

# National Academies: Revitalizing Graduate STEM Education for the 21<sup>st</sup> Century

23 March 2017  
Washington, DC

## **APS Bridge Program**

*Erasing the Doctoral Degree  
Attainment Gap in Physics for  
Underrepresented Minority Students*

**Theodore Hodapp**

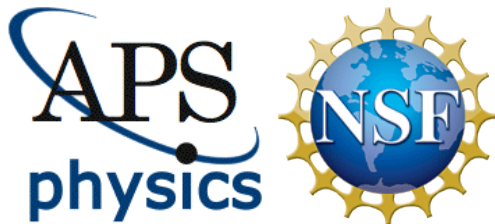
APS Director of Project Development  
Sr. Advisor to Education and Diversity

### **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)

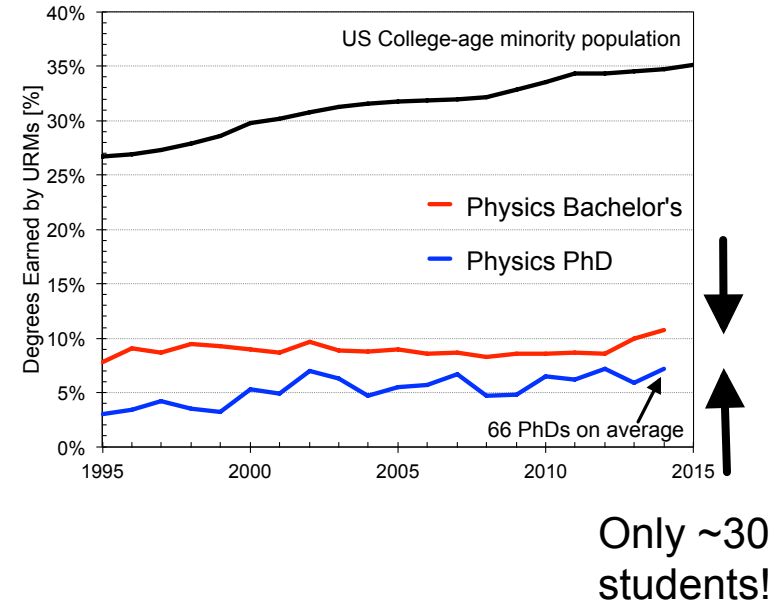
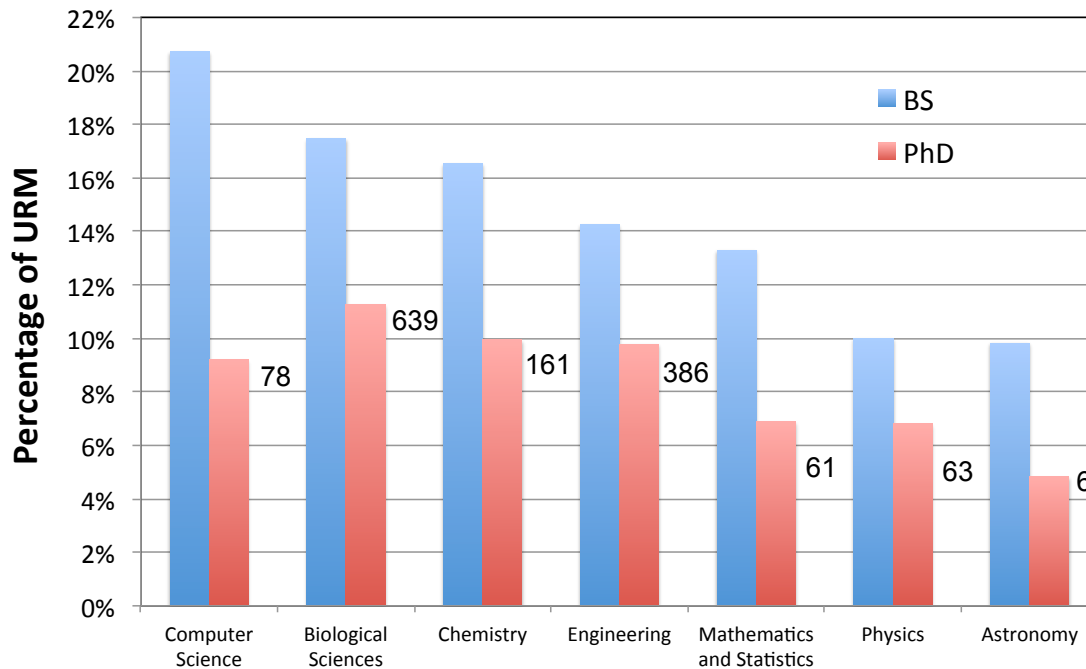
### **Architect's Council:**

- 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)



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# 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 1<sup>st</sup> year grad courses, apply to PhD program, research underway

**Place Students:** Match students post-April 15<sup>th</sup> with interested programs

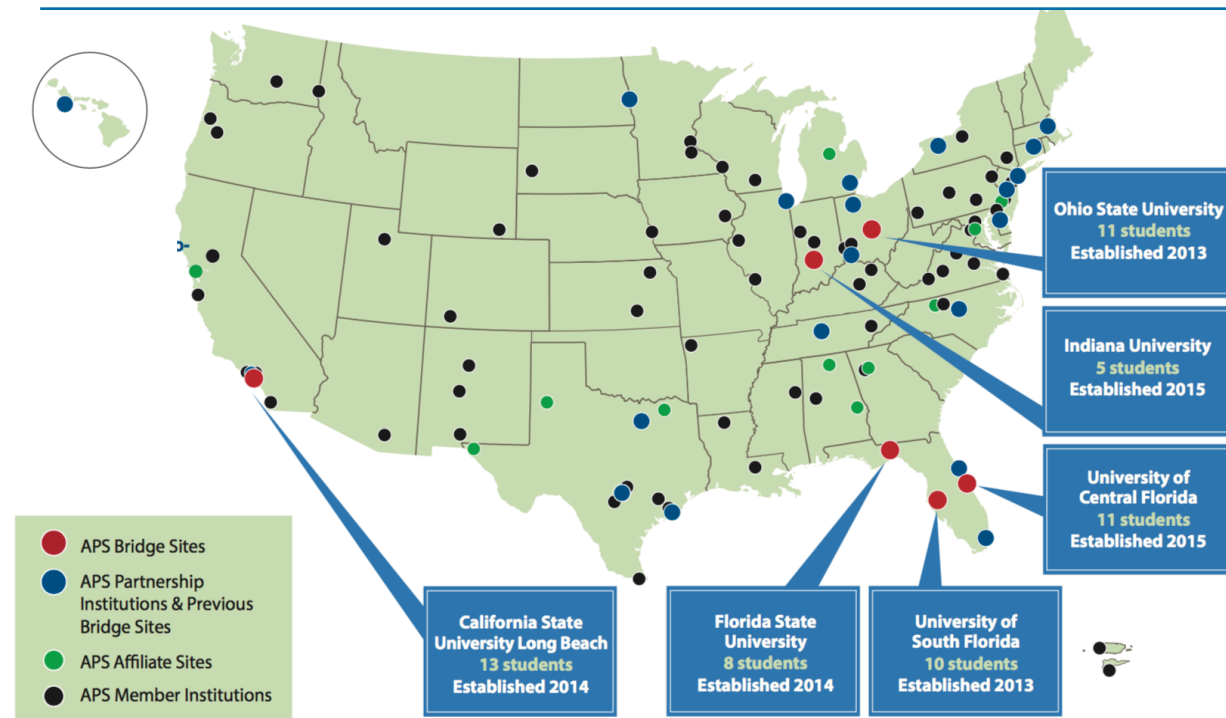
- APS Committee on Minorities vets new Partnership Institutions

**Monitor** student/site progress

**Research**

**Disseminate / Advocate**

# Partnership Institutions



## APS Sites:

- Cal State Long Beach\*
- Florida State University
- Indiana University
- Ohio State University
- University of Central Florida
- University of South Florida

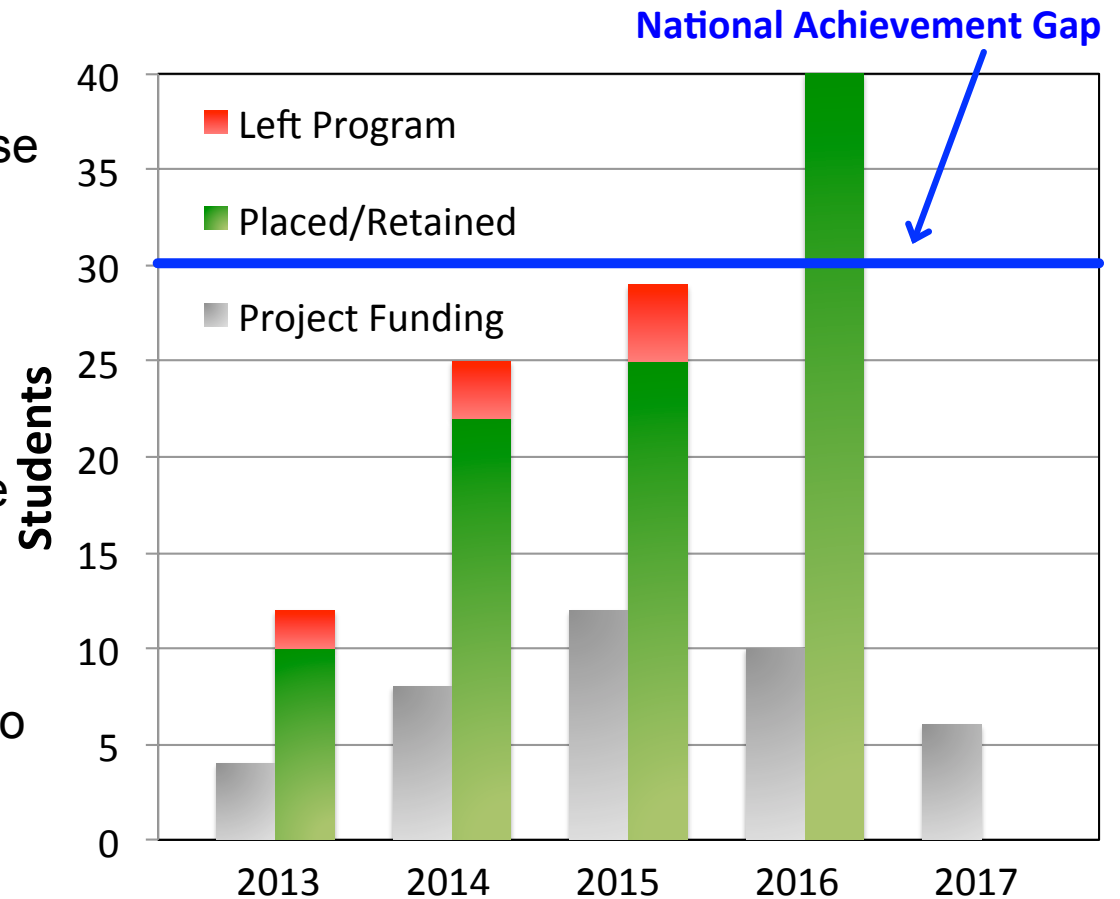
## Non-APS Sites:

- 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

\*Master's degree is highest awarded

# Bridge Program Achievements

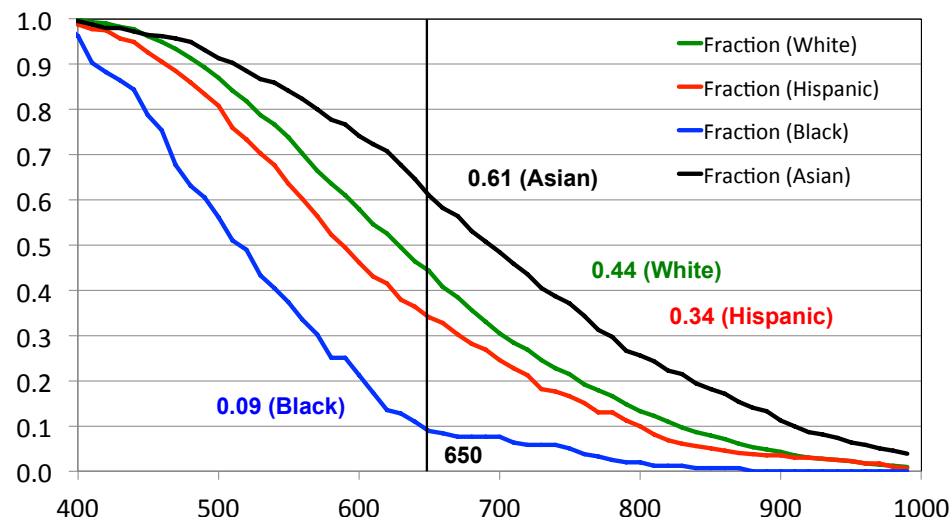
- 106 Students placed; 88% retention rate
- Exceeded “30” the number to close the gap in physics
- Most students supported by institutions – demonstrating sustainability
- These students would not be in graduate programs without bridge programs
- Admissions is failing these (and other) students
- Basic retention measures can also benefit all students (induction, mentoring, progress monitoring, peer-involvement, etc.)
- Graduate student groups are a tremendous resource



# Admissions Process is Failing Many Students

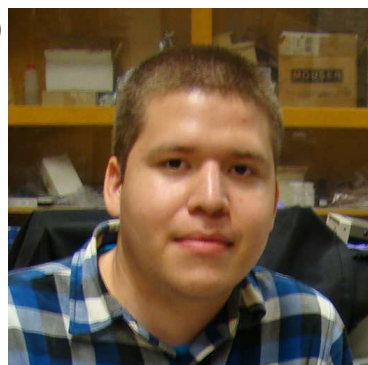
## Research projects in graduate admission:

- 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