

Commentary

Diversity in physics: Are you part of the problem?

Many leading academic physics departments have no underrepresented-minority faculty members. My own department at the University of Washington has never had an African American tenure-track faculty member. That state of affairs is taken for granted, but it should be regarded as shameful.

At Stanford University in the late 1980s, I was the first tenure-track woman hired in physics; the applied physics department and SLAC still had none. Yet my appointment (granted to increase diversity in the physics department) immediately made the percentage of female physics faculty at Stanford well above the national average. At that time, having no women in a physics department was viewed as normal.

I often get asked, "Why are there so few women in physics?" That anyone would ask that question shows how oblivious many people are to the sexism and bias that permeate our society and physics culture.¹ I may not be able to fully answer the question, but I can tell you why there are women *like me* in physics. Because we love math and nature. Because we like doing computations and figuring things out, step by systematic step. We love the flashes of insight and the excitement of revelations from new data. We revel in breathtaking moments of awe. And we had support, mentors, encouragement, opportunities, and colleagues who gave us a positive view of ourselves as physicists.

Still, there are very few of us in the US. Many great articles are filled with infuriating anecdotes about the obstacles women scientists face.¹ I suspect few of my colleagues have read them. Even when they do read studies addressing gender issues, white men typically devalue them. My impression is that many physicists think the issue is complicated, is "not my fault," and likely has nothing to do with them. Publications about bias often use the word "subtle" for effects that are obvious to those who experience them.²

African Americans, Native Americans, and Latinx and Hispanic Americans are



ALL OF US. Watercolor and pencil on paper (2000). Warren W. Buck, University of Washington, Bothell.

particularly underrepresented in physics, even more so than white and Asian American women. The underrepresentation is even more egregious for African American, Native American, and Latina women. We physicists love data, and the numbers are shocking.³ The reasons for underrepresentation are complex, but they are not subtle. A successful career in science is a difficult achievement; it requires that opportunities, abilities, and interests align and that pitfalls be avoided.

The effects of impediments are magnified for minorities. Without support mechanisms in place, a single conversation, setback, or harassment incident can be inordinately damaging, and every minority physicist I know has received multiple such wounds. Although the problem is entangled with class, early education, culture, and history, simply dismissing it as difficult, throwing a few programs at it, and hoping for gradual

progress is a cop-out and a major failure. Despite several excellent programs and the publicly avowed goal of increasing diversity in physics, the percentages of underrepresented groups are increasing excruciatingly slowly if at all. The percentage of faculty members who are African American actually decreased³ between 2008 and 2012. Even though a similar percentage of incoming African American undergraduates express an interest in physics, as do members of other groups, black Americans at the physics PhD level are underrepresented relative to white Americans by a factor of 8.5.

Addressing the covert and overt racism and the unwelcoming culture in most physics departments is a great place to start correcting the problem. Often I hear physicists say they don't pay attention to race, sex, or discrimination and only are concerned with scientific merit, but problems are not

difficult to notice if you pay attention.

Blatant examples of hostility and discrimination are frequent. Classic examples include minority physicists being told they only got in to some program or received some award because of their race and female physicists being asked about marital status and childbearing plans. One woman accidentally overheard her mentors expressing disappointment that she had married, because “married women always drop out.” Mishandled or covered-up sexual harassment cases have made the news recently (see, for example, *PHYSICS TODAY*, June 2016, page 30), but the publicly reported ones are the tip of the iceberg.

Slightly more ambiguous instances, such as being mistaken for a secretary, a janitor, or a criminal, are even more numerous. Colleagues will tell me that such incidents only happen occasionally and that people should quit being so sensitive. Often I am told about white male physicists who have also encountered serious difficulties—a way to push the blame away. I have been told that more subtle cases of poor treatment are due to individual characteristics of the victim. For instance, if only a woman dressed or presented herself differently she would not be harassed, or someone has just not accomplished enough or has a difficult attitude, as if that would justify disrespecting someone.

Implicit bias is prevalent even among members of underrepresented groups. We all have biases and privileges that we aren’t unaware of. A famous example of unconscious bias occurs in orchestra auditions. When they are done “blind,” so that decisions are made without judges knowing the applicant’s gender, 50% more women are selected.⁴

It is not enough for each of us to be supportive and to strive to overcome our unconscious biases. Members of underrepresented groups often justifiably feel tremendous anxiety and lack of confidence. They can feel alienated by the hostile and competitive culture of science and academia, the lack of encouragement, disparaging comments, and harassment. As a result of the lack of diversity in the field, most physics departments have no faculty members with the sensitivity and knowledge to encourage and mentor students who experience the effects of racism and discrimination.

I saw firsthand, as a faculty member at Stanford in the late 1980s, how the

presence of even one African American faculty member who is an effective mentor can foster a supportive community and make a huge difference. While Arthur Walker was a professor there, Stanford produced more than 40 African American PhD physicists, far more than any other leading research university. Walker was also the PhD adviser of Sally Ride, the first female astronaut. Similarly, the presence of James Young on the MIT physics faculty was critical to fostering a climate that allowed for the success of many African American PhD students, including Shirley Ann Jackson, MIT’s first African American female PhD and the current president of Rensselaer Polytechnic Institute, and Sylvester James Gates Jr, the first African American physicist to hold an endowed chair in physics.

I have heard many times that the lack of diversity in faculty hiring is entirely a pipeline issue. However, a good deal of data and anecdotes show otherwise.^{2,3} The attrition rate for minority PhDs is horrendous, even among those who have received PhDs from top-ranked physics departments. In multiple physics departments, I have witnessed tremendous attachment to the idea that faculty hiring should be an exercise in evaluating scientific merit according to objective criteria. The fact that some candidates have to meet those criteria while contending with bias, hostility, and barriers is generally viewed as a secondary consideration, as is a candidate’s ability to improve the departmental environment for underrepresented minorities.

A frequently used measure of objectivity that is actually discriminatory is for faculty members to informally poll their friends at other universities. The old-boy network of people hiring according to friends’ recommendations still flourishes. It is well documented that people feel more comfortable with and rate more highly those who are like them.⁵ The fact that university administrations typically apply pressure to ensure diversity in candidate short lists is viewed by many faculty with cynicism and may subject minority candidates to additional scrutiny. If we truly care, we must go beyond standard operating mode and place a much higher priority on the ability of faculty members to mentor students from underrepresented groups and to foster an inclusive physics culture. To do that, we must change our

attitudes in hiring decisions and hold our colleagues accountable to do the same.

Let me be clear. If your career is established and you are not making an explicit and continual effort to encourage, mentor, and support all young physicists, to create a welcoming climate in your department, and to promote the hiring of diverse faculty members, you are part of the problem. This is a critical issue of civil rights in our field. Albert Einstein, an activist on the issue of racism, is an excellent example that no matter how great a physicist you might be or what obstacles you have overcome, you have not earned the privilege of ignoring our diversity problem.⁶

In addition to offering encouragement, collaboration, and mentorship, you should be ensuring racial and gender diversity on speakers’ lists, committees, and job short lists and making increased diversity a high priority for all faculty hiring. Not only is the lack of inclusion unfair, but it fails to maximally exploit the talents of a great humanity.

References

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