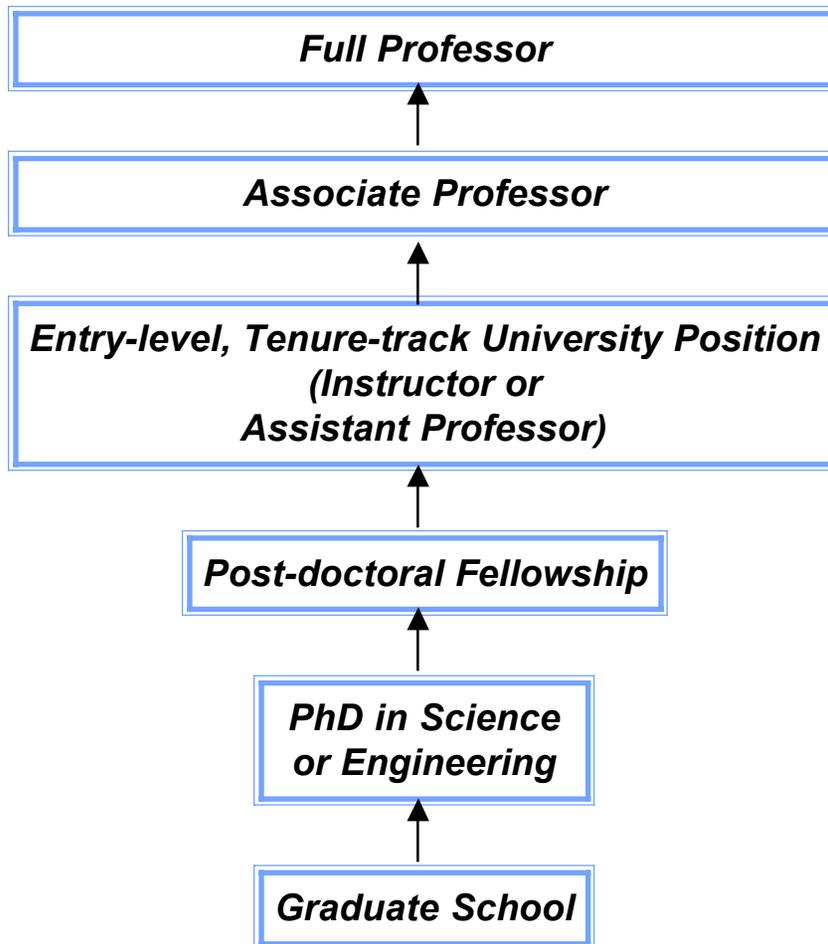


# PATHWAYS TO A CAREER IN SCIENCE & ENGINEERING

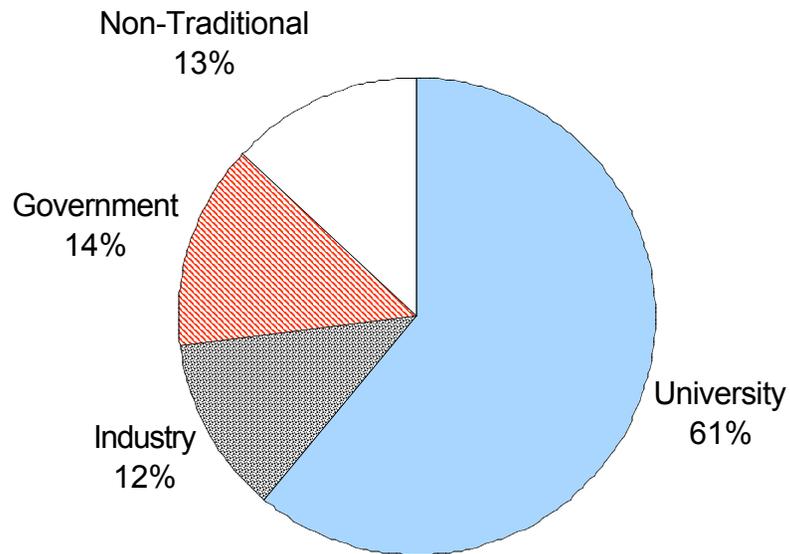
# University Pathway



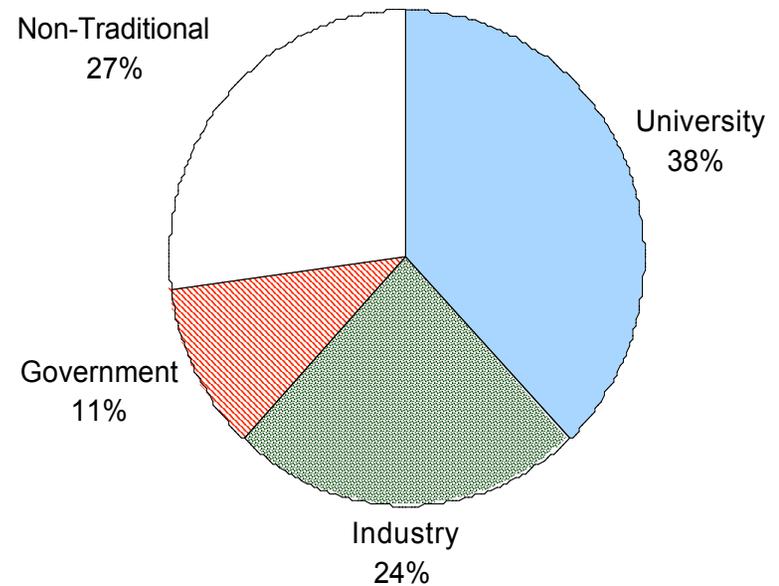
How many PhDs in life sciences do you think end up with full-time employment on the tenure track at a university?

# Changing Climate

## Employment of Life Science PhDs Ten Years After Degree



**1973-74**  
**(PhD awarded 1963-64)**



**1995-96**  
**(PhD awarded 1985-86)**

# Growth in Number of Degrees

Number of PhDs  
awarded in Science &  
Engineering in US

<b>Year</b>	<b>No.</b>
1967	13,109
1977	18,008
1997	28,847

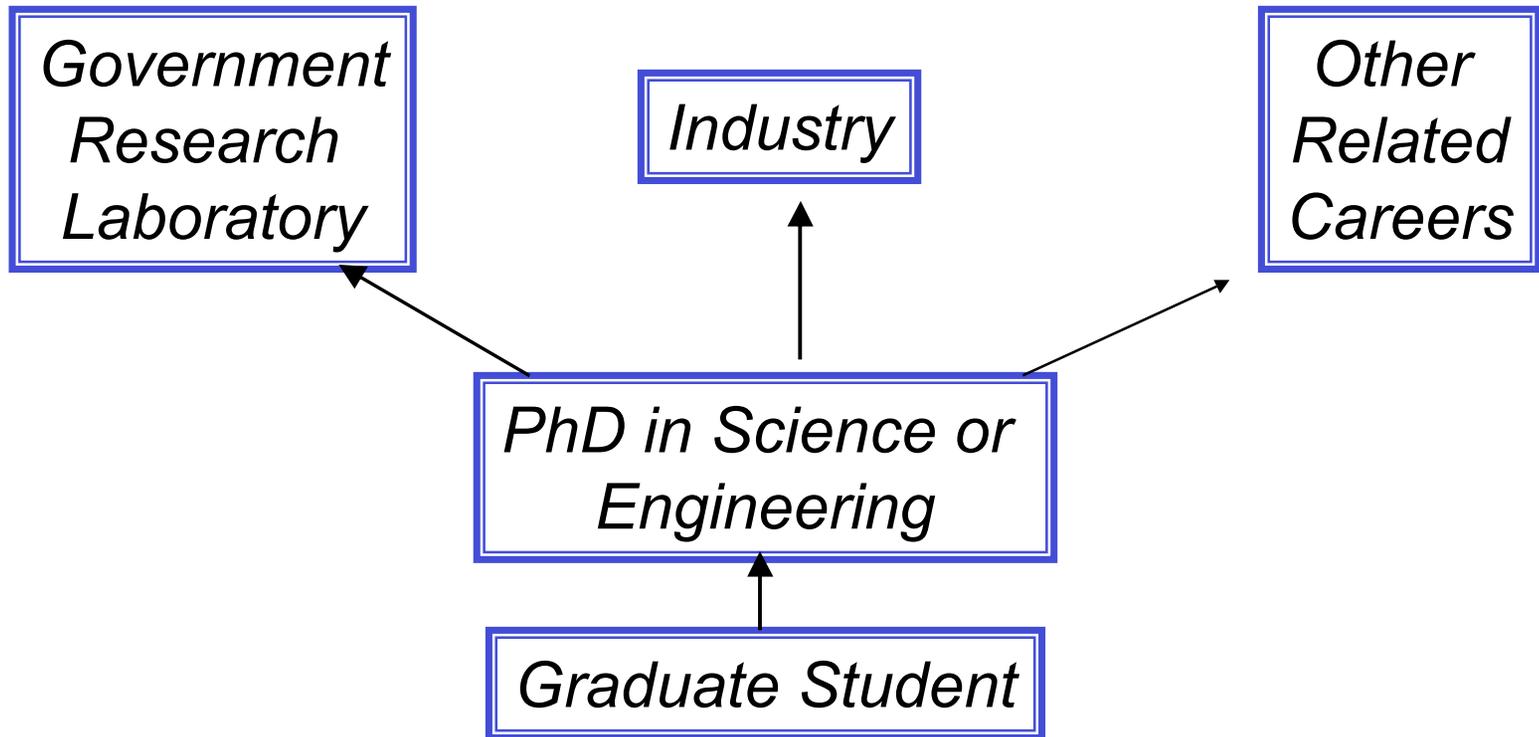
- Number more than doubled between 1967 and 1997
- Increase in number of degrees is *not* accompanied by corresponding increase in employment opportunities -- particularly opportunities as *independent investigator*

Source: NSF

# Some Factors in Changing Climate of Employment

- Growth in federal funding for research is not compensating for increase in PhDs
- Support of research at medical centers is seeing reductions due in part to managed care
- Alternative careers are competitive and some have shrinking job markets

# Non-University Pathways



# Related Careers

- “Traditional” employment for person with PhD in life sciences (as defined by National Academy)

*Academics, Industry, Government*

- Alternative ends (may require second degree)

*Business, Law, Consulting, Public policy,  
Journalism, etc.*

# Non-Linear Paths

## Alternative paths

- Part time
- Time off/re-entry
- Lateral movement from one type of employment to another

# Career Plan

Decide:

- What do you want to accomplish?
- Where do you want to work?
- Do you have major responsibilities outside your career or other special considerations?

# What Do You Want To Accomplish

What do you want to accomplish in

- Research
- Teaching
- Administration
- Service and other professional activities

# Research Considerations

- Research subject areas
  - Basic science
  - Clinical
  - Product based
- Multi-disciplinary studies
- Collaborative investigations
- Availability of continuing research education

# Teaching Considerations

- Course instructor
- Occasional lecturer
- Advisor to students
- Train personnel
- No teaching responsibilities

# Management and Administration

- Working with people/Team member
- Managing work team
- Leadership
  - Running research operation
  - Leading group in industry
  - Administering academic department

# Service to Scientific Community

- Professional societies
- Panels that review proposals
- Journal editorial boards
- Program committees
- Policy committees
- Journal reviews
- Education committees
- Dissemination of scientific information (writing for general audience, giving and attending talks)

# Where Do You Want to Work

- University
- 4-year college
- Hospital-based laboratory
- Research institute
- Industrial research department
- Government research facility
- Alternative career locations

# Other Responsibilities

Do you have focus outside research?

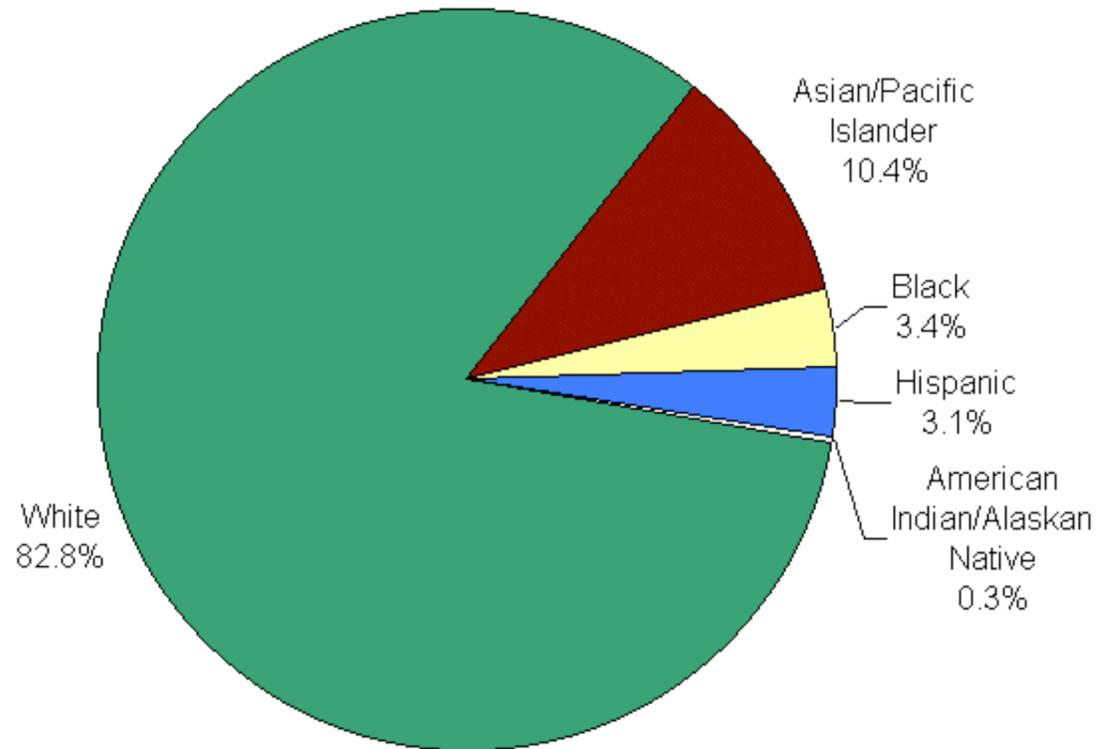
- Academic science versus entrepreneurial ventures
- Research versus clinical duties
- Work versus family/personal commitments

*Must find way to balance*

# Some Special Considerations

- Under-represented minorities
- Persons with disabilities
- Women in science
- Dual careers

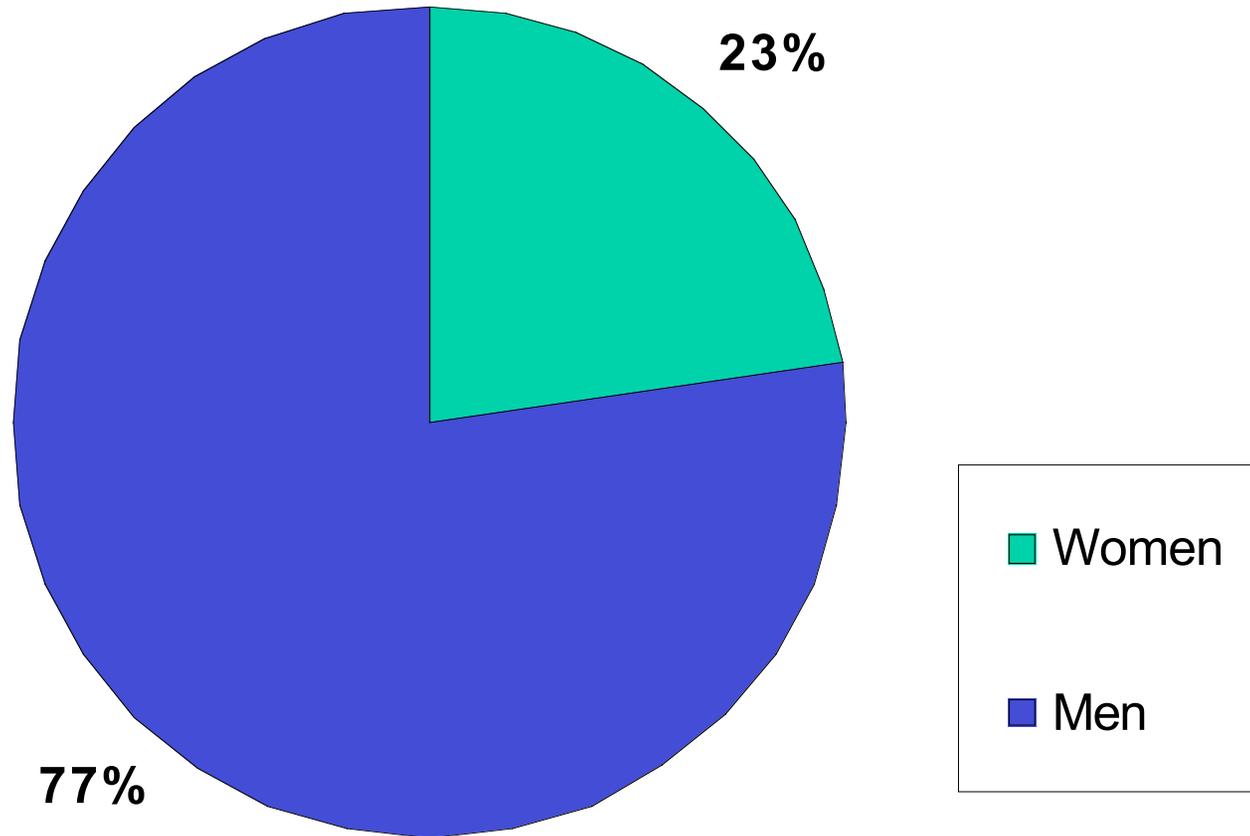
# Scientists and engineers in the U.S. labor force, by race/ethnicity: 1997



**SOURCE:** *Women, Minorities and Persons With Disabilities in Science and Engineering-2000*

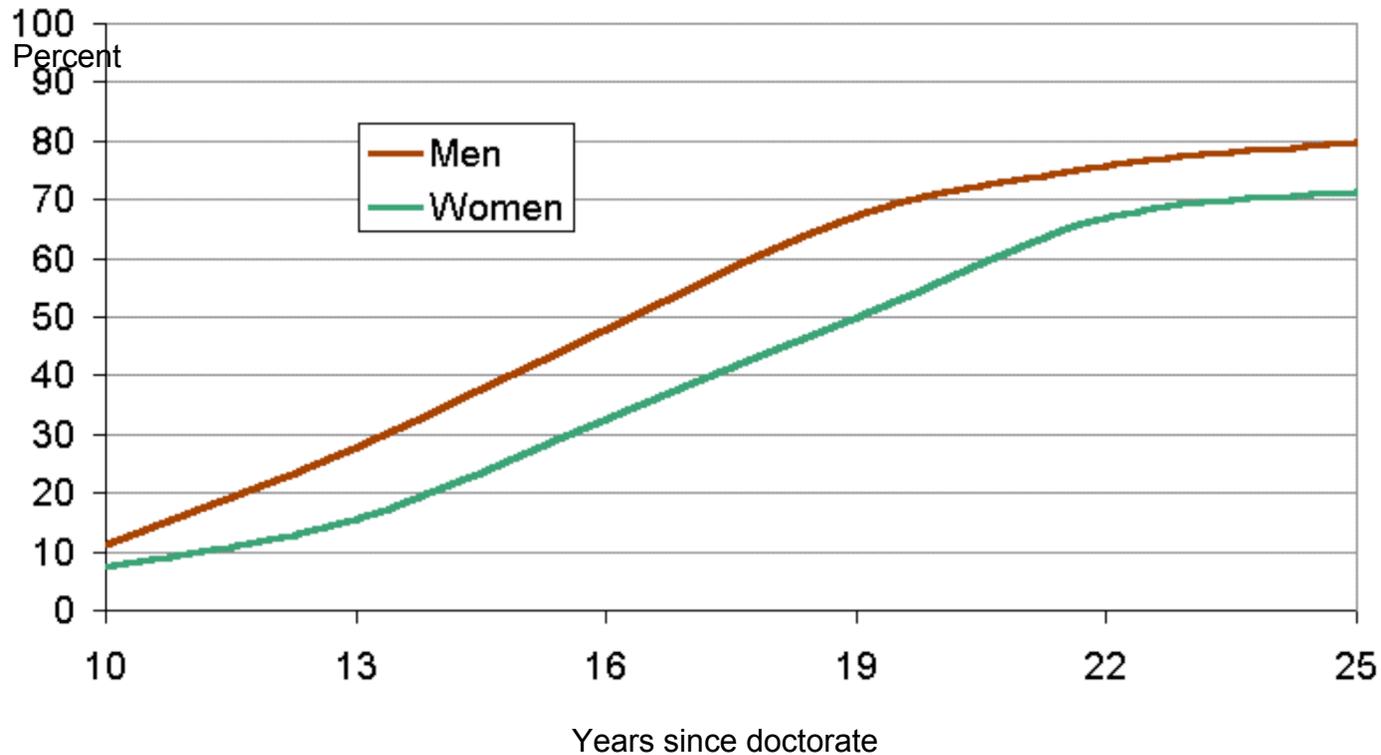


# Scientists & Engineers in Work Place, by Sex:1997



Source: NSF

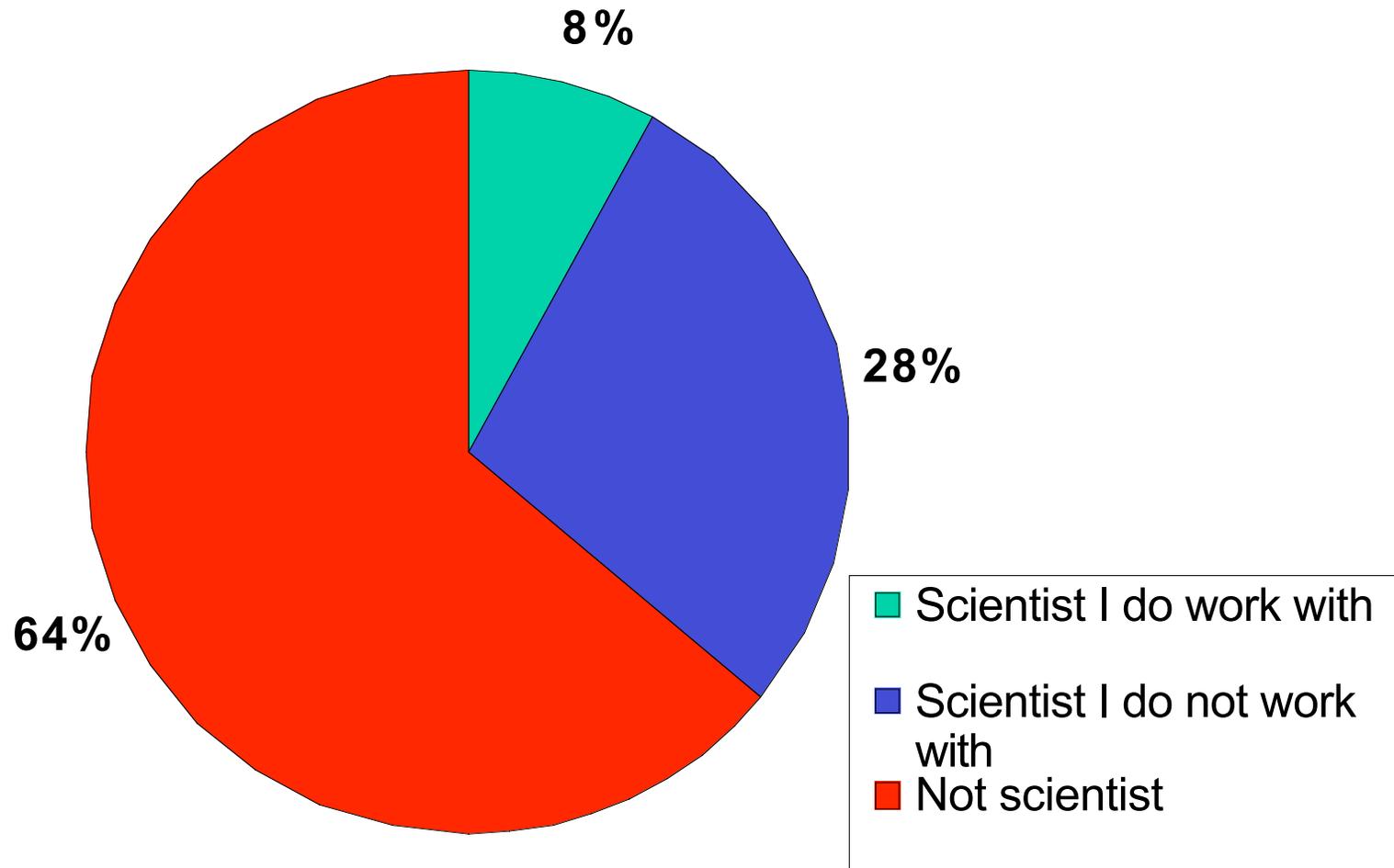
# Percentage of full-time ranked doctoral scientists and engineers in 4-year colleges or universities who are full professors, by sex and years since doctorate: 1997



SOURCE: *Women, Minorities and Persons With Disabilities in Science and Engineering-2000*



# Dual Careers



Survey in *The Scientist*, April 2003

# Summary

- Develop career plan
  - What do you want to accomplish
  - Where do you want to work
  - Be open about considerations & responsibilities
- Find out career information in your field
- Relate your career plan to your plan for graduate education & post-graduate training
- Be ready for roadblocks and detours
- Be open to change

# Resources

- Career Development Center at Science Magazine

<http://nextwave.sciencemag.org/cdc/index.shtml>

- *Careers in Science and Engineering*

<http://www.nap.edu/readingroom/books/careers/>

- National Science Foundation. *Women, Minorities, and Persons With Disabilities in Science and Engineering: 2000* Arlington, VA, 2000 (NSF 00-327)

<http://www.nsf.gov/sbe/srs/nsf00327/start.htm>