APS Initiatives for Broadening Participation

Theodore Hodapp
Director of Education and Diversity
American Physical Society
Physics / STEM Bachelor Degrees

Source: IPEDS Completion Survey
Percentage of Women in Physics

![Graph showing the percentage of women in physics from 1965 to 2010. The graph includes data for Bachelor, Doctorate, and PostDoctorate degrees. The Δ = 12 Years label indicates a significant gap between the Doctorate and Bachelor degrees. The source of the data is IPEDS, AIP SRC.](source.png)
Female Fraction of Bachelor Degrees

- **All STEM**
- **Biological Sciences**
- **Physics**

Source: IPEDS
African American Undergraduate Majors

US College-Age African American Population

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

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<th>Year</th>
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<th>Engineering</th>
<th>Math &amp; Stats</th>
<th>Physics</th>
<th>Earth Sciences</th>
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Hispanic Undergraduate Majors

US College-Age Hispanic Population

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

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9-10% of BS degrees in physics are granted to underrepresented minorities.

52 PhDs awarded to minorities in 2010.

Sources: IPEDS Completion survey by race, US Census
Minority Scholarships

- Began in 1980
- African American, Hispanic American, Native American
- Typically 1st and 2nd year, but available to juniors
- $2,000 (year 1), $3,000 (year 2), $500 (department)
- Mentoring by COM and local faculty member
- 481 scholarships: 62% male, 38% female
- African American 42%; Hispanic 51%; Native American 7%
- 51% of recipients received BS in physics
- 75 PhDs, 36 in Physics/Astronomy
08.2 JOINT DIVERSITY STATEMENT
(Adopted by APS, NSBP, NSHP in 2008)

To ensure a productive future for science and technology in the United States, we must make physics more inclusive. The health of physics requires talent from the broadest demographic pool. Underrepresented groups constitute a largely untapped intellectual resource and a growing segment of the U.S. population.

Therefore, we charge our membership with increasing the numbers of underrepresented minorities in physics in the pipeline and in all professional ranks, with becoming aware of barriers to implementing this change, and with taking an active role in organizational and institutional efforts to bring about such change. We call upon legislators, administrators, and managers at all levels to enact policies and promote budgets that will foster greater diversity in physics. We call upon employers to pursue recruitment, retention and promotion of underrepresented minority physicists at all ranks and to create a work environment that encourages inclusion. We call upon the physics community as a whole to work collectively to bring greater diversity wherever physicists are educated or employed.
APS Bridge Program: Project Goals

- Increase, within a decade, the number of physics PhDs awarded to underrepresented minority students to match the fraction of physics Bachelor’s degrees granted to these groups.
- Develop, evaluate, and document sustainable model bridging experiences that improve the access to and culture of graduate education for all students, with emphasis on those underrepresented in doctoral programs in physics.
- Promote and disseminate successful program components to the physics community.
Key Personnel

Steering Committee
• J.D. Garcia (Arizona)
• Yolanda George (AAAS)
• Wendell Hill (UMCP)
• Anthony Johnson (UMBC)
• Ramon Lopez (UT Arlington)
• Steve McGuire (Southern)
• Cherry Murray, chair (Harvard, APS President 2009)
• Luz Martinez-Miranda (President, NSHP)
• Paul Gueye (President, NSBP)
• Bernadette Cogswell (Vanderbilt Grad Student)
• Ximena Fernández (Columbia Grad Student)

Architect’s Council
• Keivan Stassun (Fisk/Vanderbilt)
• Cagliyan Kurdak (Michigan)
• Marcel Agüeros (Columbia)
• Ed Bertschinger (MIT)

APS Staff
• Theodore Hodapp
• Brian Beckford (Project Manager)
• Arlene Modeste Knowles
• Bushraa Khatib (Project Coordinator)
• Monica Plisch
APS Bridge Program: Key Components

- Recruiting through graduate programs across the US (now 100+ institutions, representing 70% of all doctoral students)
- Spend 1-2 years in a “Bridging program”
  - Take advanced UG or entry-level graduate coursework
  - Graduate-level research
  - Demonstrate ability to do independent research and succeed in graduate-level coursework
  - Receive coaching on preparing graduate admissions package (letters, GRE, statements)
  - Accepted into doctoral program
- Receive mentoring in doctoral program (especially in first years)
- Research into barriers; disseminate successful program elements
- Build a national coalition of departments committed to improving participation
Existing Bridge Programs in Physics

- Fisk / Vanderbilt
- Columbia University
- University of Michigan
- MIT (recently started)
Bridge Sites

• Recruitment (APS, and institution)
• Admission decisions (how, what criteria)
• Financial support (how much, and timescale)
• Multiple Mentoring (who, how interactions work)
• Community (induction, socialization)
• Coursework (advising, physics and other courses)
• Research (appropriate matching)
• Progress monitoring (coursework, tutors if needed, research “fit”)
• Application coaching (GRE, statements, schools)
Student Eligibility

- Bachelor’s degree in physics or closely related discipline
- US citizen or permanent resident
- Either:
  - Did not apply to graduate program this year
  - Applied but was not accepted
- Be committed to improving diversity in physics
- Meet individual requirements of the institution

Students may not be currently enrolled or have an existing physics graduate degree
Getting Involved

• **Member Institution** (any institution)
  Free; receive information / updates; reduced fees for APS-BP conferences

• **Partnership Site** (Doctoral granting institutions)
  APS COM approval process; recommended site for Bridge Fellows (and others) to attend; demonstrate effective practices in graduate student support

• **Bridge Site** (MS or PhD granting)
  Receive significant funding from APS; build sustainable program; prepare 2+ students each year for graduate study; significant institutional commitment

www.APSBridgeProgram.org
Conferences/Workshops

• Department Chairs (30-31 May 2013; ACP)
• Distance Education / Online Learning (1-2 June 2013; ACP)
• New Faculty Workshop (17-20 June 2013; College Park)
• APS Bridge Program (27-29 June 2013; ACP)
• New Faculty Workshop (7-10 November 2013; ACP)
• “Experienced” Faculty Workshop (Spring, 2014; ACP)
• PhysTEC (19-20 May 2014; Austin, TX)

Diversity Reception: Tonight, Peale A 7-8:30p
Project Progress

• Bridge Site Selection
  • 24 Applicants
  • 7 Selected for full Proposals
  • 2 Sites will be awarded (end of April)

• Student Recruitment
  • 47 current applicants

• Summer Meeting

• Admissions Study
27 – 29 June, American Center for Physics

- Bridge students, current a prospective bridge sites, interested faculty, researchers, NSF program officers
- Jim Duderstadt (former president of the University of Michigan)
- Logistics of running project components
- Larger issues surrounding minority participation in physics (admissions, GRE, mentoring, Implicit Bias, Stereotype Threat, etc.)
- Registration: apsbridgeprogram.org/conferences/
Admissions Bias?

Source: PhD Recipients from Oregon State University
GRE Quantitative Scores

Source: ETS, "Factors that can influence performance on the GRE General Test 2006-2007"

GRE Quantitative scores for US Citizens

www.aps.org