APS Texas Section Meeting

7 October 2011
Commerce, TX

APS Minority Bridge Program

Theodore Hodapp
American Physical Society
Director of Education and Diversity
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.
Minority Bachelor Degrees

Source: IPEDS Completions Survey

Normalized to Population Fraction and Number of Physics Majors

- Black
- Hispanic

172
261
105
171

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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

Source: IPEDS Completion Survey by Race

- Bachelor Degree: ~450
- Doctoral Degree: ~35
- Faculty: ~12

~ 20 more PhDs

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URM Physics PhDs Normalized to Minority Population

100% would indicate full participation by minorities

Year

1995  2000  2005

URM Physics PhDs

0%  10%  20%  30%  40%  50%

Sources: IPEDS Completion survey by race, US Census

31 PhDs awarded to URMs in 2008

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Bachelor and PhD Physics Degrees

Percentage of Total Physics Degrees

Sources: IPEDS Completion survey by race, US Census
Physics / STEM Bachelor Degrees

Source: IPEDS Completion Survey
Project Activities (2009 – 2010)

- Visit 10-15 institutions where minority students (African-American, Hispanic-American) students get BS degrees
- Establish personal links with students and faculty
- Recruit ~6-10 top research universities to bring their resources to this problem (faculty and administration)
- Understand existing programs (e.g., Fisk-Vanderbilt, Columbia, Timbuktu Academy, AGEP)
- Gather data on why physics minority undergrads choose not to pursue PhDs
- Discussions with students, DGIs, MSIs, education researchers, community members
- June 2010 gathering of these groups
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 Muhor (Project Manager)
- Arlene Modeste Knowles
- Sara Webb / Bushraa Khatib
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
Project Components

- Recruiting / Relationships
- Establish Bridge Programs
- Partnership Institutions
- Advocacy / Synergy
Project Components

• Recruiting / Relationships
  • Visit large number of MSIs annually
  • Establish research collaborations between MSIs and DGIs
  • Informing students of opportunities and realities
  • Social media to connect students
  • Summer workshop for students and faculty

• Establish Bridge Programs
• Partnership Institutions
• Advocacy / Synergy
Project Components

• Recruiting / Relationships

• Establish Bridge Programs
  • Learn from existing efforts
  • Transitional Masters (2 yrs) or Post-baccalaureate year (1 yr)
  • Institutional components:
    • Mentoring
    • Progress monitoring
    • Financial support
    • Research
    • Coursework (advanced mathematics and physics)
    • Application preparation
    • Social support

• Partnership Institutions

• Advocacy / Synergy
Project Components

• Recruiting / Relationships
• Establish Bridge Programs

• Partnership Institutions
  • Improving graduate education for all students
  • Financial incentive
  • Institutional components:
    • Site leader / champion
    • Mentoring / advising
    • Progress monitoring
    • Social support
    • Re-examination of admissions guidelines
    • Department culture
    • COM visit
    • Common data-gathering/analysis

• Advocacy / Synergy
Project Components

- Recruiting / Relationships
- Establish Bridge Programs
- Partnership Institutions
- Advocacy / Synergy
  - Organize summer workshop
  - Research/publish effectiveness of interventions
  - Common recruiting/application to bridge programs
  - Disseminate information and ideas to physics community
  - Use APS name to spread program
  - Fund raising
  - Oversight
  - Project-wide activities/tasks
Key Components

- Faculty site leader (Champion)
- Doctoral-Granting Institutions (DGI) visits to Minority-Serving Institutions (and vice versa)
- Improved mentoring / support at doctoral institutions
- Review of graduate admissions process
- Faculty sensitization at the DGI
- Resource commitment
- Committee on Minorities (COM) climate site visits
- Active recruiting / advocacy by APS
- Spread best-practice ideas, advocate on issues
- Change physics department culture to improve graduate education for all students
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)
Admissions Bias?

GRE Scores for Physics Subject Test

<table>
<thead>
<tr>
<th></th>
<th>Before Graduate Admission</th>
<th>After Graduate Admission</th>
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<tbody>
<tr>
<td>Female Graduate</td>
<td>580</td>
<td>3.6</td>
</tr>
<tr>
<td>Male Graduate</td>
<td>640</td>
<td>3.7</td>
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</table>

Source: PhD Recipients from Oregon State University