

Diversity and Excellence in Physics

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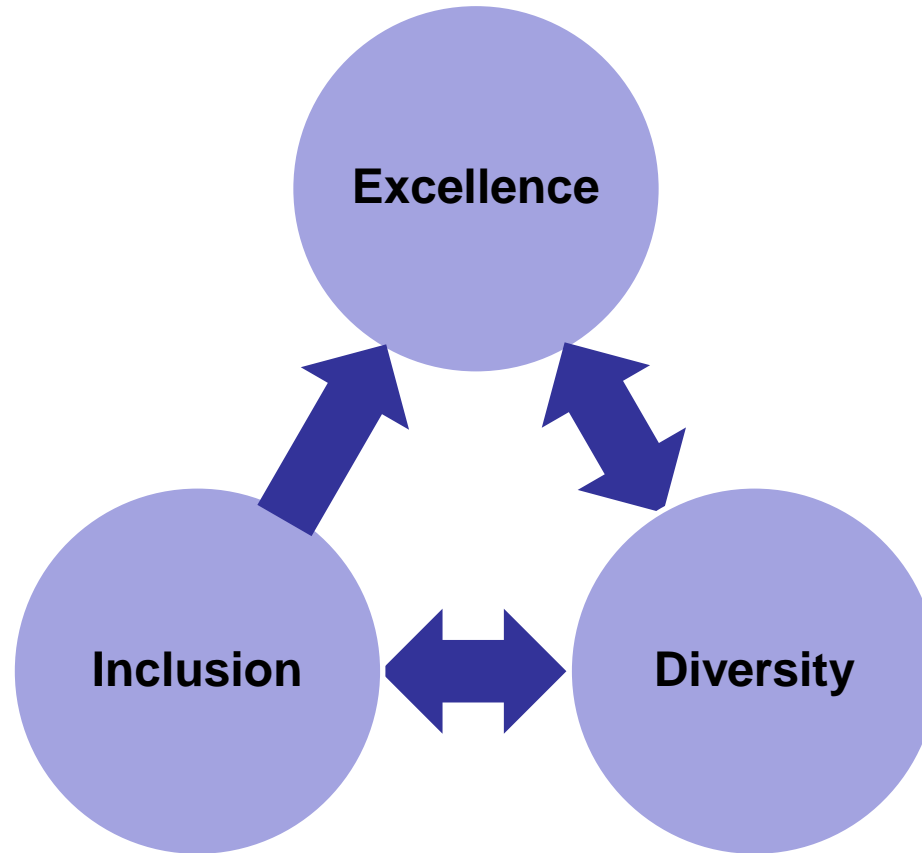
Definitions

Diversity: Having or being composed of differing elements; variety. [Merriam-Webster]

Inclusion: A sense of belonging: feeling respected, valued for who you are; feeling a level of supportive energy and commitment from others so that you can do your best work. [Miller and Katz 2002]

Excellence: The quality of being excellent. [Merriam-Webster]

Turn a vicious cycle into a virtuous one



Why Increase Diversity?

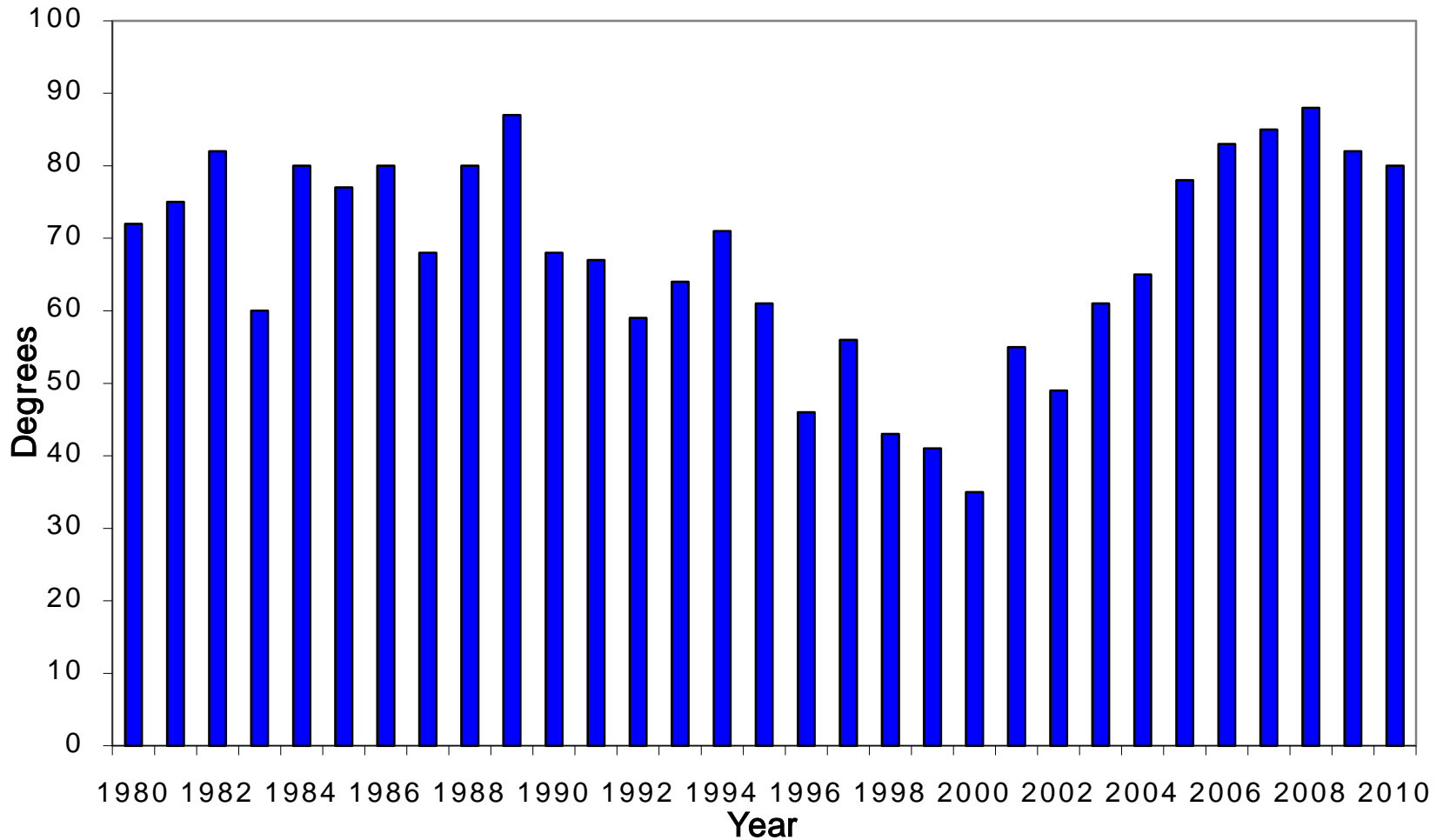


Broadening the talent pool increases the talent



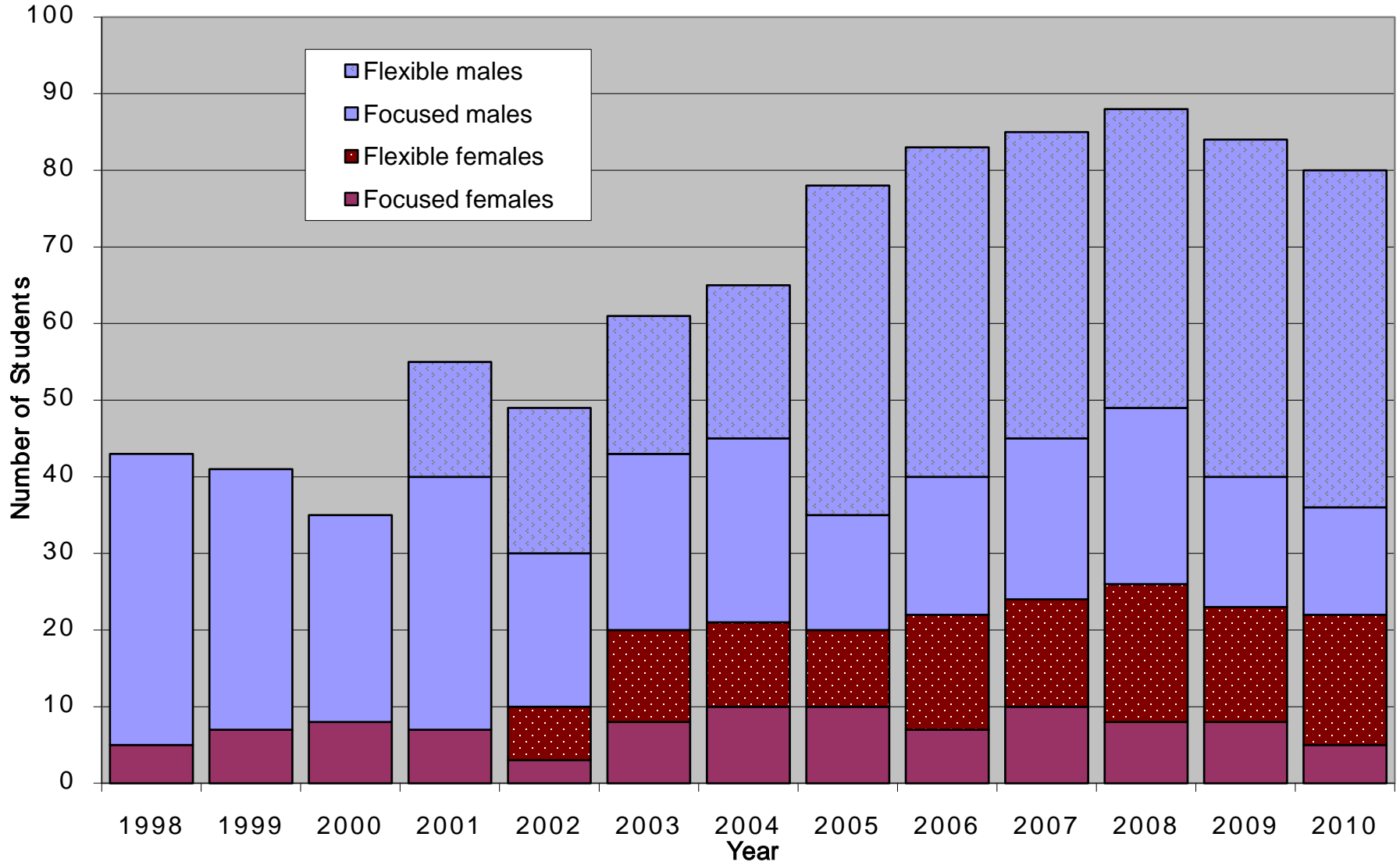
Attracting more students keeps us vital

SB degrees in Physics, 1980-2010

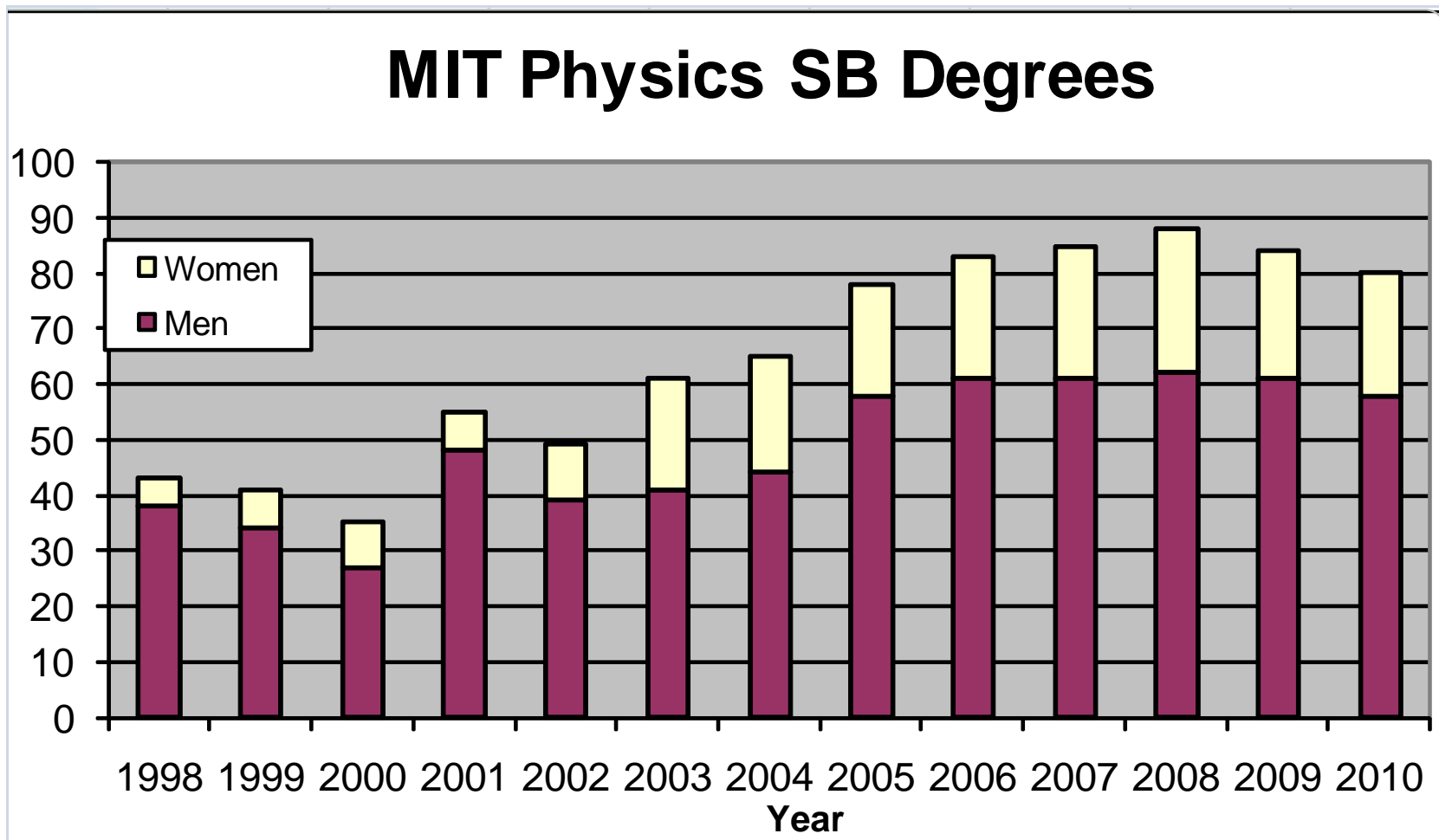


2001: Introduced a flexible degree track

SB Degrees by Gender and Type of Degree



Much of our growth is powered by women



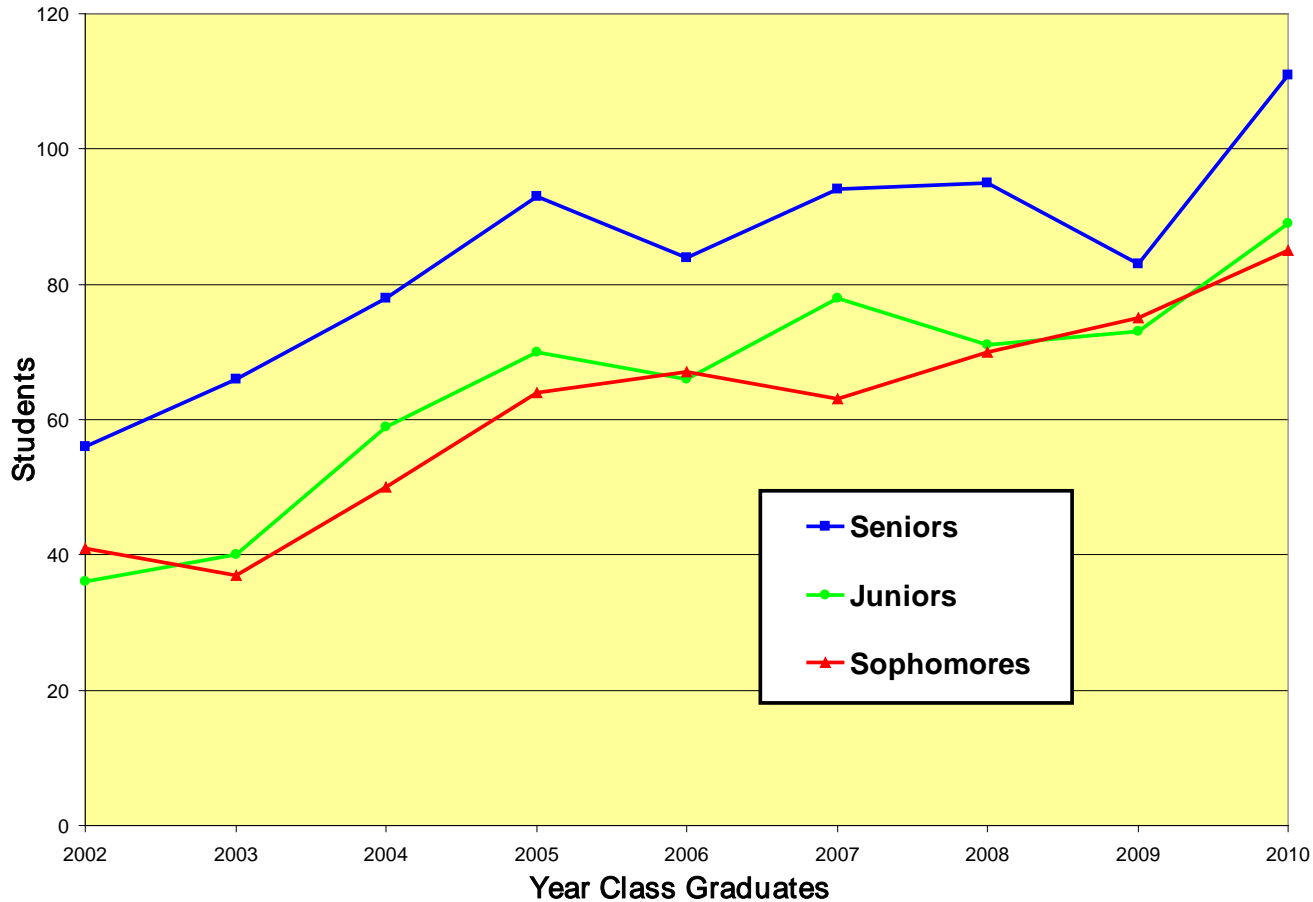
PhD-granting departments averaging 20 or more physics bachelor's degrees per year, classes 2005 through 2007.

| | <u>Annual Average</u> | | <u>Annual Average</u> |
|--------------------------------|---------------------------|--------------------------------|---------------------------|
| Mass. Inst. of Technology | 82 | Carnegie Mellon U (PA) | 31 |
| U of California, Berkeley | 75 | Cornell U-Applied (NY) | 30 |
| U of Washington | 66 | Purdue U, West Lafayette (PA) | 30 |
| Brigham Young U (UT) | 55 | Rensselaer Polytech Inst. (NY) | 30 |
| Colorado School of Mines | 51 | U of MN, Minneapolis | 30 |
| U of IL, Urbana/Champaign | 49 | U of California, Davis-Applied | 29 |
| U of California, Los Angeles | 47 | U of Florida | 29 |
| U of Maryland, College Park | 42 | U of California, Davis | 28 |
| U of California, San Diego | 40 | U of California, Santa Barbara | 28 |
| U of Colorado, Boulder | 39 | U of California, Santa Cruz | 28 |
| Ohio State U | 37 | Michigan State U | 27 |
| U of Michigan, Ann Arbor | 37 | Stanford U (CA) | 27 |
| U of Virginia | 37 | Yale U (CT) | 26 |
| U of Arizona | 36 | Princeton U (NJ) | 24 |
| Rutgers U, New Brunswick (NJ) | 35 | Columbia U (NY) | 23 |
| Cornell U (NY) | 34 | U of California, Irvine | 23 |
| Pennsylvania State U | 34 | Boston U (MA) | 21 |
| U of Texas, Austin | 34 | College of William & Mary (VA) | 21 |
| U of Wisconsin, Madison | 34 | Florida State U | 21 |
| California Inst. of Technology | 33 | U of MA, Amherst | 21 |
| U of Chicago (IL) | 33 | U of Rochester (NY) | 20 |
| U of Utah | 33 | | |

Note: List includes only those departments who contributed degree data for all 3 years.

Top producers
of physics
bachelor's
degrees (AIP)

Fall physics undergrad enrollments, 2002 – present



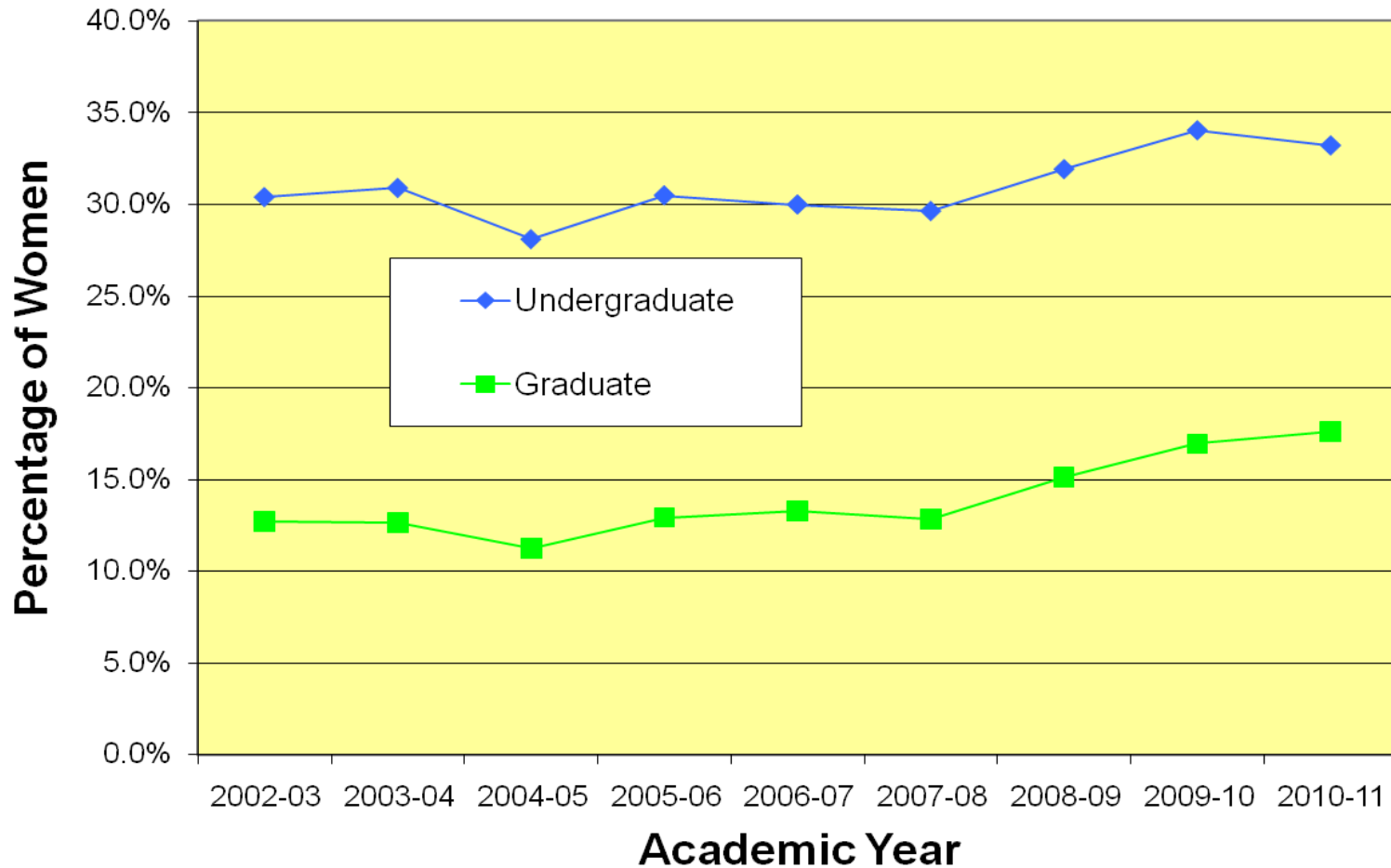
current year

| | M | F |
|------|----|----|
| sr | 67 | 44 |
| jr | 58 | 31 |
| soph | 65 | 20 |

MIT now has more physics majors than biology majors.

Enrollment by Gender 2003 – 2010

Undergraduate and Graduate

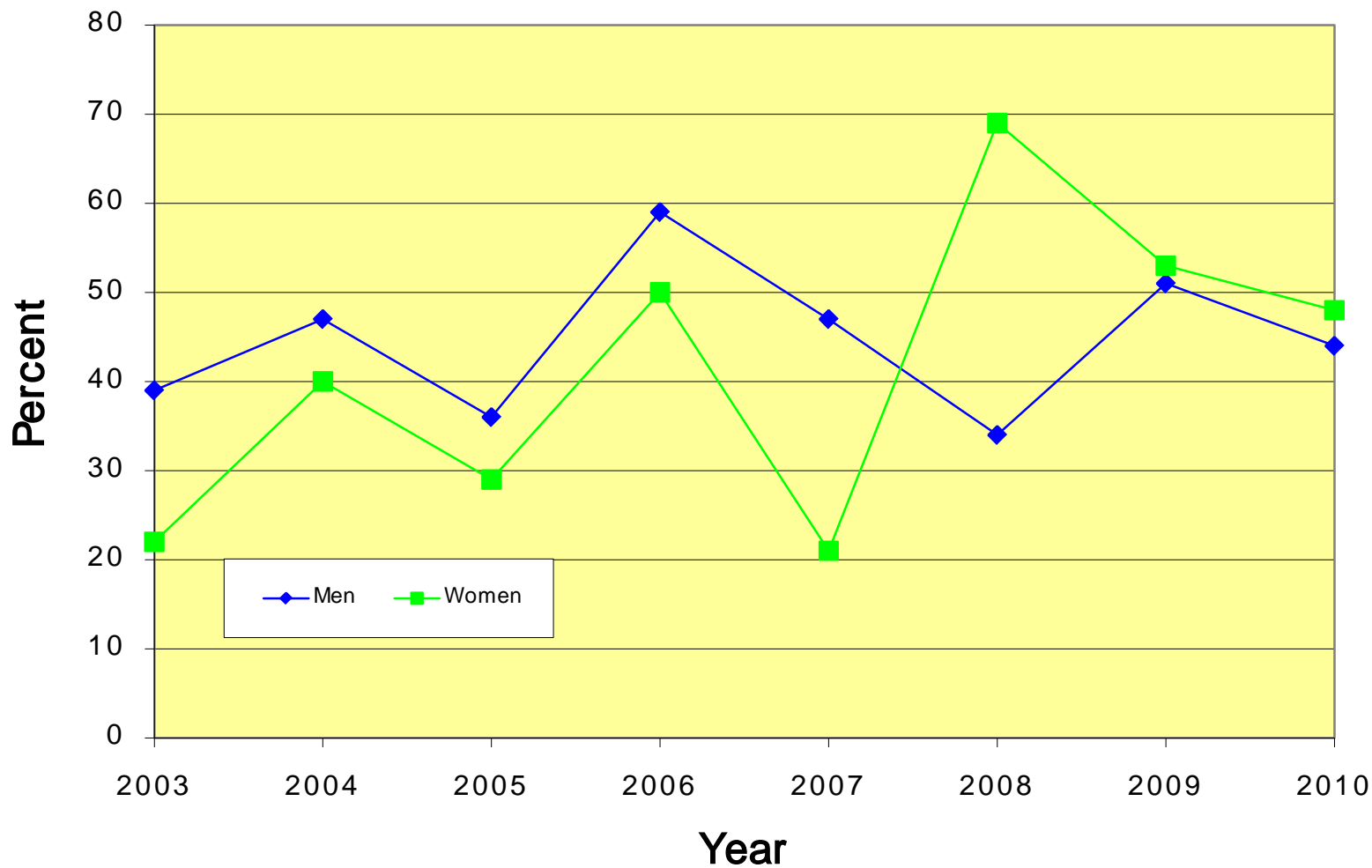


Competition for graduate students (2007 compilation by MIT students)

| School | Percent women graduate students |
|------------|---------------------------------|
| Princeton | 12.4 |
| MIT | 13.7 |
| UIUC | 13.7 |
| U. Chicago | 15.8 |
| UCSB | 16.4 |
| Cornell | 16.8 |
| Stanford | 18.2 |
| Caltech | 22.8 |
| Columbia | 35.8 |
| Harvard | 37.3 |

Graduate Admissions 2003 – 2010

Yield by Gender



Increasing our diversity increases our contribution to the society that funds us



Shirley Jackson
PhD 1973

Ronald McNair
PhD 1976

Cherry Murray
PhD 1978

Elements of a Diversity Initiative

| | |
|-------------------|-------------|
| Undergraduates | Recruitment |
| Graduate students | Retention |
| Postdocs | Mentoring |
| Faculty | Promotion |
| Staff | Climate |

How to increase diversity in physics?

Recruit more URM and female graduate students

Recruit and retain a more diverse faculty

Search process and mentoring

Improve the climate and community

Share the value and excitement of physics

MIT Physics Strategy

Increase the number of physics students in MSRP (9 in 2010)
(summer research, URM undergrads)

Physics Dept. is aggressively recruiting & promoting

Develop other relationships with URM undergraduates and
Masters students

Fisk students (Figueroa), local students (UMass Boston)

Recruit at NSBP/NSHP and SACNAS conferences

Develop relationships with minority-serving institutions

*Howard U, Southern U, UPR, Fisk, FAMU, FIU, UTEP,
Morehouse, Spelman, ...*

APS Minority Bridge Program



MINORITY BRIDGE PROGRAM

AMERICAN PHYSICAL SOCIETY

INCREASING THE
NUMBER OF MINORITIES
EARNING PHDS IN PHYSICS

www.aps.org/mbp

- APS staff visited 10-15 URM schools producing many physics bachelors degrees
- Met with students and faculty
- Recruit ~6 top research universities to bring their resources to this problem (faculty and administration) ← MIT, Harvard, Stanford, ...
- Understand existing bridge programs (e.g., Fisk-Vanderbilt)
- Gather data on why physics minority undergrads choose not to pursue PhDs
- June 2010 gathering of these groups
- Proposal in Fall 2010 to bootstrap programs at research universities

Our undergraduates help recruiting graduate women!

Northeast Conference for Undergraduate Women in Physics

Northeast
Conference for
Undergraduate
Women in Physics

January 15-16, 2011
at MIT

About the Conference

The Northeast Conference for Undergraduate Women in Physics (NCUWP) is a three-day conference for undergraduate physics majors in the northeastern United States. It will be held on January 15-16, 2011 simultaneously with conferences at the University of Southern California (USC), Purdue University, and the North Carolina Research Triangle (NCRT).

NCUWP's goal is to help young women continue in physics by providing them with the opportunity to experience a professional conference, information about graduate school and professions in physics, and access to other women in physics of all ages with whom they can share experiences, advice, and ideas. Our program includes research talks by faculty, panel discussions about graduate school and careers in physics, presentations and discussions about women in physics, laboratory tours, student research talks, a student poster session, and several meals during which presenters and students interact with each other.



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Faculty Search Process

“Open search” in any subfield of physics or astronomy

Search Committees – before application deadline – must:

- Meet with Department Head to review implicit bias, search process, etc.
- Assemble lists of potential Women candidates, Minority candidates, and Stars, and encourage applications from appropriate individuals

Be a search committee, not a sort committee.

Making “search” a verb

Pre-search visits:

Department provides up to \$1000 for visits by promising women and underrepresented minorities before they are ready to apply.

FY09: 5 including one URM

FY10: 3, no URM

Mentoring

Junior faculty have three mentors (Senior faculty, Division Head, Department Head)

Thorough annual review for all junior faculty

All faculty now asked to report on mentoring activities in annual salary review

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APS/CSWP Site Visit Program



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Site Visits

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Improving the Climate for Women

The APS has had a long-standing interest in improving the climate in physics departments for underrepresented minorities and women. Toward that goal, the Committee on Minorities (COM) and the Committee on the Status of Women in Physics (CSWP) both sponsor site visit programs. In recent years, the visits have been expanded to include national labs as well as universities. The aims of these visits are three-fold:

1. Identify a set of generic problems commonly experienced by minority and/or women physicists.
2. Intervene to solve many of these generic problems.
3. Address problems arising in the particular physics department or lab visited and help improve the climate for minorities or women (both students and faculty) in the facility.

Site visits are conducted at the request of a department chair or lab director. Members of the site visit team meet with the physics department chair/lab director, groups of physics faculty members, minority or women

Climate and Community

MIT Physics Diversity Summit 2010
January 25, 2010
MIT Green Center, Cosman Room 6C-442

Monthly
Physics
Diversity
Lunches

Annual
Physics
Diversity
Summit



**URM physics conferences with
students, staff and faculty**

Join us in celebrating and advancing the cause of
underrepresented minority physics students, postdocs, staff and faculty!

Campus
Advocacy:
Committee
on Race
and
Diversity

Office of
Minority
Education

Program

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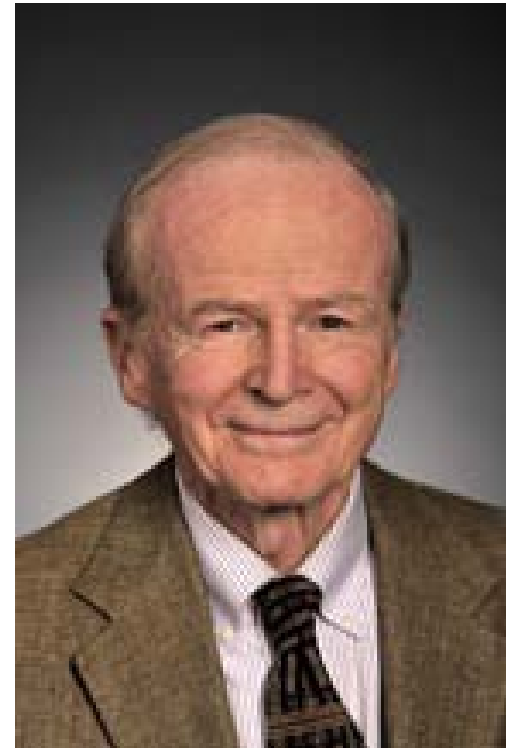
Share the excitement and value of physics

Marketing to students

Physics teaches you how to analyze and solve problems of all kinds

“I prefer to hire physics majors”

- Institute Professor John Little
Sloan School of Management
MIT Physics SB and PhD



A physics degree can help you address global problems



Virginia Corless

MIT SB Physics 2005

Cambridge PhD Astrophysics 2009

US Congressional Fellow

Senate Energy & Natural Resources
Committee

Pursuing a career in energy policy

More than 100 non-physics MIT faculty (11%) have physics degrees



Eric Grimson
EECS



Anette Hosoi
MechE



Heather Lechtman
Archaeology



Tomaso Poggio
Brain Science



Mitchel Resnick
Media Lab

Vision



Make MIT the top-ranked university in science and the best place to work and study for everyone.



The MIT Physics Department is committed to increasing the diversity of its faculty and student populations to improve our excellence and to better serve the society that supports our work.