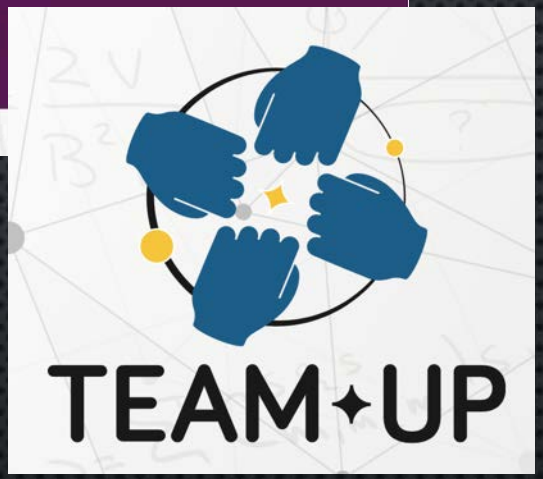
THE TIME IS NOW

Systemic Changes to Increase African Americans with Bachelor's Degrees in Physics and Astronomy



Factor 2: Physics Identity

Diversity Journal Club, 9/10/20

Five Factors for Success or Failure

1. Belonging
2. Physics Identity
3. Academic Support
4. Personal Support
5. Leadership

6. Change Management

Five Factors for Success or Failure

1. Belonging
2. **Physics Identity - "To persist, African American students must perceive themselves, and be perceived by others, as future physicists and astronomers."**
3. Academic Support
4. Personal Support
5. Leadership

6. Change Management

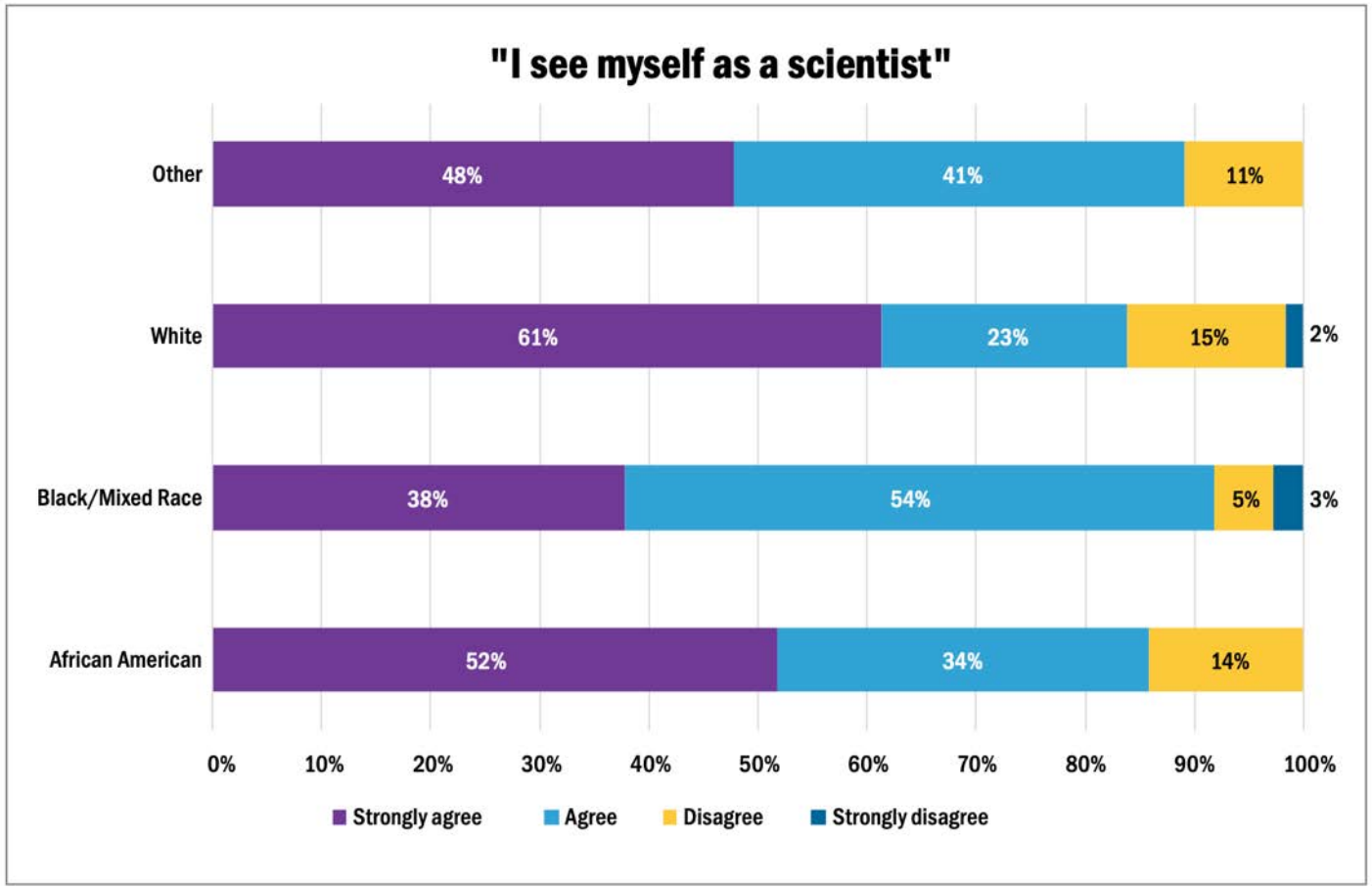


Figure 11: Students' perception of self as a scientist by race. White students more strongly perceive themselves as scientists than all others.
Source: TEAM-UP Student Survey

PHYSICS IDENTITY HAS BEEN DEFINED AS HOW STUDENTS PERCEIVE THEMSELVES WITH RESPECT TO PHYSICS

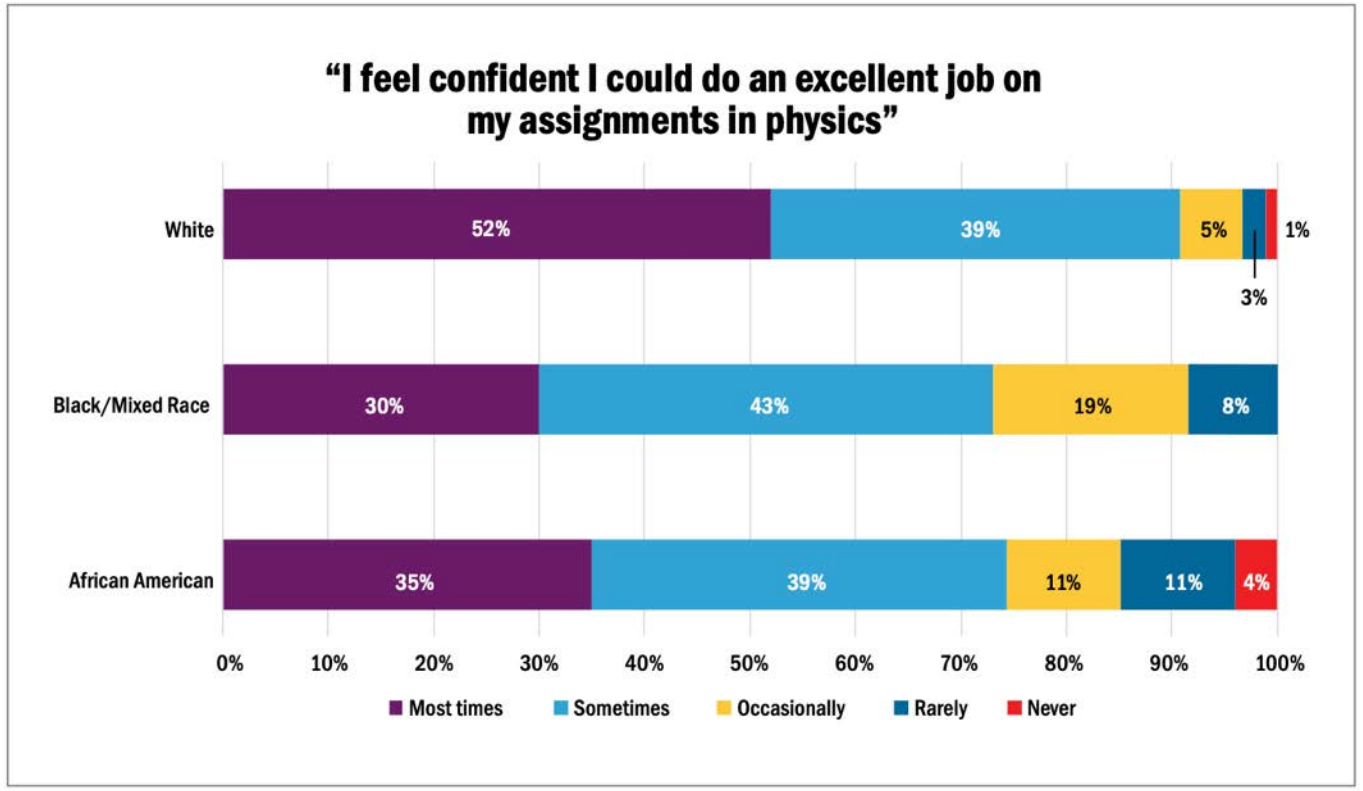


Figure 12: Student confidence on assignments in physics by race
Source: TEAM-UP Student Survey

"Many physicists assume that an early interest in physics, combined with determination,
hard work, and some luck, provides the necessary and sufficient conditions to become a physicist, but this is not supported by research. Such an assumption renders invisible the very real cultural and social impacts that African American students feel and must navigate while also acquiring expertise in their chosen subject (Hyater-Adams et al. 2019). "

KEY FINDINGS

1. Faculty encouragement and recognition are key enablers of physics identity for African American students. Physics identity development increases with the number of faculty who encourage and recognize student success.

2. Participation in research, attendance and presentation at conferences, and working as a Learning Assistant all foster physics identity development.

KEY FINDINGS

3. Faculty of the same race and ethnicity provide helpful role models whose support is especially meaningful to African American students.

3. The connection of physics to activities that improve society or benefit one's community is especially important to African American students

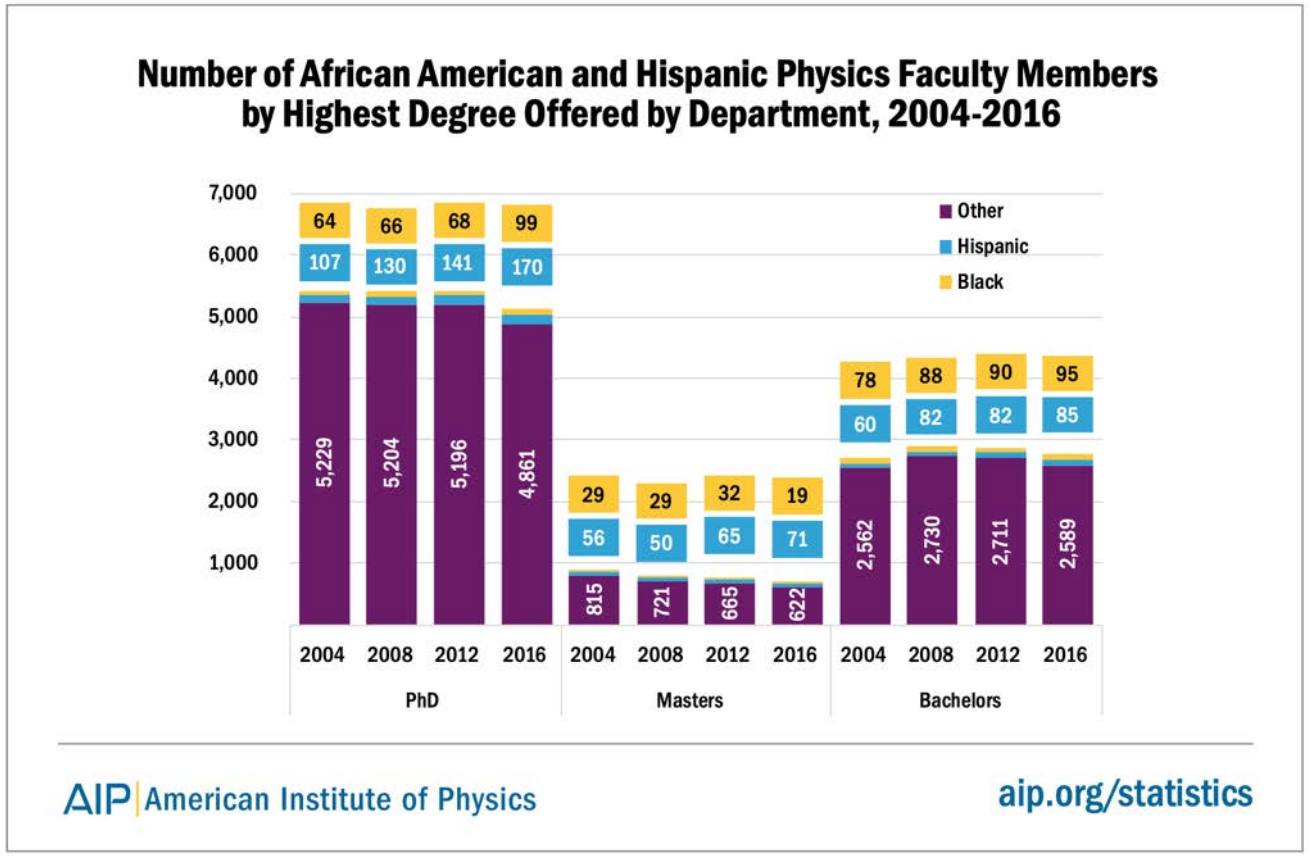


Figure 13: Physics Faculty by race and highest degree offered

TESTIMONY: "I haven't had a Black STEM professor yet. That's one thing that I envy [about] people that go to HBCUs, that they have that type of connection. Yesterday I was looking at the faculty and staff of my physics department and I didn't see any Black faculty on it. It's not necessarily discouraging, but it's like, 'Okay, I guess.' [You've] got to push through; but coming here to this conference, it honestly makes me happy to see this many Black people in physics and Black people in astronomy."

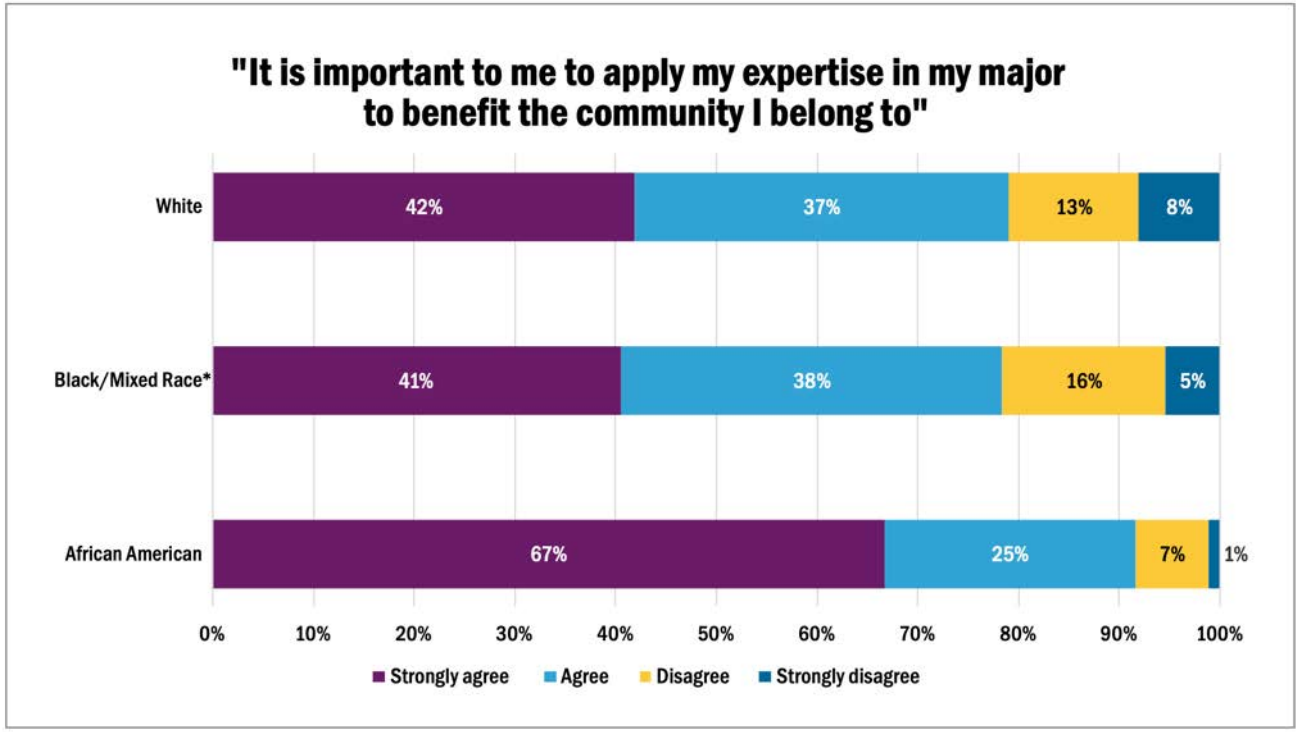


Figure 14: Students' motivation to benefit their community by race
Source: TEAM-UP Student Survey

RECOMMENDATIONS

1. Departments should invite speakers with demonstrated research expertise on physics identity development and should work with faculty on evidence-based ways to strengthen students' sense of physics identity, including encouragement and recognition.

2. Departments should examine whether their current activities foster physics identity, assess their efficacy across race/ethnicity/gender and other social identities, and modify such activities as necessary.

RECOMMENDATIONS

3. Departments should diversify their faculty with respect to race/ethnicity/gender and other social identities in such a way that support of underrepresented students is provided by multiple faculty of varying identities.

4. Departments should communicate the ways in which a physics degree empowers graduates to improve society and benefit their communities, for example by inviting alumni to speak to students about these issues.

5. Faculty should feature and discuss a broad range of career options with undergraduates, utilizing resources such as the AIP/SPS Careers Toolbox and the advice of African American alumni.

WHAT CAN WE DO AT STEWARD TO HELP WITH THIS FACTOR OF "PHYSICS IDENTITY" ?

DICUSSION NOTES 9/10/20:

What could directly make an impact? How to benefit society? (i.e., figure out how to use radar systems to make cars safer)

- Regarding community: "I really enjoyed reading this article on how astronomy impacts society": https://www.iau.org/public/themes/astronomy_in_everyday_life/
- Giving back to community?
  - Outreach an extra thing now, what about including this as a required part of a degree?

- ALSO Social and economic issues, where can we make money?
- Choosing between graduate school and making money. Culture and community = family
- Astronomy and physics can feel very self serving. But there is so much value in what we do – give back through programs and through education. What about in our classroom? What more can we do? Decolonization readings in courses?

- When can we call each other (and ourselves) "physicists"? IF you are doing science you are a scientist!
  - Don't wait until you are done with a Bachler's degree or PhD.
- When can we call ourselves astronomers? How do we grapple with this? (Unlike doctors we can practice right out of undergrads) We can teach this at our classroom levels!
- We need to undo this idea of gatekeeping!
- Important for people above you to consider you and to call you a scientist! Problem of the culture at all levels!
- What about people not in this room? How do we get them to think about these things?