National Academies:
Revitalizing Graduate STEM
Education for the 21\textsuperscript{st} Century

23 March 2017
Washington, DC

APS Bridge Program
Erasing the Doctoral Degree
Attainment Gap in Physics for
Underrepresented Minority Students

Theodore Hodapp
APS Director of Project Development
Sr. Advisor to Education and Diversity

Staff:
• Erika Brown (Project Manager, APS)
• Deepa Chari (Postdoc. Assoc., FIU)
• Brián Clash (Project Coordinator, APS)
• Monica Plisch (Management Team, APS)
• Geoff Potvin (Research Advisor, FIU)
• Rachel Scherr (Project Evaluator, SPU)

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)

This material is based upon work supported by the National Science Foundation under Grant No. 1143070. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
URM Bachelor and PhD STEM Degrees

- All STEM disciplines fail to bring URM students from BS to PhD
- No change in last two decades
- Numbers are attainable (need about ~30/year more in physics)
- Critical: Must identify and retain students who are currently unsuccessful

Sources: IPEDS Completion survey by race, US Census
APS Bridge Program: Key Features

**Recruit Promising Students:** grad programs (unaccepted), undergrad programs (promising but uncompetitive, or unsure), website

**Establish Supportive Programs:** Bridge Sites (6), Partnership (21)
- Year 1: Grad or advanced undergrad courses, introduction to grad-level research, active mentoring, progress monitoring, social integration into grad school
- Year 2: Take 1st year grad courses, apply to PhD program, research underway

**Place Students:** Match students post-April 15th with interested programs
- APS Committee on Minorities vets new Partnership Institutions

**Monitor** student/site progress

**Research**

**Disseminate / Advocate**
Partnership Institutions

Non-APS Sites:
- Bowling Green State University*
- Cal State Los Angeles*
- Columbia University
- Delaware State University
- DePaul University*
- Embry-Riddle Aeronautical University
- Fisk-Vanderbilt
- Florida International University
- MIT
- North Dakota State University
- Princeton University
- Texas State University*
- University of Chicago
- University of Cincinnati
- University of Connecticut
- University of Hawai'i at Manoa
- University of Houston, Clear Lake*
- University of Michigan
- University of N. Carolina, Chapel Hill
- University of Rochester
- University of Texas, Arlington

APS Sites:
- Cal State Long Beach*
- Florida State University
- Indiana University
- Ohio State University
- University of Central Florida
- University of South Florida

*Master's degree is highest awarded
• 106 Students placed; 88% retention rate
• Exceeded “30” the number to close the gap in physics
• Most students supported by institutions – demonstrating sustainability
• These students would not be in graduate programs without bridge programs
• Admissions is failing these (and other) students
• Basic retention measures can also benefit all students (induction, mentoring, progress monitoring, peer-involvement, etc.)
• Graduate student groups are a tremendous resource
Research projects in graduate admission:
- No correlations between success in obtaining a PhD and admissions metrics (GRE, GPA)
- Students and faculty differ on interpretations of admissions criteria
- Interpretation of GRE scores by faculty goes against ETS guidance
- Faculty use “fixed” mindset in evaluating students leading to less diverse entering classes

Brian Zamarripa Roman (UCF)
- Found grad admissions and GRE fees too expensive
- Mentor at UTEP convinced him to apply to bridge program
- Excelling at grad courses, one of top students at UCF
- Awarded NSF GRF (Mar 17)

Kevin Galiano (OSU)
- Applied to only 1 program, not accepted, did not understand grad admissions process
- 3.91 GPA in grad courses
- Very productive researcher, with high impact paper under review