Minority Bridge Program Overview

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

Normalized to Population Fraction

172
30%
35%
40%
1995 1997 1999 2001 2003 2005 2007

105 171 261

Black
Hispanic

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Supply of US Citizens

Physics PhDs

US Citizens

Foreign Citizens

Year


US Citizens

Foreign Citizens

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Minorities in Higher Education

- College Age Population: ~1.5M
- All Bachelor Degrees: ~200k
- Physics Bachelor Degrees: ~320
- Physics Doctoral Degrees: ~35
- Physics Faculty: ~12

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Minorities in Physics Education

![Bar chart showing URM fraction for Bachelor Degree, Doctoral Degree, and Faculty levels]

- Bachelor Degree: ~320
- Doctoral Degree: ~35
- Faculty: ~12

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URM Physics PhDs Normalized to Minority Population

100% would indicate full participation by minorities

31 PhDs awarded to URMs in 2008

URM=Under-Represented Minority
Source: IPEDS Completion Survey by Race
Bachelor and PhD STEM Degrees

- Computer Science
- Chemistry
- Biology
- Engineering
- Math and Stats
- Physics

Percentage of Minorities

BS
PhD
Cumulative PhD Completion Rate for Math/Physical Sciences

Completion Rate (%)

Year

Asian American
White
African American
Hispanic American

70% of others

Source: Council on Graduate Schools

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Project Goals

• Bring minority PhD graduation rate into parity with bachelor rate (roughly double) in 10 years
• Spawn sustainable programs
• Demonstrate models of success
• Change physics department culture
• Spread best-practice ideas
• Work collectively / centrally (APS) where actions are appropriate and cost-effective
• Study/Publish scholarship on programs/ideas
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 Muhoro (Project Manager)
• Arlene Modeste Knowles
• Sara Webb

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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, AGEP)
• Gather data on why physics minority undergrads choose not to pursue PhDs
• June 2010 gathering of these groups
• Proposal in Fall 2010 to bootstrap programs at research universities
## Minority Physics Bachelor Degrees: Top Institutions

<table>
<thead>
<tr>
<th>University</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of PR Humacao</td>
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<tr>
<td>University of PR Mayague</td>
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<tr>
<td>Massachusetts Institute of Technology</td>
<td>6</td>
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<tr>
<td>University of Arizona</td>
<td>5</td>
</tr>
<tr>
<td>University of California-Los Angeles</td>
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<tr>
<td>University of Texas at Austin</td>
<td>5</td>
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<tr>
<td><strong>Florida International University</strong></td>
<td>5</td>
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<tr>
<td>University of PR Rio Piedras</td>
<td>4</td>
</tr>
<tr>
<td><strong>Southwest Texas State University</strong></td>
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<tr>
<td>University of Florida</td>
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<tr>
<td>Harvard University</td>
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<tr>
<td>University of California-Santa Barbara</td>
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<td>University of California-Davis</td>
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<tr>
<td>University of California-Riverside</td>
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<tr>
<td>University of Washington - Seattle</td>
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<tr>
<td>Morehouse College</td>
<td>10</td>
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<tr>
<td>Xavier University of Louisiana</td>
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<tr>
<td>Benedict College</td>
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<tr>
<td><strong>Spelman College</strong></td>
<td>4</td>
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<tr>
<td><strong>Southern University, Baton Rouge</strong></td>
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<tr>
<td>Florida A&amp;M University</td>
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<tr>
<td><strong>Dillard University</strong></td>
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<tr>
<td>Norfolk State University</td>
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<tr>
<td>Tuskegee University</td>
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<tr>
<td>American University</td>
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<tr>
<td><strong>Chicago State University</strong></td>
<td>3</td>
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<tr>
<td>Hampton University</td>
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</tbody>
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Top Physics Doctoral Degree Granting Institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>PhDs per year</th>
</tr>
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<tbody>
<tr>
<td>MIT</td>
<td>38</td>
</tr>
<tr>
<td>Stanford University</td>
<td>33</td>
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<tr>
<td>University of Illinois, Urbana-Champaign</td>
<td>29</td>
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<tr>
<td>Harvard University</td>
<td>27</td>
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<tr>
<td>University of California, Berkeley</td>
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<tr>
<td>University of Texas at Austin</td>
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<td>University of Maryland, College Park</td>
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<tr>
<td>Cornell University</td>
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<tr>
<td>California Institute of Technology</td>
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<td>University of Wisconsin, Madison</td>
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<tr>
<td>University of Rochester</td>
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<tr>
<td>SUNY at Stony Brook</td>
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<tr>
<td>University of Arizona</td>
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<tr>
<td>University of Michigan, Ann Arbor</td>
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<tr>
<td>Pennsylvania State University</td>
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<td>Ohio State University</td>
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<tr>
<td>Princeton University</td>
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<td>University of Colorado at Boulder</td>
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</tr>
<tr>
<td>Columbia University</td>
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</tr>
<tr>
<td>University of Washington, Seattle</td>
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<tr>
<td>University of California, Los Angeles</td>
<td>16</td>
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<tr>
<td>University of California, Santa Barbara</td>
<td>15</td>
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<tr>
<td>University of Minnesota, Twin Cities</td>
<td>15</td>
</tr>
<tr>
<td>University of Chicago</td>
<td>15</td>
</tr>
</tbody>
</table>

PhDs per year, averaged over 5 years. Source: NSF Doctoral Degree Completion Survey

These 10 institutions educate 23% of all physics PhDs granted in the US

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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
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)
- Report / input to APS (late June/early July)
- Further discussions (Now)
- Proposal writing / fundraising (October/November)
- Visit MSIs, build program elements (AY 10/11)
- Funded project start (Fall 2011)
- First PhDs (2018)
Admissions Bias?

![Bar graph showing GRE scores and graduate GPA for females and males before and after graduate admission.](Image)

Source: PhD Recipients from Oregon State University