

Increasing Opportunities for Women in U.S. Science and Engineering: Contemporary Issues and Trends

**EARMA: Successful Initiatives in Modern Human Resource
Management to Promote Equal Opportunities in Science and
Science Management**

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U.S. Women in Science and Engineering: Issues

- Pipeline
- Retention at the undergraduate level and graduate school
- Lack of role models and “glass ceiling” problem



Pipeline Issue: Causes

→ Environmental factors from Childhood to pre-college

 cultural issues

 specialization of young girls

 peer pressure

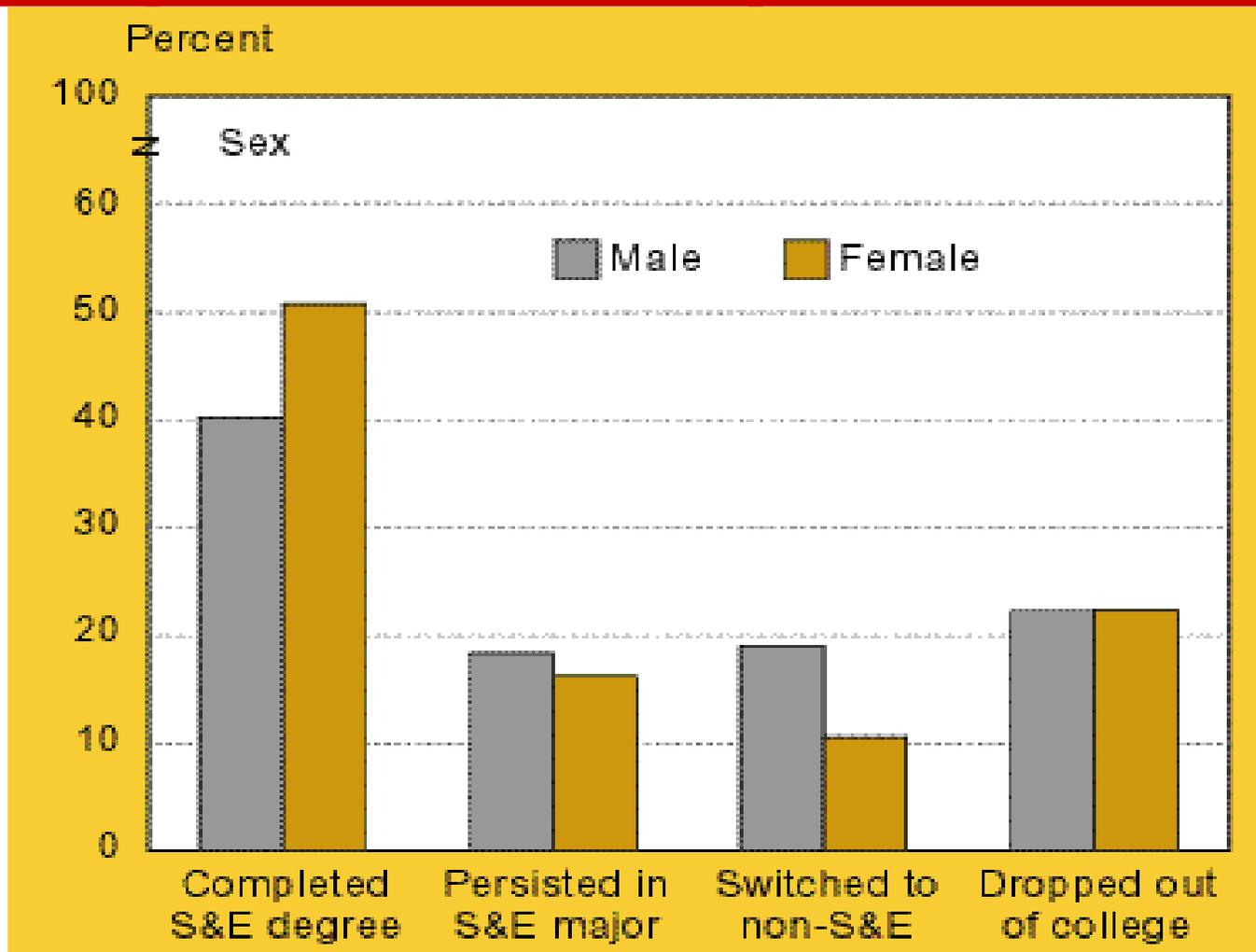
 media portrayals

 role models

 lack of knowledge about careers



Completion and Attrition Rates 5 Years After Beginning an S&E Major, by Race/Ethnicity and Sex



SOURCE: National Center for Educational Statistics (NCES), Beginning Postsecondary Student (BPS) Longitudinal Study (Washington, DC: 1996). (Based on subsample of 926 first-year S&E students in 1990 and 1995 follow-up.) *Science & Engineering Indicators - 2000*

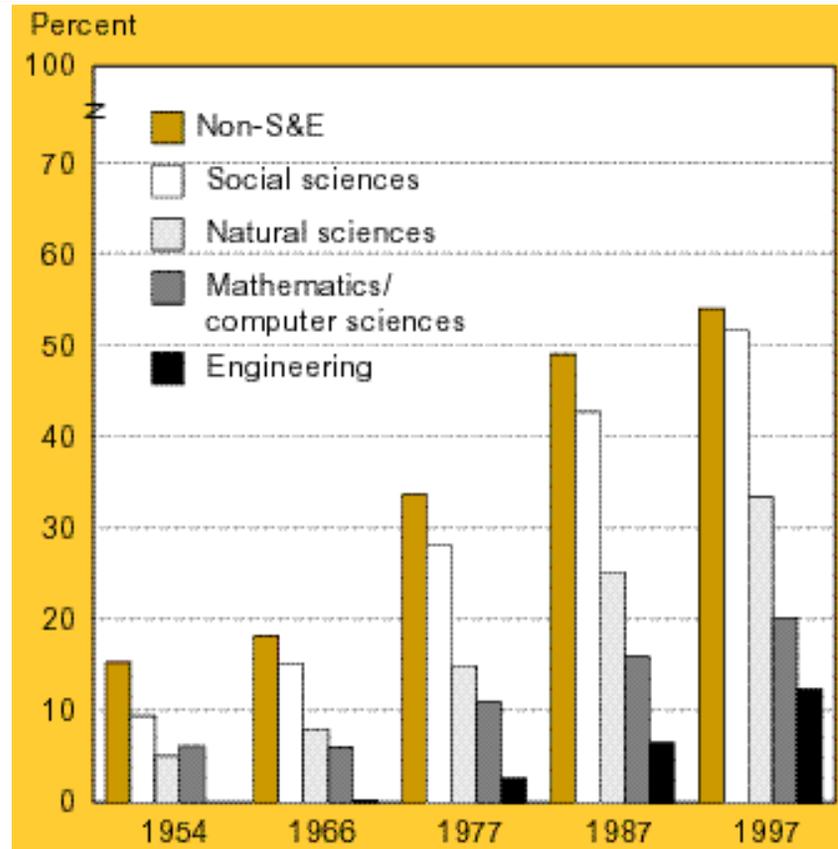


Degrees Conferred to Women

Degrees Conferred	1900	Mid-1970s	2000
Total Baccalaureate	27,410	917,900	1,185,000
% Women	19%	46%	56%
Total Masters	1,583	311,771	430,164
% Women	19%	46%	57%
Total Doctoral	382	34,064	41,368
% Women	6%	23%	44%



Proportion of Doctoral Degrees Earned by Women in U.S. Universities, by Field



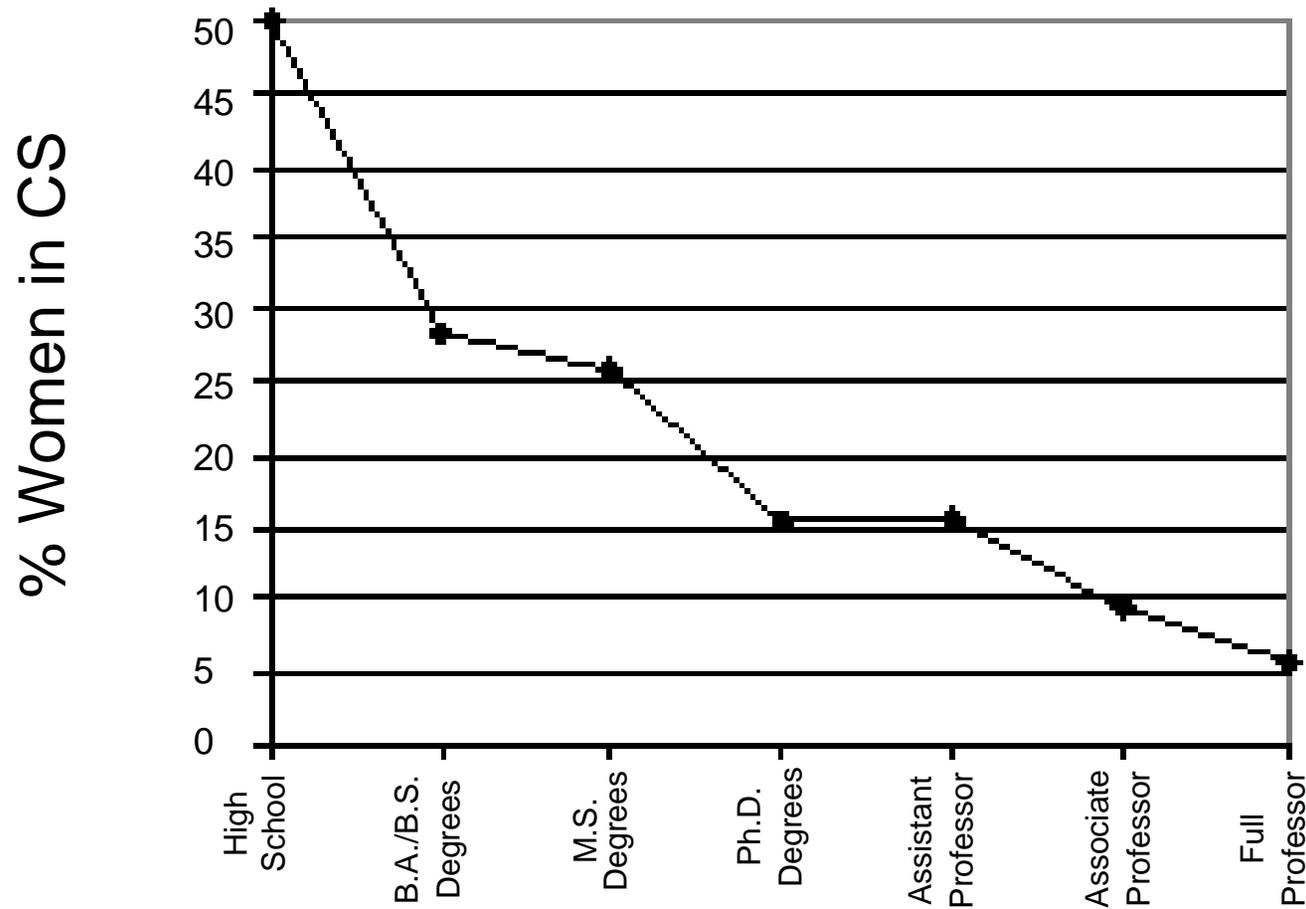
NOTE: Natural Sciences include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences. Social sciences include psychology, sociology, and other social sciences.

SOURCE: U.S. Department of Health, Education, and Welfare, *Statistics of Higher Education: Faculty, Students, and Degrees 1953-54* (Washington, DC: U.S. Government Printing Office); National Science Foundation, Science Resources Studies Division, *Science and Engineering Degrees, 1966-96*. NSF 99-330, Author, Susan T. Hill (Arlington, VA); and appendix table 4-25.



Women in Computer Science

The Shrinking Pipeline 1993-94



National Science Foundation's (NSF) Activities Aimed at Increasing Representation of Women in Science and Engineering

- Activities at K-12 Level
- Emphasis on mentoring and role models
- Special workshops and studies
- Targeted programs
- Review emphasis on broader impacts
- Inclusion of female researchers at all levels of NSF's activities

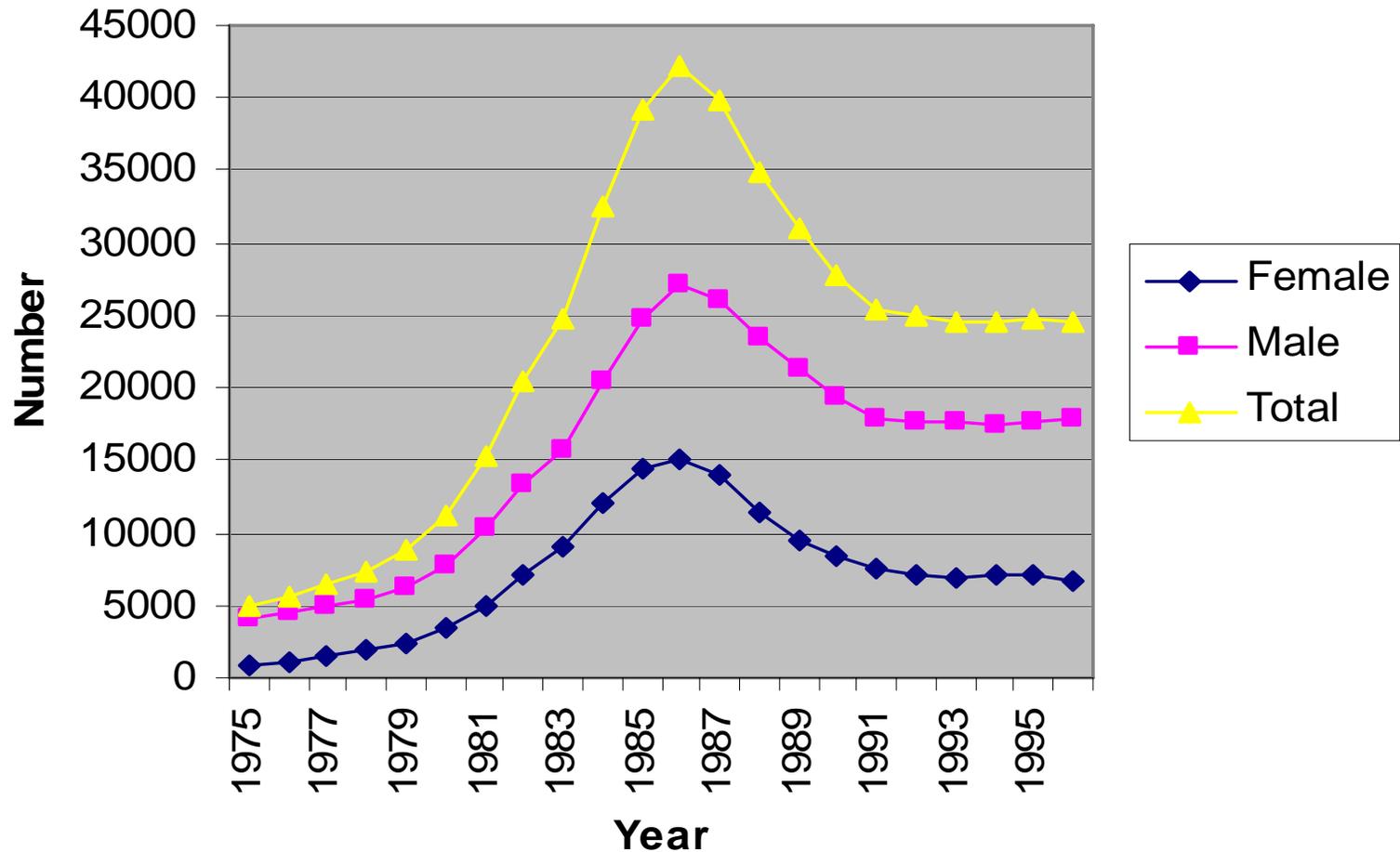


Distributed Mentor Project: Increasing the Number of Women Entering Graduate School in Computer Science and Engineering

- Project started in 1994
- Involves undergraduate women in research under guidance of a female mentor
- 50% of the students who participate in the program end up enrolling in graduate or professional school the year following their graduation (this compares 2.53% of female students with the same average)



Computer Science Bachelor Degree Statistics



Sources: Virtual Workshop Report, "Research Foundations for Improving the Representation of Women in the Information Technology Workforce (held September 27, 1999 - November 5, 1999)", submitted by Doris L. Carver, Dept. of Computer Science, Louisiana State University, Baton Rouge, LA 70803, May 29, 2000.

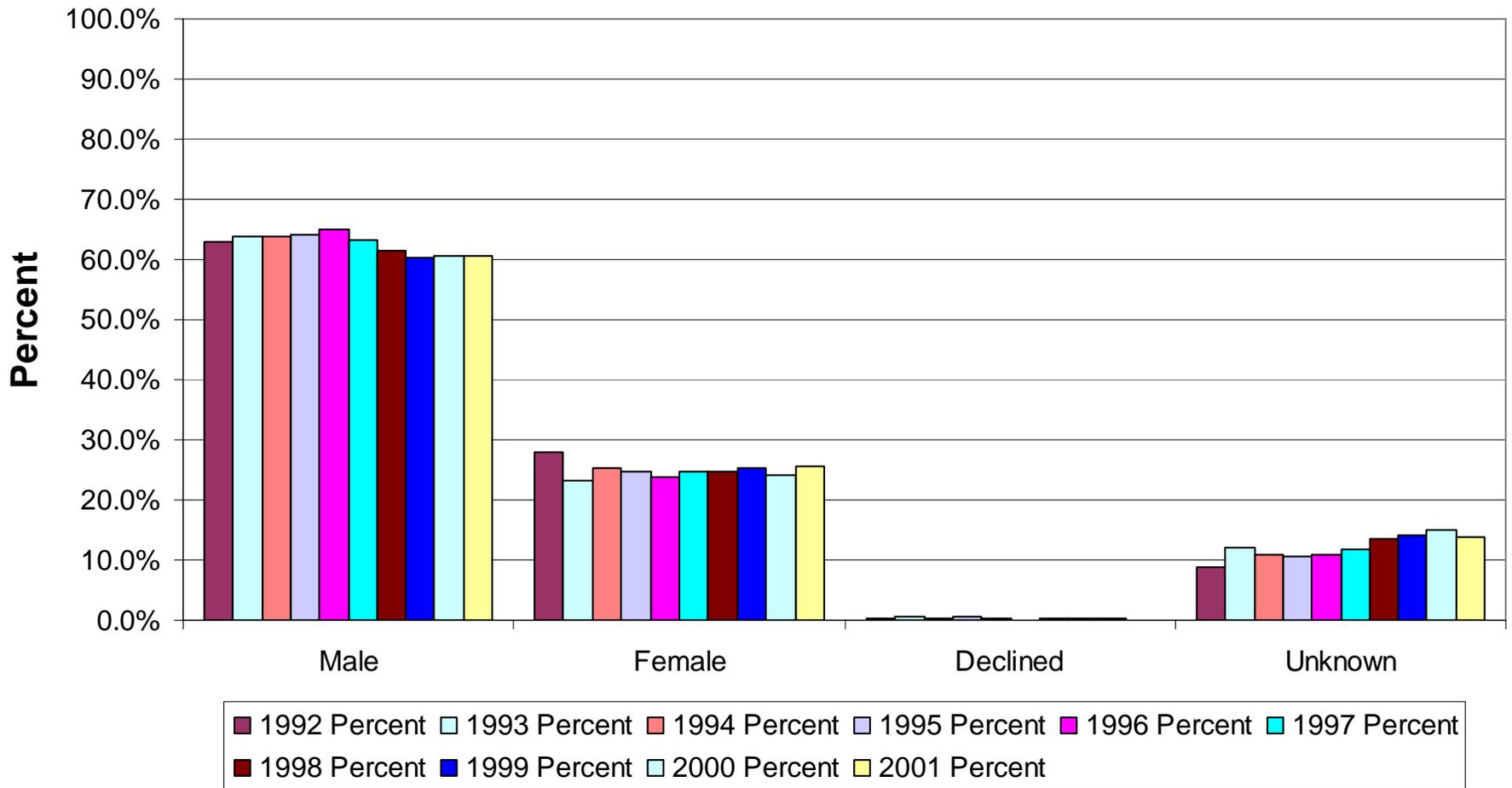


Faculty, by Gender

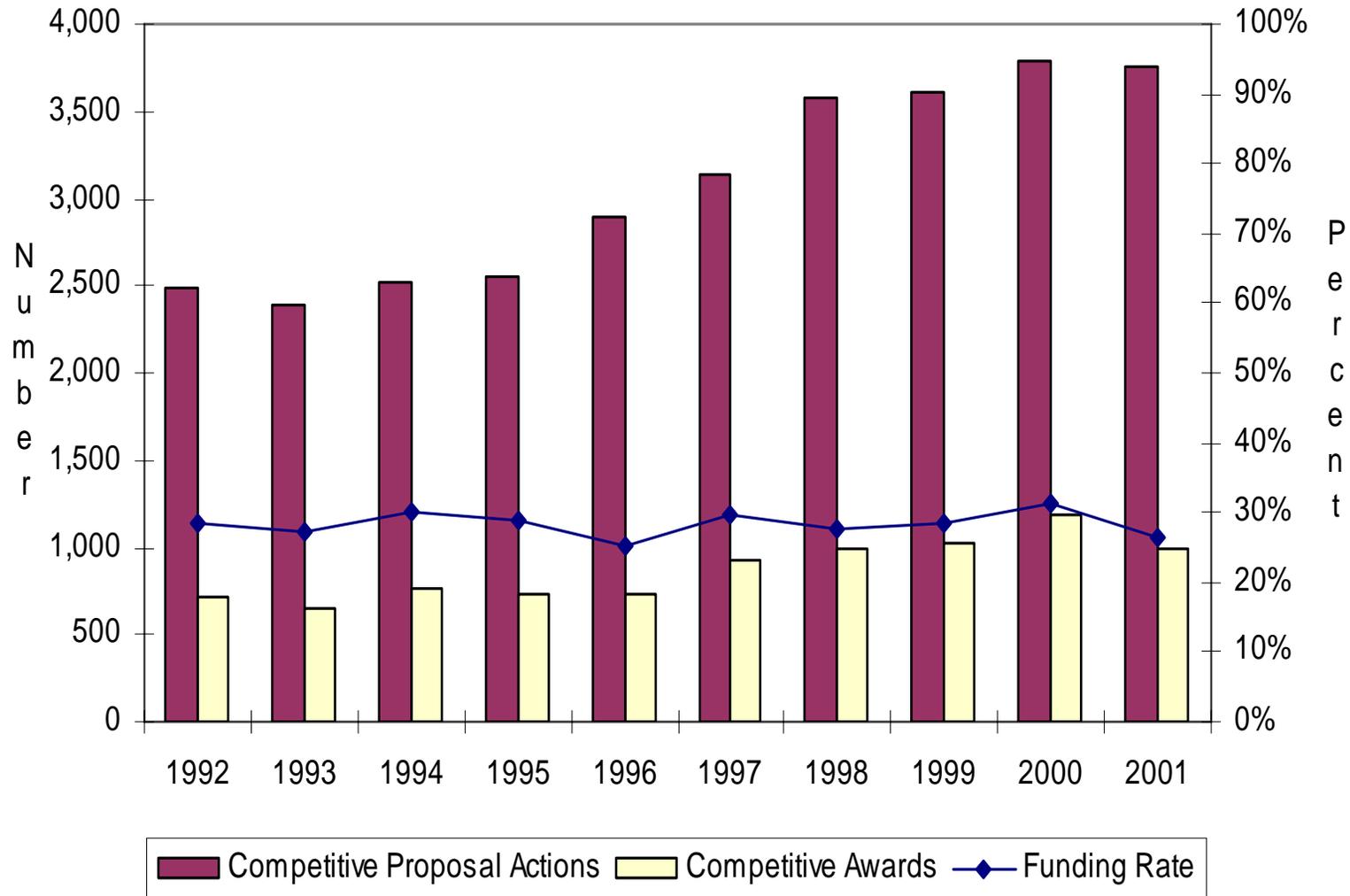
	1972		1998	
	Women	Men	Women	Men
Total Faculty	21%	79%	41%	59%
Full-Time Faculty	25%	75%	36%	64%
Part-Time Faculty	34%	66%	45%	55%
Full-Time Faculty at Research Universities	18%	82%	25%	75%
Tenured (among full-time faculty)	38%	58%	39%	59%
Full Professors	10%	90%	24%	76%
Full Professors in Science & Engineering	2.5%	97.5%	10%	90%



NSF Project Report Demographics



NSF Funding Rate for Competitive Awards - Competitive Research Grants-Gender - Female

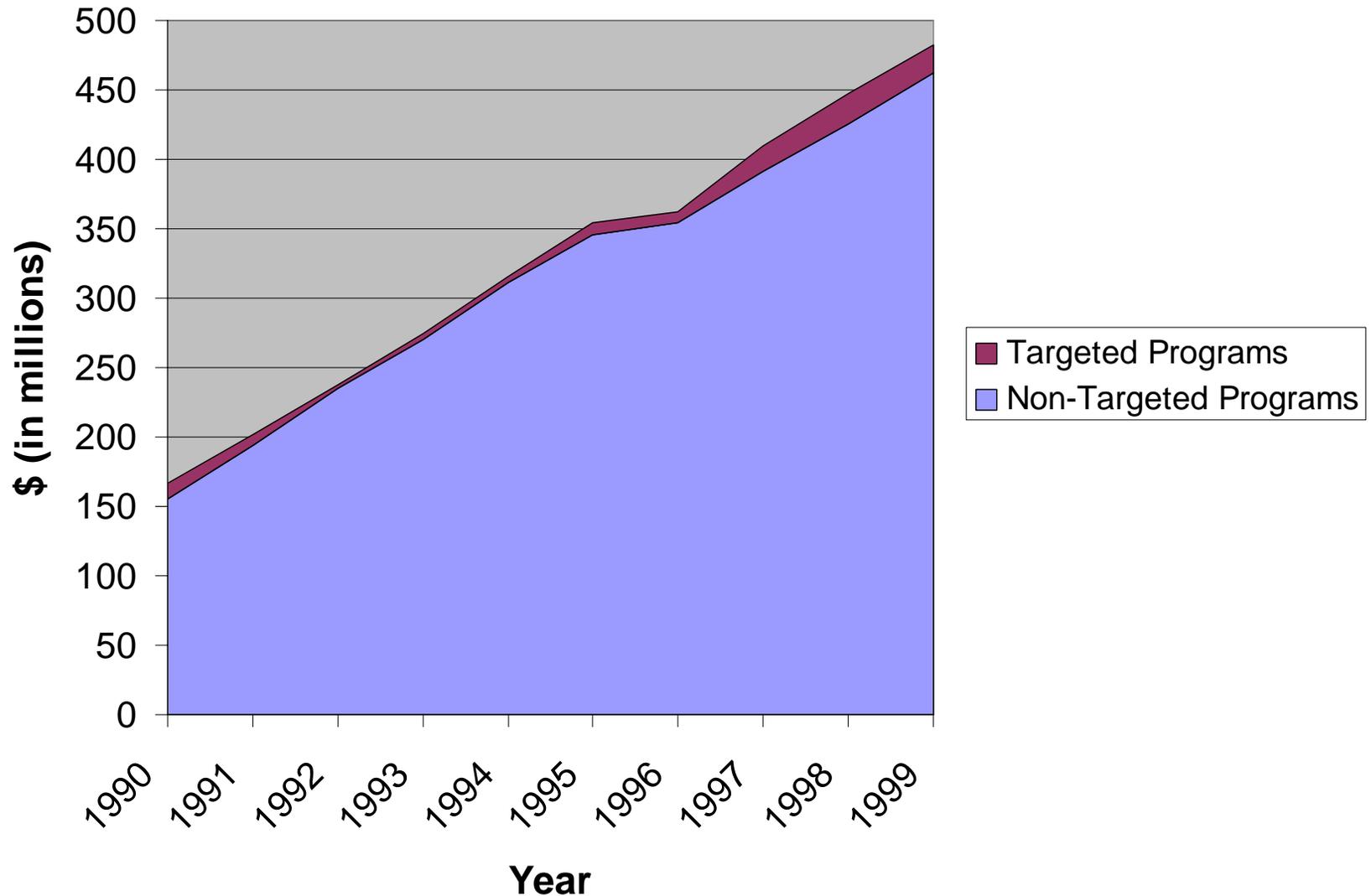


ADVANCE Program

- Objective to increase the participation of women in the scientific and engineering workforce through the increased representation and advancement of women in academic science and engineering careers
- Support for
 - 📄 Fellows
 - 📄 Institutional Transformation Awards
 - 📄 Leadership Awards



NSF Support for Women PIs



Useful URLs

- Distribution Mentor Program
<http://www.cra.org/Activities/craw/dmp/>
- ADVANCE Program
<http://www.nsf.gov/home/crssprgm/advance>
- Professional Opportunities for Women in Research and Education
<http://www.nsf.gov/home/crssprgm/powre/start.htm>
- Virtual Workshop on Women in Information Technology <http://www.cise.nsf.gov/itwomen.html>

