APS Education and Diversity Programs

Monica Plisch, Director of Education and Diversity
• Conferences for Undergraduate Women in Physics (CUWiP)
• New Faculty Workshop
• Physics Chairs Meeting
• REU Site Leaders Conference
• Professional Skills Workshops
• Graduate Education Conference

• LGBT Climate in Physics report
• Mentoring seminar curriculum
• Ethics case studies
• Joint Task Force on Undergraduate Physics Programs report
• Physics education posters
• More...
Resources for Units

- Sessions/talks
  - Education topics
  - Diversity topics
- Workshops
  - Effective mentoring practices
  - Professional skills for women
- Honors
  - Inclusive practices for fellows, prizes, awards
- Meetings
  - Childcare grants
  - APS code of conduct
- Unit diversity statistics
- Unit committee on education / diversity
High school classes taught by teacher with degree in the field

[Bar chart showing the percentage of high school classes taught by teachers with degrees in various subjects.]

Source: Schools and Staffing Survey
Numbers of new physics teachers educated

1081 Institutions (72%)

Number of Physics Majors Certified in 3-Year Period

Source: Title II
Physics Teacher Education Coalition (PhysTEC)
PhysTEC Outcomes

Key Components

- Recruiting
- Course reform
- Early teaching experiences
- Mentoring and induction
- Learning Assistants
- Teacher in Residence
- Champion
- Collaboration
- Institutional commitment
- Assessment

- 46 PhysTEC Sites educate 1 in 8 physics teachers with a degree
- Comprehensive Sites nearly tripled their numbers of physics teachers
- Retention rates for new PhysTEC teachers are over 70% after 5 years
Recruiting physics teachers

“Physics teacher candidates are in your program: They just need the opportunity to discover how rewarding teaching can be.”

– Alma Robinson, Virginia Tech

“I’ve been generally surprised how many physics students were interested once they knew that teaching is an option.”

– Brian Thoms, Georgia State
Participation of Women in Physics

Physics Degrees Earned by Women

Bachelor's
PhD

Source: IPEDS and APS
APS Conferences for Undergraduate Women in Physics

2018 CUWIP Conference Site Locations

If you have any questions, please email women@aps.org

1. University of Oregon
   - California (San Jose and north)
   - Idaho
   - Montana
   - Oregon
   - Washington
   - Wyoming

2. Iowa State
   - Illinois
   - Iowa
   - Minnesota
   - North Dakota
   - South Dakota
   - Wisconsin

3. University of Toledo
   - Indiana
   - Michigan
   - Ohio
   - Pennsylvania (Pittsburgh and west)

4. Rochester Institute of Technology
   - Maine
   - Massachusetts (West of I-91)
   - New Hampshire
   - New York (Northern of Poughkeepsie)
   - Pennsylvania (Central-Harrisonburg)
   - Vermont

5. Cal Poly Pomona/ Pomona College/ Harvey Mudd College
   - Cal Poly Pomona
   - Pomona College
   - Harvey Mudd College
   - Alaska
   - California (South of San Jose)
   - Hawaii

6. Arizona State University
   - Arizona
   - Colorado
   - Nevada
   - New Mexico
   - Utah

7. University of Kansas
   - Arkansas
   - Kansas
   - Missouri
   - Nebraska
   - Oklahoma
   - Texas

8. University of North Florida
   - Alabama
   - Florida
   - Georgia
   - Louisiana
   - Mississippi
   - Puerto Rico
   - South Carolina

9. University of Virginia
   - Kentucky (Frederick and west)
   - North Carolina
   - Tennessee
   - Virginia (Fredericksburg and south)
   - West Virginia

10. George Washington University
    - District of Columbia
    - Maryland (East of Frederick)
    - New Jersey (Trenton and south)
    - Pennsylvania (Eastern, Lancaster)
    - Virginia (North of Fredericksburg)

11. Columbia/Barnard/ City College
    - Connecticut
    - Massachusetts (East of I-91, including Springfield)
    - New Jersey (North of Trenton)
    - New York (Poughkeepsie and south)
    - Rhode Island

12. Queens University in Canada
    - Site location includes all Canadian provinces
CUWiP Participation

Female Physics Degrees

CUWiP Attendance

(est.)
Participation of Underrepresented Minorities (URM) in Physics

Source: US Census, IPEDS, AIP, and APS
APS Bridge Program: Key Features

- **Recruit** students not accepted to graduate programs
- **Place students in Bridge Programs** (6):
  - Coursework, research, mentoring, induction, progress monitoring
  - For students who demonstrate potential but underprepared
- **Place students at Partnership Institutions** (29):
  - “COM approved” programs
  - Students directly admitted to doctoral program
- **Monitor** student/site progress
- **Research**
- **Disseminate / Advocate**
APS Bridge Program Achievement

National Achievement Gap

- **Left Program**
- **Placed/Retained**
- **Project Funding**

Students

<table>
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<tr>
<th>Year</th>
<th>Left Program</th>
<th>Placed/Retained</th>
<th>Project Funding</th>
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African American Bachelor Degrees

Bachelor's Degrees Earned by African Americans

- Biology
- Chemistry
- Math & Stats
- Engineering
- Physics
- Earth Sciences

US College-Age Black Population

Source: IPEDS, US Census, APS
Hispanic American Bachelor Degrees

Bachelor's Degrees Earned by Hispanic Americans

Source: IPEDS, US Census, APS
National Mentoring Community (NMC)

Mission: To increase the number of underrepresented ethnic and racial minorities who complete a physics BS degree

Program components:
- Pair undergraduates with local faculty mentors
- Annual conference
- Email prompts
- Workshops/PD
- BEAM fund

Sign up now!
- [www.aps.org/nmc](http://www.aps.org/nmc)
- Email: NMC@aps.org
Biggest concerns with finishing physics degree

- My ability to be a physicist: 21%
- Getting into graduate school: 20%
- Completing courses/GPA: 16%
- Job opportunities: 14%
- Finances: 13%
- Finding research/area of interest: 5%
- Finding support/Combating isolation: 4%
- Nothing: 7%
NMC Outcomes

• All mentees reported the program was useful, and it helped them gain confidence, knowledge, and opportunities.

• One-third of mentees reported the mentoring significantly increased their intent to complete a BS degree in physics.

• Mentees’ intent to go to graduate school increased significantly due to the program.
• “[The NMC] opened my chances for opportunities I thought I would never have. I mean that with the deepest sincerities.”

• “[The NMC] connected me to other physicists and afforded me visibility of our diversity. Physicists get typecast into a certain demeanor, look, and nature, but NMC brought together various physicists of all types. It bolstered the self-confidence that I had knowing that we are unified by the pursuit of answers, but otherwise diverse.”
Physics GRE: Impact of Cutoff Scores

- Fraction (White)
- Fraction (Hispanic)
- Fraction (Black)
- Fraction (Asian)

- 0.09 (Black)
- 0.34 (Hispanic)
- 0.44 (White)
- 0.61 (Asian)

Scores:
- 650