Minority PhDs in Physics: 20% Representation and a Plan to Address This

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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.
Minorities in Higher Education

- College Age Population: ~1.5M
- All Bachelor Degrees: ~200k
- Physics Bachelor Degrees: ~450
- Physics Doctoral Degrees: ~35
- Physics Faculty: ~12
Minorities in Physics Education

- Bachelor Degree: ~450
- Doctoral Degree: ~35
- Faculty: ~12
URM Physics PhDs
Normalized to Minority Population

100% would indicate full participation by minorities

31 PhDs awarded to URMs in 2008

Sources: IPEDS Completion survey by race, US Census
Bachelor and PhD STEM Degrees

Source: IPEDS Completion survey by race
Bachelor and PhD Physics Degrees

Percentage of Total Physics Degrees

Asian American  Hispanic American  African American  Native American  White/Caucasian

Sources: IPEDS Completion survey by race, US Census
Physics Majors

- African American at HBCU
- Hispanic American at HSI
- URM at MSI

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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)

APS Staff

- Ted Hodapp
- Peter Muhorro (Project Manager)
- Arlene Modeste Knowles
- Sara Webb
Project Activities (2009 – 2011)

• Visited ~15 institutions where URM get BS degrees
• Met, listened to students and faculty
• Recruit ~10 research universities to begin discussions of what can be done, and how programs can mesh
• Understand existing programs (e.g., Fisk-Vanderbilt, Columbia, Michigan, Timbuktu Academy, AGEP)
• Gather data on why physics minority undergrads choose not to pursue PhDs
• Several exploratory meetings with various groups
• June 2010 gathering of students, faculty, funders
• Shape ideas of how to move forward
Barriers for URM Physics Majors to Transition to Doctoral Programs

• Unavailable coursework
• Late start in major
• English proficiency
• Impedance mismatch in advising
• Lack of confidence
• GRE subject preparation
• Admissions policies
• Cultural isolation
Project Goals

• Bring minority PhD graduation rate into parity with bachelor rate (roughly double) in 10 years
• Spawn sustainable “Bridge” programs (~5)
  • “Transitional” Master’s
  • Post-bac year(s)
• Improve mentoring / support at doctoral institutions (~20)
• Spread best-practice ideas, advocate on issues
• Change physics department culture to improve graduate education for all students
• Work collectively / centrally (APS) where actions are appropriate and cost-effective
Key Components

- Faculty site leader
- Doctoral-Granting Institution (DGI) visits to Minority-Serving Institutions (MSI)
- Committee on Minorities (COM) climate site visit
- Review of graduate admissions process
- DGI faculty sensitization
- Mentoring of students
- Monitoring student progress
- Resource commitment
- Active recruiting / advocacy by APS
- Establish Bridge Institutions, Partnership Institutions
Bridge 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
• Separate doctoral-level admissions
• Receive graduate-assistantship

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

Received Letters
- California State University, Long Beach
- Chicago State University
- Dillard University
- Florida International University
- Harvard University
- Massachusetts Institute of Technology
- National Society of Black Physicists
- Spelman College
- Southern University
- Stanford University
- Texas State University
- University of Arizona
- University of California, Berkeley
- University of California, Davis
- University of Colorado
- University of Michigan
- University of Puerto Rico, Humacao

Promised Letters
- Columbia University
- Florida Education Fund
- Morehouse College
- New Mexico State University
- University of Maryland
- University of Puerto Rico, Rio Piedras
- University of Texas, San Antonio

Expected Letters
- Vanderbilt University
- Fisk University
- National Society of Hispanic Physicists
Timeline

- Visit MSIs (AY 09/10)
- Meeting with Bridge Programs (November 2009)
- Meeting of DGIs (February 2010)
- Workshop with MSI faculty, URM students, DGI representatives (June 2010)
- Further discussions (Fall 2010)
- Proposal writing / fundraising (Spring 2011)
- Funded project start (Spring 2012)
- First students (Fall 2012)
- First PhDs (2019)
PhysTEC Member Institutions

...committed to improving the education of physics and physical science teachers