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## GUEST EDITORIAL: Diversity is Not Enough

*Geraldine Cochran, Rutgers University and Carol Scarlett, Florida Agricultural and Mechanical University*

Let us be clear: diversity is important! However, it is not enough. It is not enough for us to focus on numbers and representation while neglecting to see and understand the lived experiences of actual individuals. We as physicists are in our various fields of physics because we love the challenge of the work we do and the problems we solve, and we are proud of the creativity that we bring to our problem-solving. Some physicists, however, are being faced with challenges and problems that are not related to their research; rather, these challenges relate to their experiences due to their socio-demographic characteristics and their existence in physics communities.

Physicists from marginalized social-demographic groups - including women, non-binary or non-gender conforming individuals, trans persons, LGBTQIA persons, Black/African American, Latinx, Native American, and Asian persons, persons with disabilities, and other marginalized groups - our brainpower, our energy, our creativity is being exhausted on challenges we ought not face.

The physics community should be inclusive. It should be a place where all individuals have access to information, receive credit for their work, are valued in their community, and advance based on their contributions and merit. Unfortunately, this is not the case in the general field of physics and it is not the case in many physics communities or environments, including departments, professional societies, and national labs. So, no, diversity is not enough.

An inclusive environment is beneficial to all people within that environment. Inclusive classrooms and departments are beneficial to all faculty and students interacting with individuals in that department. Inclusive environments within professional societies are beneficial to all members, staff, and the larger society as a whole. Inclusive national labs are beneficial to all employees and users. Thus, it should be the work of all physicists to create and promote inclusive environments. I have heard it said that we need the best minds studying physics and solving scientific problems. If our field is to attract the best minds and retain the best minds, then we must create environments that individuals with the best minds want to join and continue to support.

We should think of inclusion and equity as a mechanism for “practicing diversity;” without which we can get people in the door, but not a true seat at the table. As we move into an era where diversity is even touted, we still see staggering statistics on the numbers of women and marginalized individuals who never reach their full potential and never quite climb the proverbial “ladder of success.” Much of the issue rests not with the good faith attempts to bring in talent from a wide swath of our society, but the lack of infrastructure in place to support people whose ideas, experiences, preferences and outlooks may not fit the model that has already been established or has dominated the workspace. This is why diversifying an incoming group often does not lead to sustained diversification in the workplace or classrooms or laboratory.

Inclusion and equity are what enables people who otherwise fall outside of the norm for a given environment to fully integrate in a meaningful way. Practicing diversity requires one to be willing and able to tap into the entire talent pool available. Thus, lack of inclusion or equity leads to no real diversity. Eventually, as is currently observed, talented individuals simply move on to places where they can achieve their optimal workspace; often leaving behind an environment that is as homogeneous as it was before they were ever recruited.

To see real gains across all defined socio-demographic groups, we must adjust our multicultural mantra from “diversity” to “inclusion and equity” to fully access the talent available. ■



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## Diversity and Inclusion

*Folaranmi Adenola, Physics graduate student at Florida A&M University*

According to authors Karimi & Matous (2018), “diversity in higher education is associated with positive personal, societal, and educational outcomes.” These benefits are best accomplished when diverse groups communicate and interact via formal and casual activities (Karimi & Matous, 2018).

Colleges are not just organizations for making and exchanging learning through research and instructing. Students’ social lives and encounters, particularly within multicultural environments, are basic parts of the college life affecting individual and scholastic accomplishments (Karimi & Matous, 2018).

### **How to Become Inclusive**

However, the goal of creating diversity and inclusion in the field of physics will not be accomplished by only increasing numbers of individuals from different social and cultural backgrounds or marginalized groups. Inclusiveness is generated by welcoming and providing a safe place to allow uncomfortable discussions that challenge the existing state of affairs in the field. This will give everyone a sense of belonging and the confidence to tackle controversial issues in order to create positive solutions. The importance of being in an environment where one’s voice can be heard and ideas can be shared freely without prejudice cannot be overemphasized.

### **Benefits of Inclusion**

In the article “Mapping Diversity and Inclusion” (2018), diversity and inclusion are vital in college settings because they directly correlate to increased feelings of social connectedness amongst students of different cultural and social backgrounds. This also leads to reduced stress levels (Yeh & Inose, 2003). If relationships are established and maintained amongst individuals, displays of higher academic achievement, retention rates, and satisfaction with academic and social experiences are increased (Perrucci & Hu, 1995).

Additionally, support services should be created for all groups represented in the field of physics so that no one feels alone or helpless. Encouraging extra-curricular activities is also very helpful because they serve as important avenues to create and en-

hance connections between individuals with shared interests outside the formal limits of the field.

### **Benefits of Diversity**

In conclusion, creating social and cultural relations plays an essential part in several aspects of students’ and researchers’ involvement in higher education environments. Considering the increased numbers of marginalized groups in the physics field over the years and the yearn for diversification on campuses and research environments, it is everyone’s responsibility to be able to relate with other people no matter their social or cultural backgrounds and beliefs. ■

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## Personal Reflections from a Chicana-Indigenous Physicist

*Ximena Cid, Assistant professor of physics at California State University, Dominguez Hills*

As a Yaqui-Chicana-female physicist, the likelihood of finding a physics colleague like me in these respects is very small. In fact, it is so small that the first time I met another Chicana Indigenous physicist was in the second year of my postdoc. Think about that for a minute; the first time I met someone from my cultural-gendered background was 13 years after I took my first college course, my sixth institution, and countless national and international conferences later. I saw her across the room at the national conference for the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS). This was also at least the 10th SACNAS conference I attended, which has a community completely dedicated to my dual-cultural identities as well as intersecting with STEM. Of all the professional communities I'm associated with, this should have been the one to introduce me to my people, but to this day I have only met her.

I emphasize this to give context to those who have never known how this might feel. Over the years, I have met Chicana/Latinx astro/physicists. I have met Indigenous astro/physicists, but the feeling of finally knowing that I am not alone was a bit overwhelming. What was even more surprising is that I didn't know that meeting her would affect me so deeply. I did not realize how much I needed proof that I was not the only one. The immediate consequences of being one of very few is that I had to learn what was valued by a community that I have more differences with than commonalities.

Fortunately for me, I learned how to navigate this system and found support, but what discoveries have we lost simply because someone else did not learn how to deal with this kind of social isolation? These are the issues that face astro/physicists from diverse backgrounds. We are here for the love of the field, but often the field does not love us back. The social isolation builds over time and, at some point, it will either become too much or we develop coping mechanisms to deal with the trauma of being alone.

The environments in which we work are not designed to support us in addressing this isolation.

When asked what we need to do to fix our issues with diversity, equity, and inclusion, I always ask what has been done already. Physicists need to expand our understanding of what has been done and what is currently being done by other fields. We need to learn from gender studies, ethnic studies, and various other fields in the humanities because much of this work is already out there. We need to stop thinking that STEM lives in isolation; that we can continue to sit at our computers analyzing our data, publishing papers, getting grants, and teaching our courses. Each of us needs to learn about the social constructs that impact what happens in our classes as well as our labs because, at the end of the day, we are still people interacting with society and those interactions have profound effects whether we realize it or not. Our ignorance, or lack of interest, in social construction is no longer an excuse.

There is no one solution. I am, however, extremely hopeful and excited from watching the growing interests in understanding issues surrounding diversity, equity, and inclusion. I'm also excited by the increased availability of professional development workshops, specifically centered on these same issues, from various professional societies at national conferences and I encourage your participation. These workshops have a variety of topics and start at many levels from beginners to advanced understanding. Topics range from imposter syndrome, how to mentor diverse populations, how to work collaboratively with institutions that support diverse populations, how to work with community organizations, how to think about diversity, equity, and inclusion in your home institution, etc. You might struggle while you learn to swim in these new waters, but you will see the benefits of your work in the future generations of students entering into this wonderful world of physics. ■



*Ximena Cid*

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**Each of us needs to learn about the social constructs that impact what happens in our classes as well as our labs.**

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### Need a Speaker?

The American Physical Society maintains online lists of women and minority physicists who are willing to give colloquium or seminar talks to various audiences. These lists are wonderful resources for colleges, universities, and general audiences. The lists are searchable by state, fields of physics, or speakers' last names.

[www.aps.org/programs/women/speakers/](http://www.aps.org/programs/women/speakers/)

[www.aps.org/programs/minorities/speakers/](http://www.aps.org/programs/minorities/speakers/)

## The National Society of Black Physicists (NSBP)

*Dr. Willie Rockward*



*Dr. Willie Rockward*

The needle and thread of the National Society of Black Physicists (NSBP) mission and vision is inclusion and diversity. The stitches of our vision are comprised of the Three Ps: **Purpose**, **Partnership** and **Payment**. Each of these pillars are woven into the fabric of The National Society of Black Physicists using inclusion and diversity.

### **Purpose**

The NSBP purpose aims to promote the professional well-being of African American physicists and physics students within the international scientific community and within society at large. We strive to develop and support efforts to increase opportunities for our members in physics and to increase their numbers and visibility of their scientific works.

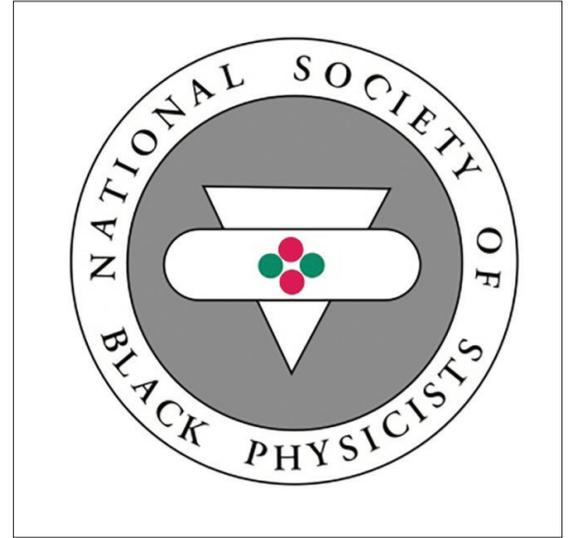
### **Partnership**

One of our primary goals is to actively partner with other sister organizations in providing expert consultation in educational and training efforts directed at underrepresented educational and research institutions, specifically historically black colleges and universities. Our involvement with various workshops, meetings, and conferences with these organizations ensures the diversity and inclusion of minorities in new physics research, opportunities, and opens the door to a large magnitude of opportunities otherwise not afforded to our members at their host facilities or universities.

NSBP also plans, organizes, and hosts an annual conference that brings together a broad range of experts in multiple fields of physics. Our members are afforded this opportunity to attend, network, and participate in what is known as the largest academic meeting of minority physicists in the United States.

Unfortunately, NSBP is a small fish in a rather big pond. While our efforts are tireless and appreciated by our members and physics community, the numbers have yet to reflect what we envision. Minorities still only contribute to a small portion of the STEM work and discoveries happening daily in research lab and facilities around the world. Without constant efforts and reminders, accountability for inclusion would be minimized and numbers will never improve.

Inclusion should be highlighted and advocated not only in writing but in practice. Science leaders



must constantly emphasize and seek out individuals with the potential to put an imprint on development and research regardless of race, gender, sexual orientation, creed, religion, or ethnicity.

### **Payment**

NSBP **payment** is to continue to be a strong advocate for strong two-way involvement for inclusion and diversity, not only on behalf of the physics community but also the public in general. We cannot afford to stifle progress in science and or the potential of progress in science.

NSBP will continue to be a sounding board for this necessary and vital movement and keep the dialogue open with our members, our collaborators, our partners, and any potential associates of the organization about the importance of inclusion and diversity. The goal is to send a clear message to the world that will keep inclusion and diversity in the room of science exploration, experimentation, and research and put it at center stage.

Improving diversity in physics opens the doors for the future generations of minorities to dream. Dreaming opens the door for new developments, creations, and inventions. This will increase minority visibility: the essential goal of the National Society of Black Physicists. ■

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**One of our primary goals is to actively partner with other sister organizations in providing expert consultation in educational and training efforts directed at underrepresented educational and research institutions...**

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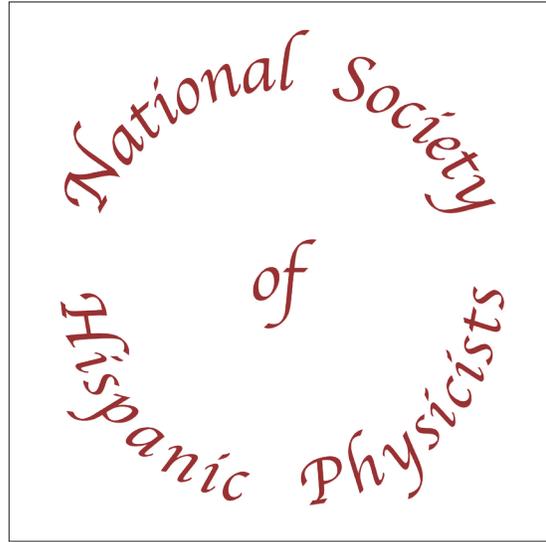
# The National Society of Hispanic Physicists

Ramon E. Lopez, The University of Texas at Arlington

The National Society of Hispanic Physicists (NSHP) is an organization that "...seeks to develop and support efforts to increase opportunities for Hispanics in physics and to increase the number of practicing Hispanic physicists, particularly by encouraging Hispanic students to enter a career in physics." So how do we as an organization do this? What do we do to make physics more inclusive and to attract and support more Hispanic students?

Our major efforts revolve around our annual meeting, that for a number of years has been held jointly with the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS). We take advantage of the professional development opportunities for students that the SACNAS meeting provides, but we also provide physics-specific programming. We organize scientific symposia on various topics in physics at the meeting as well as a Día de la Física, a separate all-day event in partnership with a local university or lab that focuses on physics research, careers, and community.

It is this last element, community, that is perhaps the most important. Expanding opportunities and increasing diversity in the physics enterprise is accomplished one student at a time. We try to connect students to a network of other students and faculty. Students need those networks to access social capital and knowledge that they might not have otherwise. They need to connect to a community that will inform and support them, and that will provide the



Ramon E. Lopez

pathways for them to support students in the future.

Hispanic students are disproportionately first-generation college students. If no one in your family went to college, you have no network on which to rely for appropriate and essential information. Many students don't know that graduate study in physics is essentially free, at least for Ph.D. programs, since such programs pay tuition and stipend to students. Students may not know what to expect when applying to Ph.D. programs.

We try to connect Hispanic students to networks

**We want students to know that there is a broader community that will welcome them and be invested in their success.**

*continued on page 6*



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of other students and faculty who can answer questions and provide advice. We want students to know that there is a broader community that will welcome them and be invested in their success. We also want students to interact with successful Hispanic physics professionals, whether they focus on education, basic research, or applied research and industry. We want students to see that diverse careers in physics are open to them to which they can contribute and provide support to the students who come after them.

Finally, the NSHP forms partnerships with other organizations to increase inclusion and connect students with opportunities. The APS Bridge Program has been extraordinarily successful in expanding the number of underrepresented minority students in physics Ph.D. programs. We are partnering with the APS on a new initiative to build on the lessons learned. We are partnering with the American As-

sociation of Physics Teachers (AAPT) to provide more visibility for Hispanic physicists in the Physics Education community and to bring the benefits of research-based instruction to Hispanic Serving Institutions. Over the years, we have engaged in many joint activities with the National Society of Black Physicists. We regularly form partnerships with local institutions to hold our a Día de la Física at the annual SACNAS meeting, and we have partnered with NASA, Institute of Electrical Engineers (IEEE), and other groups that have supplied financial support and scientific content for our students. If an organization is interested in partnering with us to help bring opportunities to Hispanic physics students, we stand ready to work with them. Contact Ramon E. Lopez at [relopez@uta.edu](mailto:relopez@uta.edu). ■

Visit us online at [www.hispanicphysicists.org](http://www.hispanicphysicists.org).

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**Our major efforts revolve around our annual meeting, that for a number of years has been held jointly with the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS).**

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*2016 SACNAS meeting in Long Beach, CA, with Dr. Ana Cristina Cadavid from CSUN presenting a talk on solar physics.*



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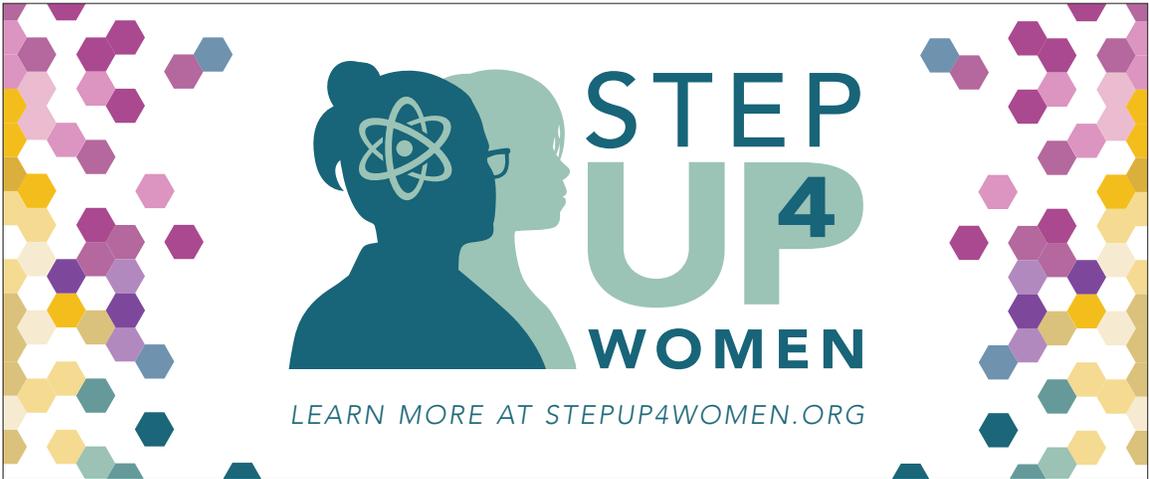
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