APS Bridge Program: Enhancing Diversity in Physics Graduate Education

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Joint Diversity Statement

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.
African American Undergraduate Majors

US College-Age African American Population

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

1995 2000 2005 2010

172 149
Hispanic Undergraduate Majors

US College-Age Hispanic Population

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

1995 2000 2005 2010

0% 5% 10% 15% 20%

105 273
Physics Degrees Awarded to URM in the US

Bachelor's Degrees (2002-04): ~375 degrees

Doctoral Degrees (2008-10): ~40 degrees, ~30 more PhDs

Source: IPEDS, US Census
URM Physics PhDs Normalized to US Minority Population

100% would indicate full participation by minorities

52 PhDs awarded to URMs in 2010

Sources: IPEDS Completion survey by race, US Census
Cumulative PhD Completion Rate for Math/Physical Sciences

Source: Council on Graduate Schools
APS Bridge Program Goals

• Increase, within a decade, the fraction of physics PhDs awarded to URM 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
Steering Committee

- J.D. Garcia (University of Arizona)
- Yolanda George (AAAS)
- Wendell Hill (University of Maryland, College Park)
- Anthony Johnson (University of Maryland, Baltimore County)
- Ramon Lopez (UT Arlington)
- Steve McGuire (Southern University)
- Cherry Murray, chair (Harvard, APS President 2009)
- Luz Martinez-Miranda (President, NSHP)
- Bernadette Cogswell (Vanderbilt Graduate Student)
- Ximena Fernández (Columbia Graduate Student – Invited)

APS Staff

- Theodore Hodapp
- Peter Muhoro (Project Manager)
- Arlene Modeste Knowles
- Bushraa Khatib (Project Coordinator)
• Establish a set of Bridge Programs
• Recruit and support students
• Provide professional development at all stages
• Develop a network of Partnership Institutions
• Study impact on students and departments
• Spread ideas throughout the community
Bridge Program Types

Masters degree as a “transition” to PhD
• Take advanced UG and entry-level graduate coursework
• Do research with doctoral faculty
• Demonstrate ability to do independent research and succeed in graduate-level coursework
• Become “known” to graduate faculty
• Receive graduate-assistantship

Post-baccalaureate year
• Similar attributes to Masters program, but not admitted
• Begin research in summer

Establish ~10 over next 5-10 years; ~2 students/yr/BP site
Recruit and Support Students

• Common student application
• Recruit through
  • Graduate programs
  • MSI relationships and visits
  • Conferences
  • Direct web applications
• Support students with:
  • Direct advice
  • Mentoring relationships
  • Fellowship support to attend Bridge
  • Summer professional development workshops
Professional Development

• Summer workshop for students and faculty

• Students
  • Study skills
  • Taking GRE (general and physics)
  • Navigating graduate school
  • Applying for graduate school

• Faculty
  • Understanding challenges faced by students
  • Mentoring
Network of Partnership Institutions

- Identify local champion
- Demonstrate willingness to:
  - Provide mentors to Bridge students
  - Participate in monitoring and tracking student progress
  - Address climate for supporting URM students
  - Establish research collaborations with MSIs
Research Questions

**Student Impact**

- Do Bridge Students improve their chances of being accepted into graduate school?
- Are Bridge Students successful in graduate school?

**Department Impact**

- How do graduate admissions processes work across the US?
- Are there common themes in induction and support at institutions that are more successful at graduating URM PhDs?
Dissemination

• Annual workshop for Bridge students / faculty
• Research results
• Promoting good-practices of new and existing Bridge Sites and Partnership Institutions
• Raising awareness of issues and of evidence-based interventions that improve diversity in physics
Support

• Existing Bridge Programs
  • Columbia University
  • Fisk-Vanderbilt University
  • Massachusetts Institute of Technology
  • University of Michigan

• Doctoral Granting Institutions
  • Florida A & M University (MSI)
  • Florida International University (MSI)
  • Harvard University
  • New Mexico State University (MSI)
  • Stanford University
  • University of Arizona (MSI)
  • University of California, Berkeley
  • University of California, Davis
  • University of Colorado
  • University of Texas, Austin
  • University of Texas, San Antonio (MSI)

• Minority Serving Institutions
  • California State University, Long Beach
  • Chicago State University
  • Dillard University
  • Morehouse College
  • Southern University
  • Spelman College
  • Texas State University
  • University of Puerto Rico, Humacao
  • University of Puerto Rico, Mayaguez
  • University of Puerto Rico, Rio Piedras
  • University of Texas, El Paso
  • Xavier University of Louisiana

• Foundations and Societies
  • Florida Education Fund
  • National Society of Black Physicists (NSBP)
  • National Society of Hispanic Physicists (NSHP)
  • Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)