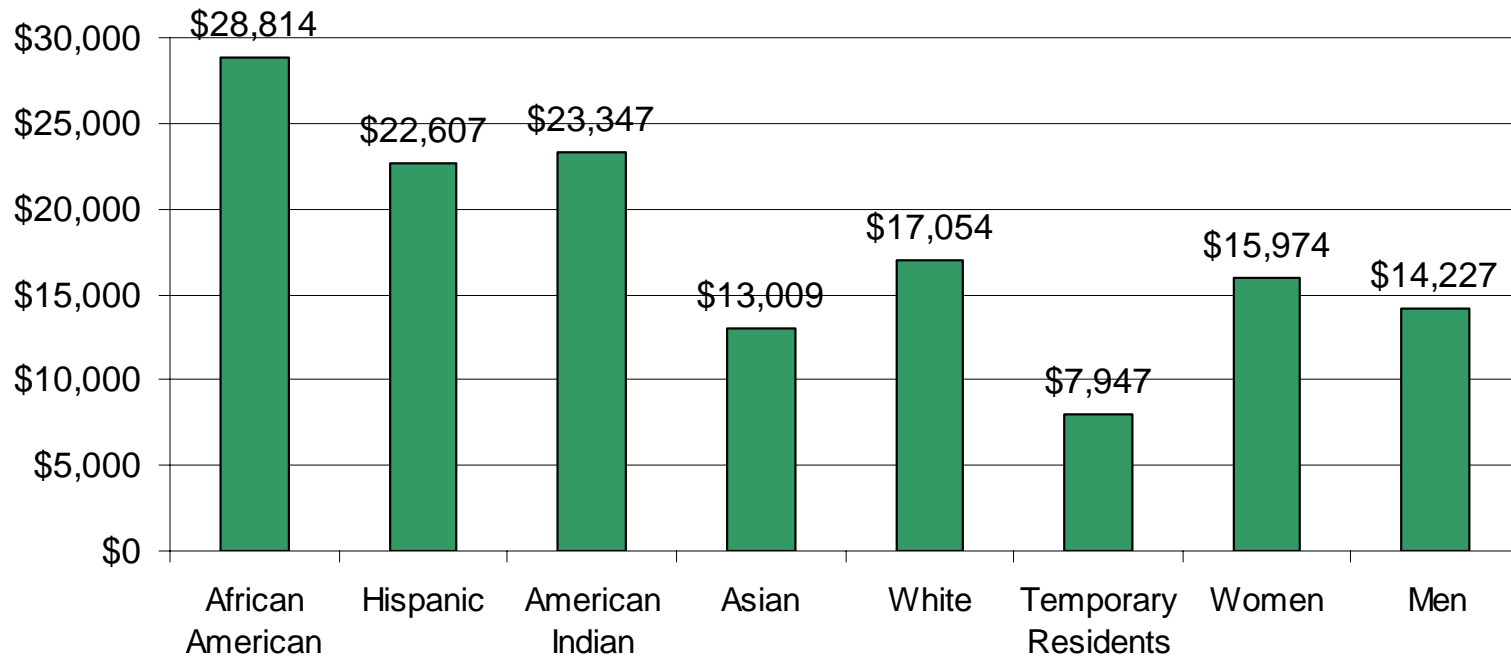
Number of African American Doctorate Recipients from U.S. Institutions, by Citizenship Status and Gender, 1973-2005



Source: CPST analysis of National Science Foundation WebCASPAR data.

URMs start post-PhD careers with higher levels of debt than non-URMs

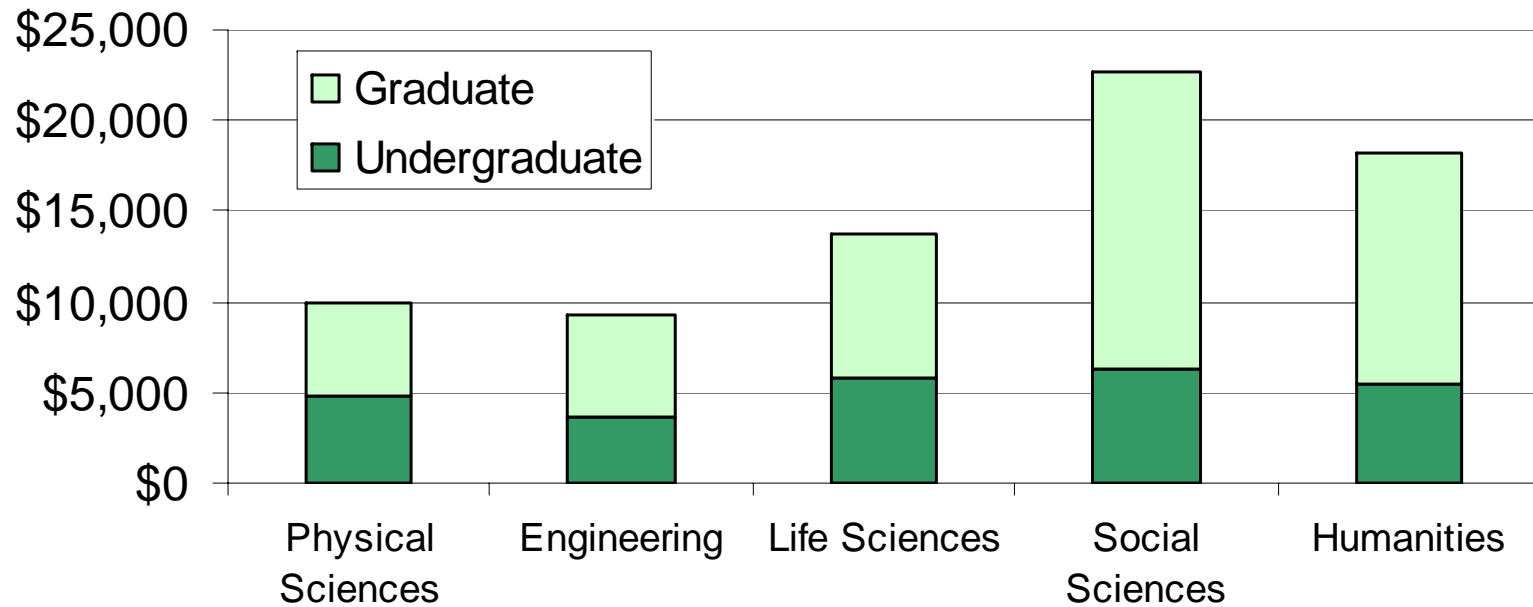
Mean Debt by Demographic Group



Source: CPST analysis of NSF Survey of Earned Doctorates data.

Financing graduate education differs by field. Less sources of support for social sciences and humanities means more debt upon graduation.

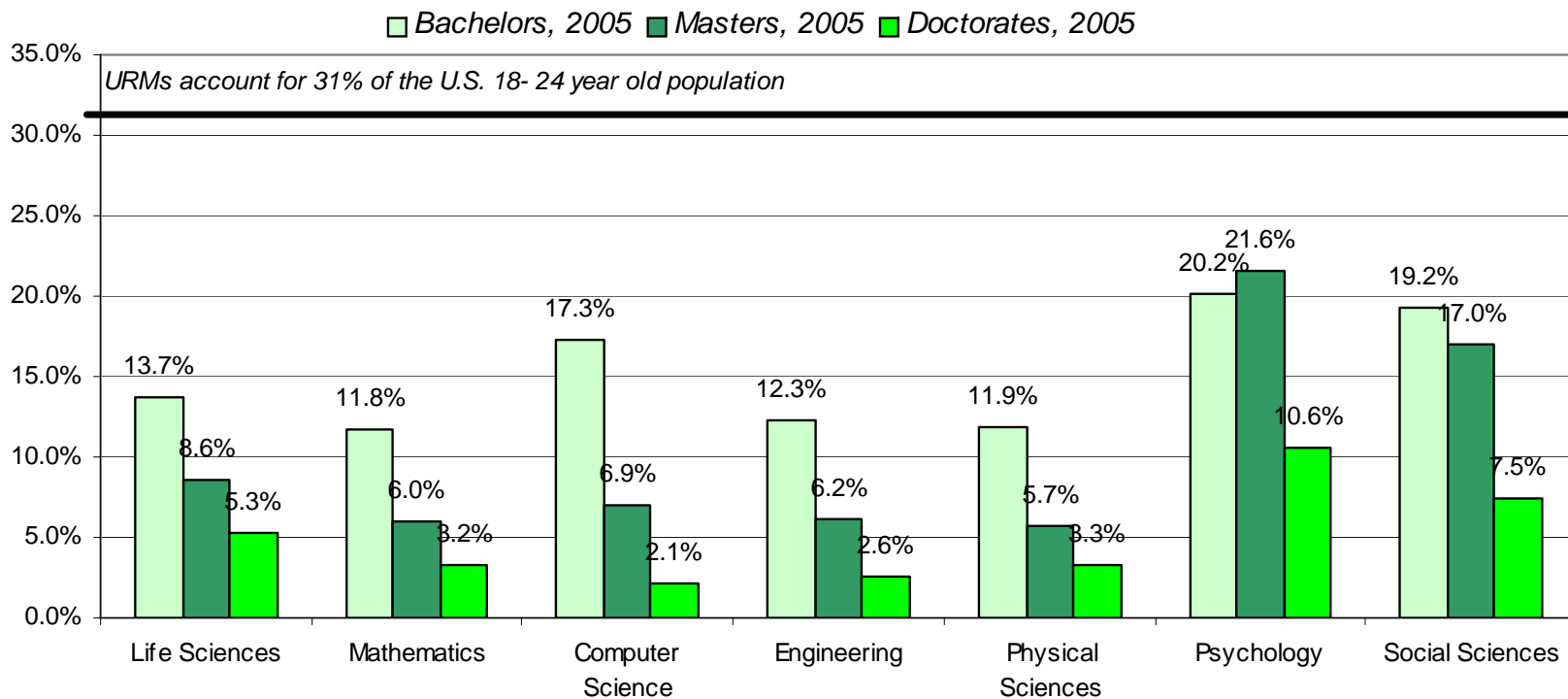
Mean Debt by Field



Source: CPST analysis of NSF Survey of Earned Doctorates data.

The URM "Pipeline" to the Ph.D. is far from "parity" with URM representation in the U.S. population.

Percent URM by Field and Degree Level, 2005 Degree Conferrals



URM= Under Represented Minorities, includes African Americans, American Indians/Alaska Natives, and Latinos/as.

Findings from the National Study of Postsecondary Faculty, 2004

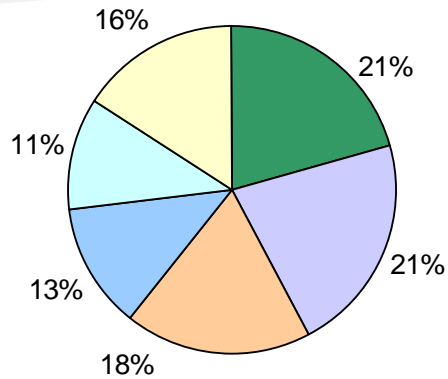
Reference date: Fall 2003

NSoPF is a Larger Faculty Universe than NSF or Nelson

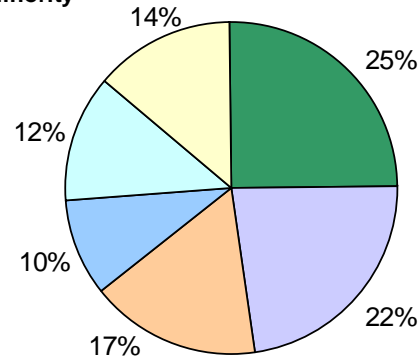
- 2-year and community colleges
- Non-U.S. doctoral degrees
- Degrees below the doctorate

URM and Non-Minority faculty are comparably distributed across fields but Asian faculty are more highly concentrated in natural sciences, engineering, and health sciences.

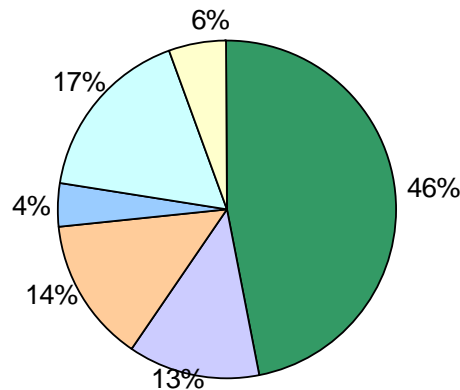
URM



Non-Minority

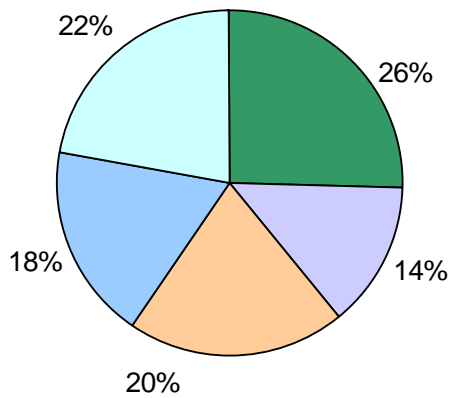


Asian

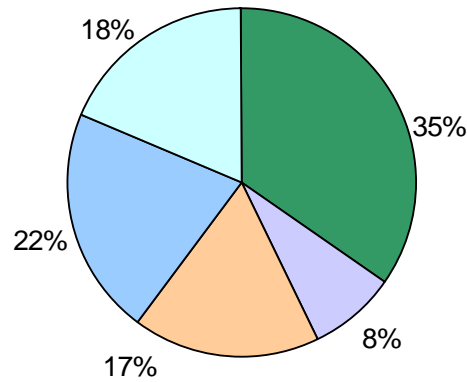


Within the natural sciences and engineering, URM faculty are more likely to be in engineering, computer science, and mathematics than Non-Minority faculty and less likely to be in life sciences.

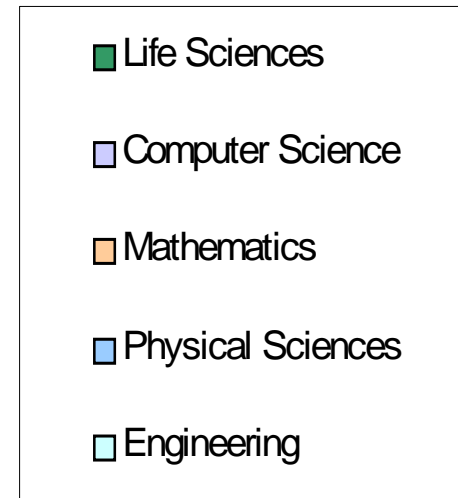
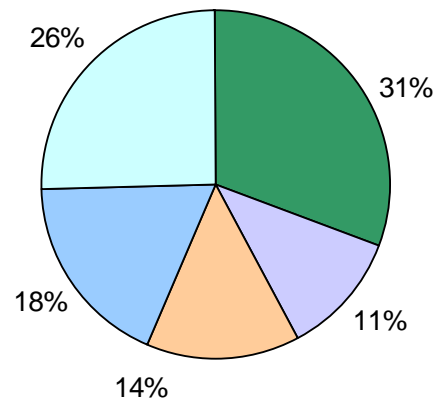
URM



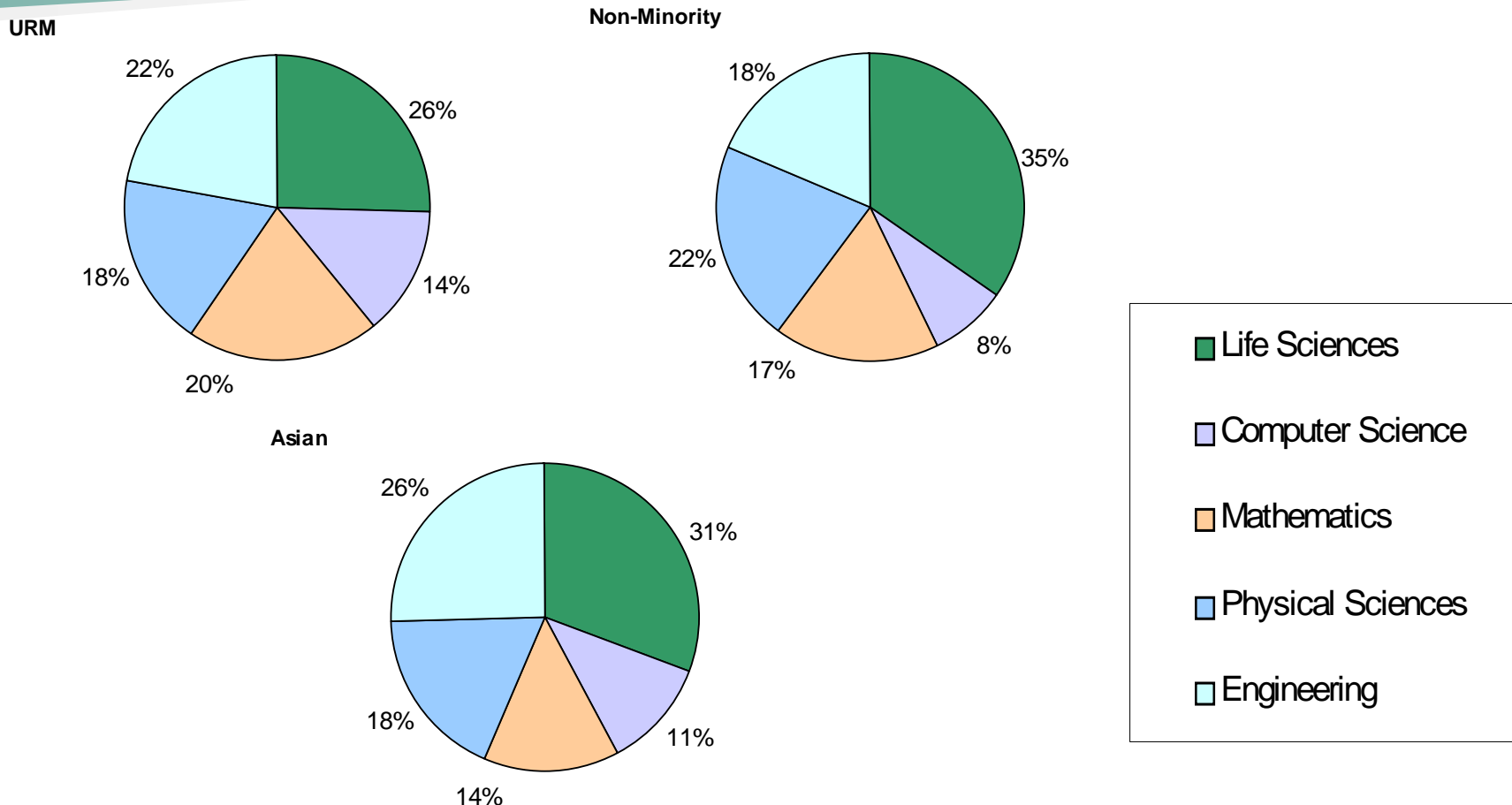
Non-Minority



Asian

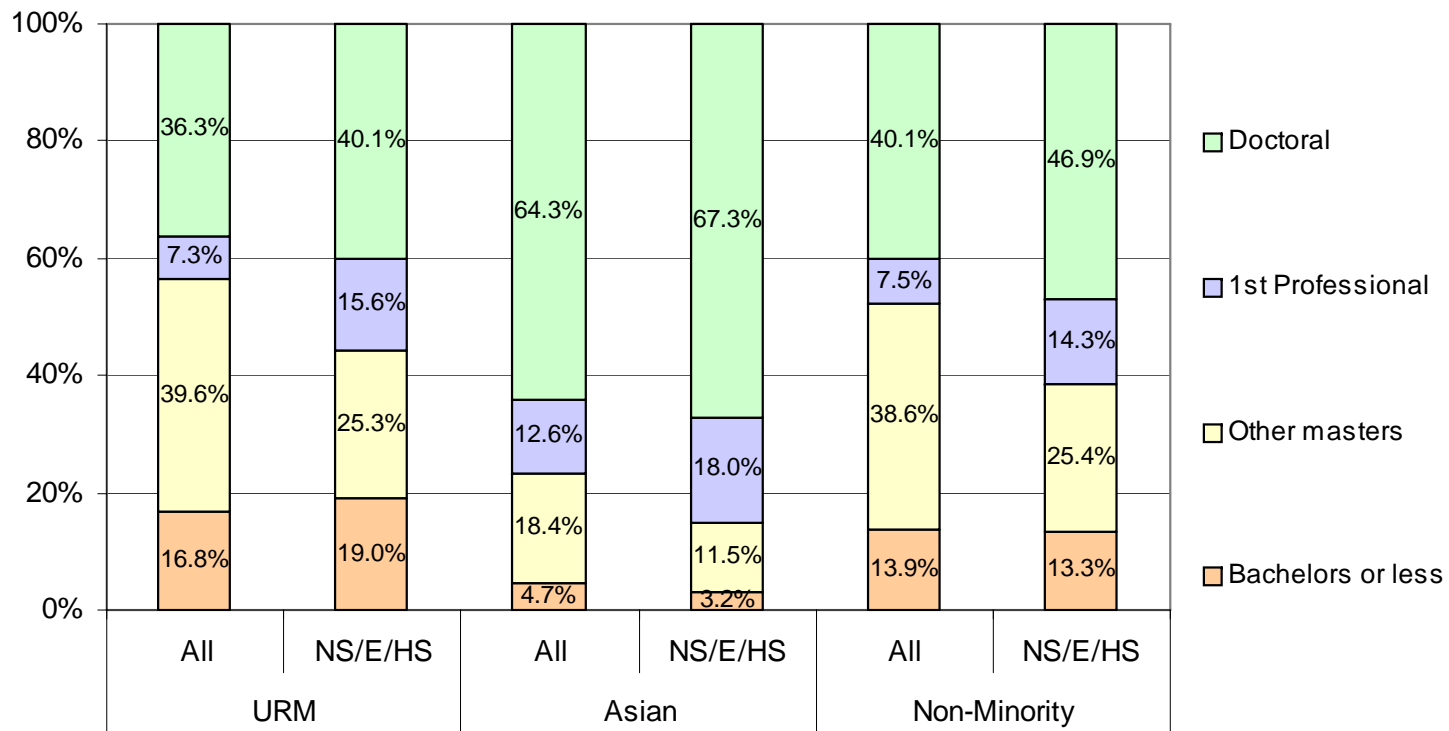


Within the natural sciences and engineering, Asian faculty are slightly more likely to be in engineering and computer science, but less likely in mathematics than URM faculty.



Natural science and engineering faculty are more likely to hold doctoral degrees. Asian faculty are most likely to hold doctoral degrees.

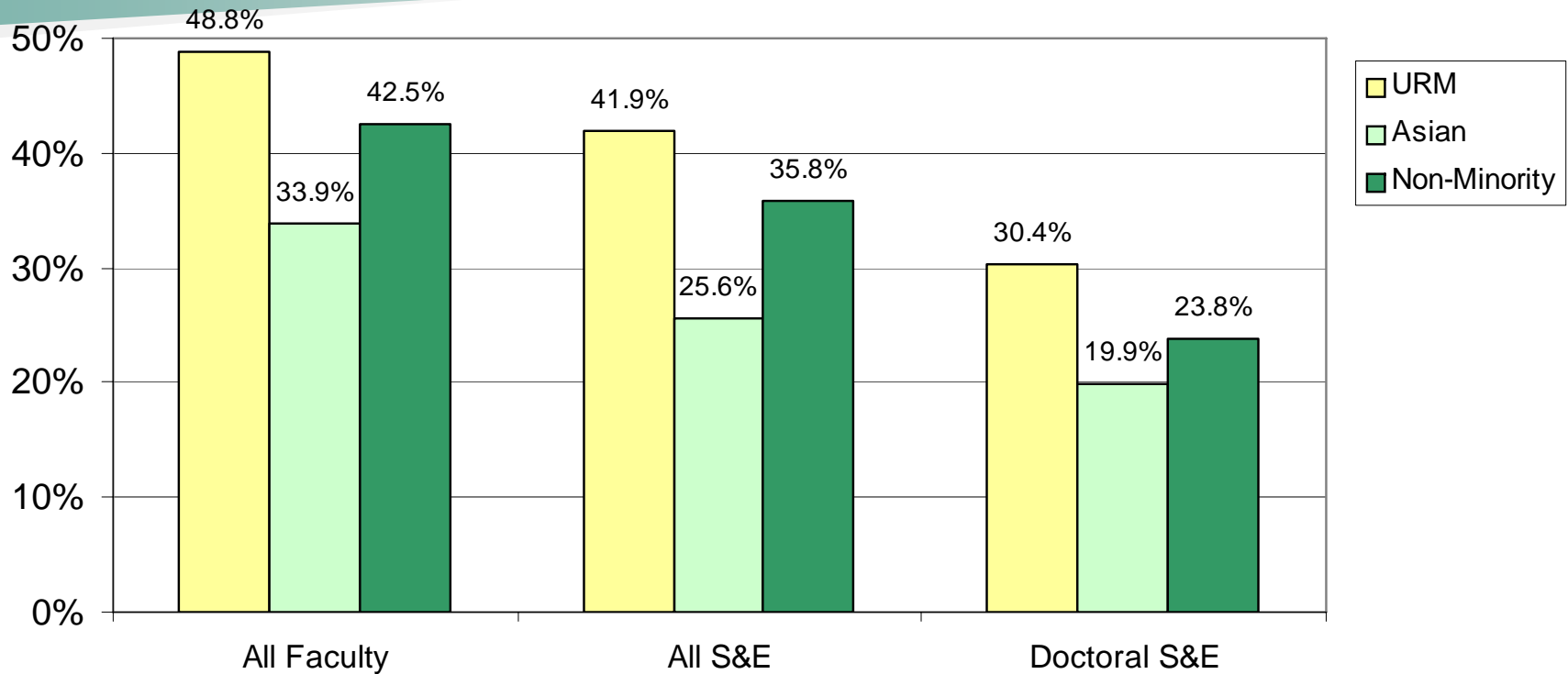
**Highest Degree of Faculty by Ethnicity and Field, NSoPF 2004
Weighted Analysis**



Source: CPST analysis of National Study of Postsecondary Faculty, 2004. "NS/E/HS" refers to the natural sciences, engineering and health sciences.



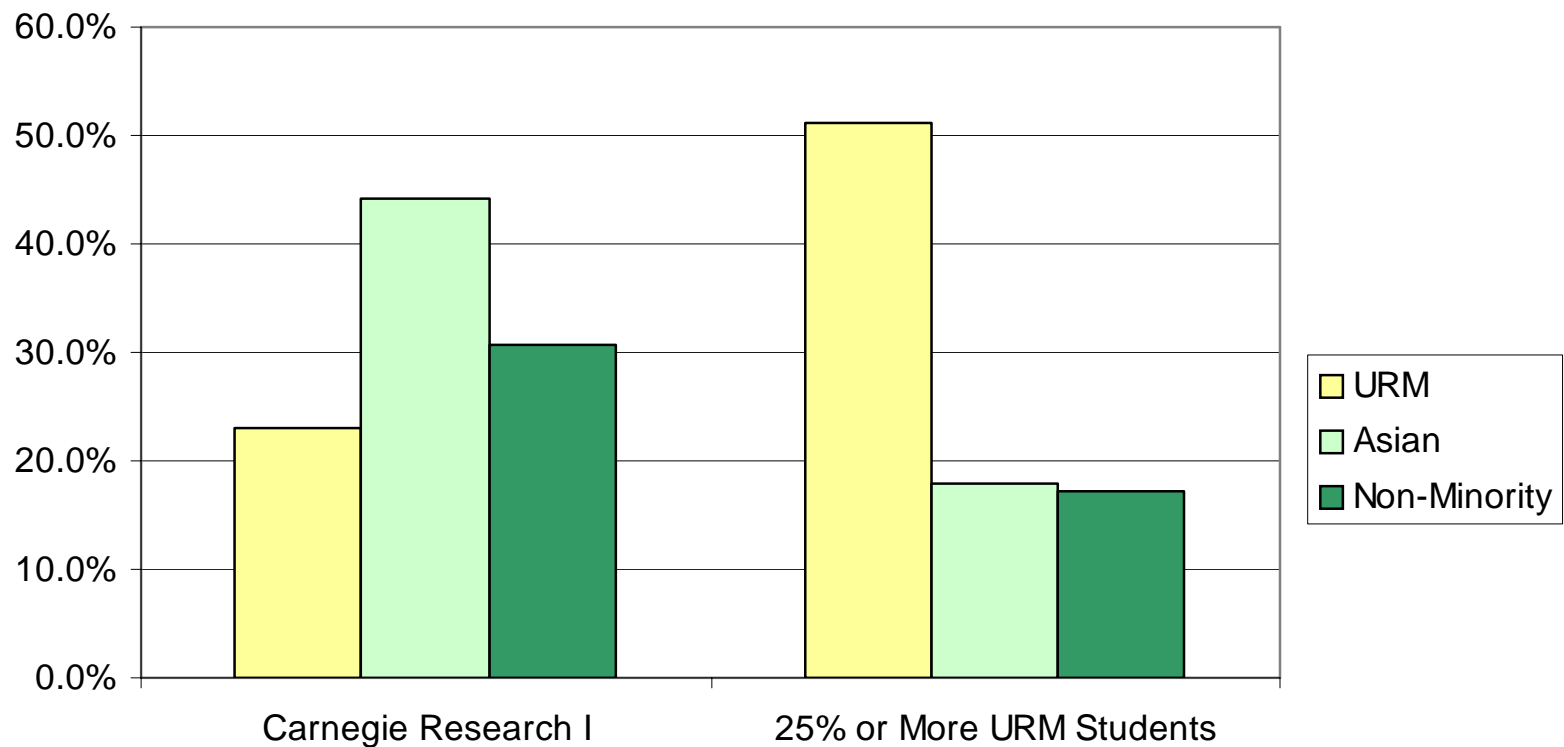
Percent Female by Ethnic Group and Sample



Source: CPST analysis of NSOPF 2004 weighted data. S&E includes natural, physical, and health sciences and engineering.

URM faculty are less likely to be at Carnegie R1s than Asian or Non-Minority faculty and more likely at schools that serve URM students.

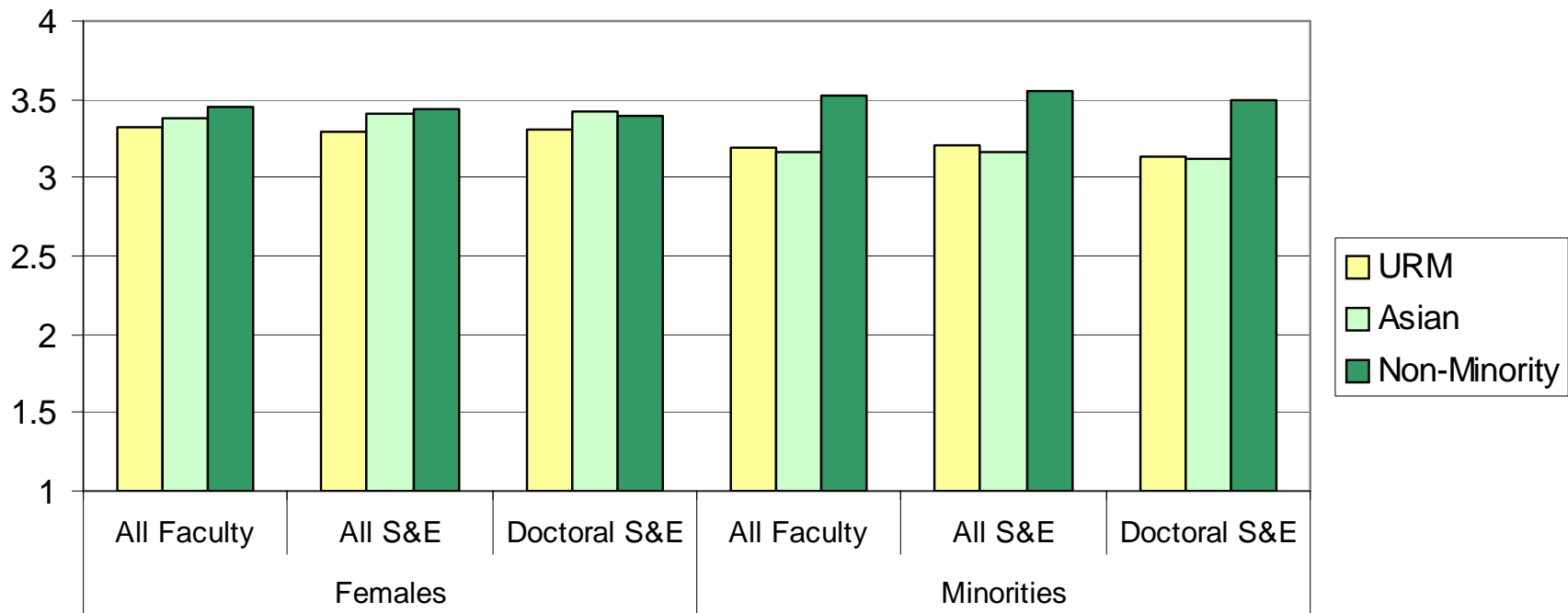
Characteristics of Current Institution, All S&E Faculty by Ethnicity



Source: CPST analysis of NSOPF 2004 weighted data. S&E includes natural, physical, and health sciences and engineering.

Most faculty agree that females are treated fairly but URM and Asian faculty are less likely than Non-Minority faculty to agree that minorities are treated fairly.

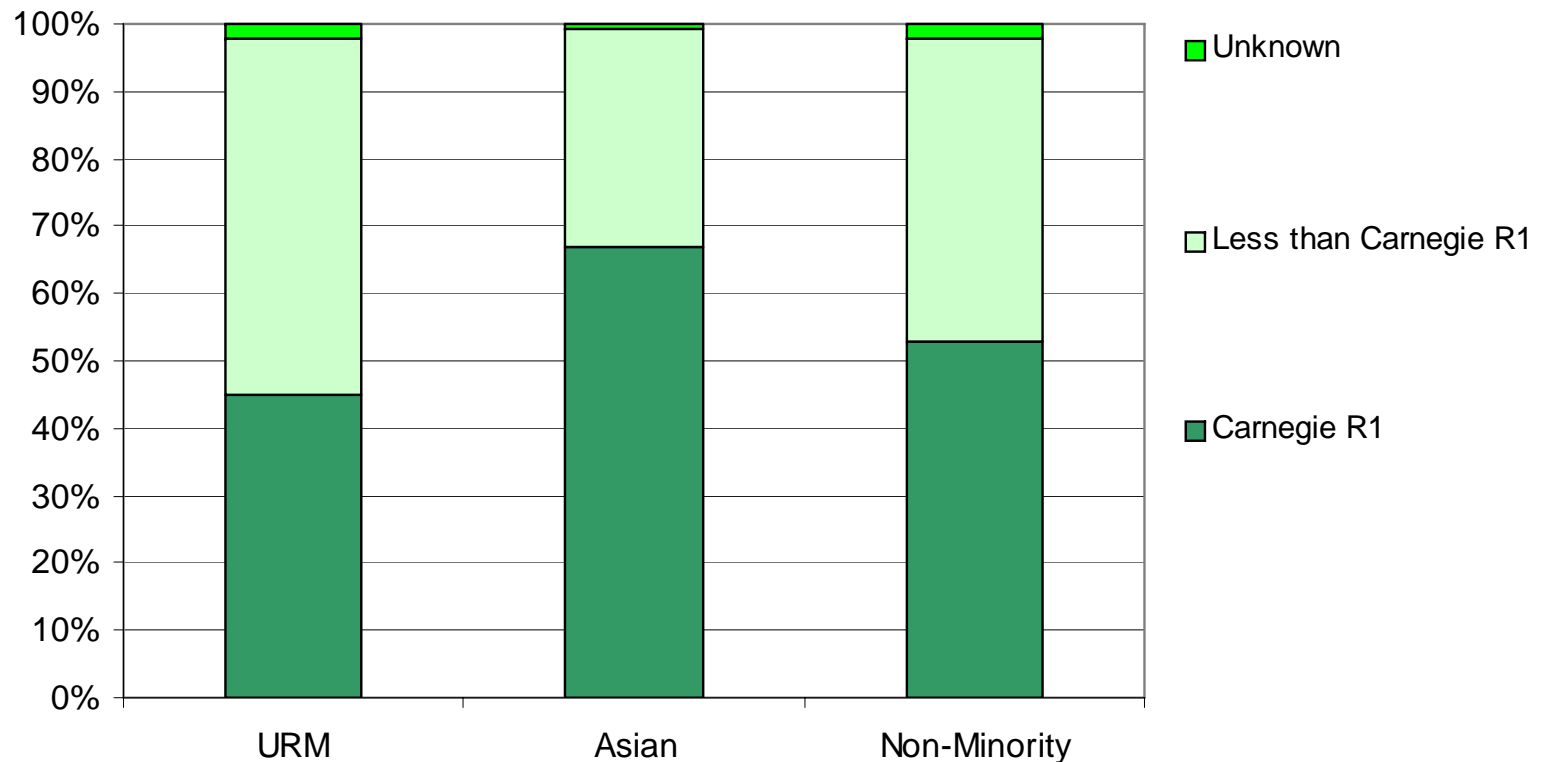
Mean Agreement That Group is Treated Fairly, by Respondents' Ethnicity
 1 = Strongly Disagree to 4 = Strongly Agree



Source: CPST analysis of NSOPF 2004 weighted data. S&E includes natural, physical, and health sciences and engineering.

Almost all Asian faculty received US doctoral degrees.
URMs most likely to earn doctoral degree at non-R1s.

Characteristics of Doctoral Institution
Natural, Physical and Health Sciences and Engineering Faculty



Source: CPST analysis of NSOPF 2004 weighted data.



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Doctoral degreed S&E minority faculty are less satisfied with salary and overall as compared to Non-Minority faculty. URM faculty slightly less satisfied with workload.

Mean Level of Satisfaction with Job Elements by Ethnicity of Respondents, Doctoral-Degreed S&E Faculty
1 = Very Dissatisfied to 4 = Very Satisfied



Source: CPST analysis of NSOPF 2004 weighted data. S&E includes natural, physical, and health sciences and engineering.



Thanks!

CPST acknowledges the generous support of the Alfred P. Sloan Foundation for the project “Minorities and Non-Minorities in Academia: A Natural Science and Engineering Career Path Comparison.” We would like to thank our program officer, Ted Greenwood for his passionate interest in this project. The views expressed are those of the author and do not reflect those of the Alfred P. Sloan Foundation or its officers.