USC / NSBP Pre-conference Workshop

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The APS Bridge Program: Changing the Face of Graduate Education

Theodore Hodapp
Director of Project Development
Senior Advisor to Education and Diversity
Underrepresented Minority (URM) Physics degrees

Only ~30 students!

Source: National Center for Education Statistics, US Census, and APS
APS Bridge Program: 
Key Features

• **Recruit** students through graduate programs (unaccepted), undergrad programs (promising but uncompetitive, or unsure )

• **Establish** Bridge Sites (6):
  • Year 1: Advanced undergraduate or grad courses, introduction to grad-level research, active mentoring, progress monitoring, social integration into grad school *(Project funds)*
  • Year 2: Take 1*st* year grad courses, apply to PhD program, research underway *(Department funds)*

• **Place** additional students at Partnership Institutions (23):
  • 65 graduate programs looked at “other” applications (2017), recruited additional students; No direct support, some travel
  • “COM approved” Partnership Institutions; national recognition of program

• **Monitor** student/site progress

• **Research**

• **Disseminate / Advocate**
Member and Partner Institutions

**Member Institutions**
- 125 in 38 states

**Partnership Institutions**
- 32 in 18 states
  - 24 PhD
  - 8 MS
Bridge Program Achievements

Bridge Program
Physics PhDs

- 23% Women (20%)
- 93% URM (6%)
  - 64% Hispanic
  - 24% African American
  - 5% Native
- 88% Retention (60%)

PhDs reach same fraction as undergrad degrees

Students

<table>
<thead>
<tr>
<th>Years</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Program</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
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<tr>
<td>Placed/Retained</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
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<tr>
<td>Project Funding</td>
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<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

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Where did the 48 students go (2017)?

- Bowling Green State University
- CSU Long Beach (2)
- CSU Los Angeles (5)
- Delaware State University (2)
- DePaul University
- Fisk-Vanderbilt University (3)
- Florida State University (6)
- Indiana University (2)
- Ohio State University (3)
- Texas A&M University, Commerce
- Texas State University
- University of Central Florida (5)
- University of Cincinnati (3)
- University of Connecticut
- University of Houston, Clear Lake (3)
- University of Kansas (2)
- University of Massachusetts Dartmouth
- University of Minnesota Duluth
- University of North Carolina, Chapel Hill
- University of Rochester
- University of South Florida (2)
- University of Virginia
Physics GRE: Impact of Cutoff Scores

Enhancing Diversity in Graduate Education

- Fraction (White)
- Fraction (Hispanic)
- Fraction (Black)
- Fraction (Asian)

0.09 (Black)
0.34 (Hispanic)
0.61 (Asian)
0.44 (White)

400 500 600 700 800 900 1000

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Admissions Reform

Admissions Committee
• Sense of “Merit” is not always commonly held
• “Standard measures” (e.g., GRE) is not measuring what we think it is measuring
• Student’s career choices are also important critical – academia is no longer the primary (or perhaps even desired) outcome
• Collective or shared decision making improves approach
• Many committees bring irrelevant factors to the discussion

Reform
• Revisit process
• Reconsider standard measures
• Holistic review (in terms everyone can understand)
• Approach the problem from everyone’s perspective
• Growth vs. Fixed mindset
Bachelor and PhD STEM Degrees

Enhancing Diversity in Graduate Education

Percentage of URM

<table>
<thead>
<tr>
<th>Field</th>
<th>BS</th>
<th>PhD</th>
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<tbody>
<tr>
<td>Computer Science</td>
<td>78</td>
<td>639</td>
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<tr>
<td>Biological Sciences</td>
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<td>639</td>
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<tr>
<td>Chemistry</td>
<td>161</td>
<td>161</td>
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<tr>
<td>Engineering</td>
<td>386</td>
<td>386</td>
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<tr>
<td>Mathematics and Statistics</td>
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<td>61</td>
</tr>
<tr>
<td>Physics</td>
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<td>63</td>
</tr>
<tr>
<td>Astronomy</td>
<td>6</td>
<td>6</td>
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</tbody>
</table>
Leadership / Oversight

**National Advisory Committee**

- Emilio Codecido (OSU, Grad student)
- J.D. Garcia (Arizona)
- Yolanda George (AAAS)
- Wendell Hill (UMCP)
- Renee Horton (NSBP)
- Anthony Johnson (Chair, UMBC)
- Ramon Lopez (UT Arlington)
- James Mathis (UM, Grad student)
- Steve McGuire (Southern University)
- Jesús Pando (NSHP)
- Ritchie Patterson (Cornell)

**Architect’s Council**

- Marcel Agüeros (Columbia)
- Ed Bertschinger (MIT)
- Andreas Bill (CSU Long Beach)
- Simon Capstick (Florida State)
- Kelly Holley-Bockelmann (Fisk/Vanderbilt)
- Cagliyan Kurdak (Michigan)
- Garrett Matthews (USF)
- Jon Pelz (Ohio State)
- Talat Rahman (UCF)
- Jon Urheim (Indiana)

**Funding**

- NSF
- APS
- Bridge sites

**Research / Assessment**

- Deepa Chari (FIU-Postdoctoral Assoc.)
- Geoff Potvin (FIU-Research advisor)
- Rachel Scherr (SPU-Project evaluator)

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