GOVERNMENT AFFAIRS
APS Sends Letter to Biden Transition Team Outlining Science Policy Priorities
BY TAWANNA W. JOHNSON
APS has sent a letter to President-elect Joe Biden’s transition team, requesting that he consider policy recommendations across six issue areas while calling for his administration to “set a bold path to return the United States to its position of global leadership in science, technology, and innovation.”

Authored in December by then-APS President Phil Bucksbaum, the letter urges Biden to consider recommendations in the following areas: COVID-19 stimulus support; international collaborations and research security; visas and immigration; domestic workforce; nuclear threat reduction; and climate change.

“My recommendations align with plans you offered during the campaign and can be executed immediately, within your first 100 days in office, or as part of your initial budget request to Congress. Their implementation would dramatically improve the current state of America’s scientific enterprise and put us on a trajectory to emerge from the pandemic prepared to work together and cooperate with our global counterparts,” wrote Bucksbaum.

Current APS President Jim Gates added, “These priorities will not only benefit the physics community, but they will, if implemented, lead to outcomes that could improve the lives of many Americans.”

The recommendations, as stated in the letter, are as follows:

GUIDE CONTINUED ON PAGE 5

MEETINGS
Lessons Learned from a Successful Year Online
BY LEAH POFFENBERGER

 Early in 2020, APS made the tough call to cancel its in-person meetings, shutting down two of its largest conferences. The APS Meetings Department has been able to quickly pivot to organizing conferences in the online world and lending support to APS membership units holding their annual meetings in 2020.

In November, three APS Divisions held their annual meetings online, testing new virtual meeting platforms, and recorded higher than expected audience numbers at each meeting. The Division of Nuclear Physics (DNP) attracted over 1500 attendees, more than their typical attendance of around 800. The Division of Plasma Physics (DPP) and the Division of Fluid Dynamics (DFD) drew 2200 and 3200 attendees respectively.

These highly successful meetings come at a time of rising costs to hold conferences online, especially for meetings with thousands of registrants signing on at the same time. DNP, DPP, and DFD were among the first online APS meetings to charge a registration fee—about half of the usual cost to register for an APS meeting for regular members with a larger discount for students.

“Running these conferences can cost a lot of money—there’s like TV, and you have to pay for commercials and airtime…There is a lot of value like TV, and you have to pay for commercials and airtime…There is a lot of value in being on-screen, but also a cost—whether direct or indirect that, he adds, there are more than a million organizations that bold conferences and demand for virtual meetings has surged owing to the COVID-19 pandemic.

“Companies charge money to run these meetings, and especially for large meetings—you can’t have a Zoom session with 10,000 people so we have to have a company that has a lot of servers and bandwidth,” says Michael Brown, DPP Chair Elect and professor at Swarthmore College. “One thing these companies provide is that they record everything, and the talks are available for a year afterwards. Virtually everything that whole week was recorded. If you still have your registration, it’s like the conference is still going on. That’s a service that isn’t free.”

According to APS Chief Financial Officer Jane Hopkins Gould, APS-sponsored meetings are not a profit maker for the Society. “While it is our goal to cover all of the direct costs, most meetings do not produce sufficient revenue to cover the direct costs plus the internally allocated costs,” she notes. “Advancing and diffusing the knowledge of physics through APS meetings is a core mission activity and one in which APS and its members jointly invest both time and resources.”

APS has also learned that most participants register just before a virtual event. “Unlike an in-person meeting which has fixed as well as variable costs that depend on attendance, a virtual meeting is primarily a fixed cost,” explained Gould. “Regardless of the price of events that have a high-quality experience.”

In 2020, APS tested a number of virtual platforms and a number of pricing structures. “The goal of APS meetings, whether in person or virtually, continues to be making them financially accessible to physicists from across the world while maintaining easy access to the highest quality content, whether live or asynchronous,” said Gould.

In order to support and broadcast the events of an online meeting, APS decided to offer paper sessions to virtual exhibit halls, both DPP and DFD opted to use Bravura Technologies to host their meetings. Bravura has partnered with APS before on the phone app for in-person March and April meetings. DNP opted to partner

GOVERNMENT AFFAIRS
New APS CEO: Jonathan Bagger
BY JONATHAN BAGGER

Editor’s note: In December, incoming APS CEO Jonathan Bagger met with APS staff to introduce himself and answer questions. We asked him to prepare an edited version of his introductory remarks for the entire membership of APS.

1 I goes almost without saying that I am both excited and honored to be joining the American Physical Society as its next CEO. I look forward to building upon the many accomplishments of my predecessor, Kate Kirby. But before I speak about APS, I should tell you a bit about myself.

I grew up in New Jersey, the oldest of four children, and the only one who went into science. My journey started in middle school, where the physics club was a really fun experience. We had great fun doing experiments almost every day, discovering our own laws of physics, with greater or lesser success. Every so often, the teacher, Matt Kashuba, stepped in and nudged us back on track. It was a wonderful experience. (High school physics was another matter; the labs with water and ripple tanks were memorable for all the wrong reasons.)

I went to Dartmouth College in New Hampshire, where I had an amazing freshman year course taught by Bruce Pipes. Oh, did we struggle, but my friends from that experience remain friends

BAGGER CONTINUED ON PAGE 6

MEETINGS
GUIDE CONTINUED ON PAGE 5

GROWTH AND INCLUSION
CAREERS
Careers 2021 Provides Up-to-Date Content for Job Seekers
BY LEAH POFFENBERGER

At year-end, APS launched Careers 2021, the first APS Careers guide, featuring nearly 80 pages of articles, profiles, and other content aimed at students, early career physicists, and other job seekers. While some of the plans to distribute hard copies of the guide at in-person APS meetings were thwarted by COVID-19, the online edition garnered 85,000 views, supporting valuable career advice to APS members.

The next edition of the guide—Careers 2021—is ready to launch, with more updates for today’s job seeker. Careers 2021 contains new articles on career paths in physics, APS career-related programs, and an employer directory of companies currently looking to hire physicists.

“We’re really excited to be putting this guide out again,” says Crystal Bailey, Head of Careers Programs at APS. “We’re hoping to really push this out to the APS community in 2021 and to get this into the hands of as many members as possible.”

Like its predecessor, Careers 2021 will be available online, and a hard copy will be mailed to every undergraduate member of APS, but there are plans in place to get more copies to attendees of APS meetings.

The [National Mentoring Community] conference is going to do a physical mailing to every registered attendee and copies will be mailed out after the Conference.
The second day of the conference in the future. NSF program officers interested in partnering with REUs representatives from institutions day of the meeting featured a session meeting held since 2016. The first the meeting to ensure a seamless running the technical pieces of APS was responsible for assisting assess program impact, and how improve their programs, how to days to discuss how to launch or at their own institutions for three individuals interested in starting REUs current REU leadership and individual REU sites and the entire physics REU community.

"I like to think of the 510 Physics REU sites across the US as hubs of opportunity for undergrads to advance their careers, with the NPNRLG connecting these hubs into a network," says Daniel Serrano, NPNRLG Chair. “The site directors’ meetings allow us to shape and strengthen those connections by coming up with common values and goals, planning collaboratively, and sharing ideas about how to make our programs better.”

To learn more about NPNRLG, visit aps.org/programs/education/undergrad/physicsnprlg.cfm.


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January 1965: Roger Penrose’s seminal proof of black holes

he eminent physicist Roger Penrose won the 2020 Nobel Prize in Physics “for the discovery that black hole formation is a robust prediction of the general theory of relativity,” sharing the prize with Reinhard GENZEL AND Andrea GHEZ, “for the discovery of a supermassive compact object at the center of our galaxy.” But the rough concept of a black hole dates back to the 19th century, before Albert Einstein had even formulated his general theory of relativity and before Penrose’s dissertation was published.

British astronomer John Michell wrote a foundational paper in November 1783, later published in the Royal Society’s journal, that was the first to speculate on the existence of black hole-like objects. His intent was to discover a useful method to determine the mass of a star. He thought he could measure how much the speed of light was reduced by passing light from a star through it; it ought to be reduced differently because of the reduced energy. He could conceivably compare the refracted images of different stars to determine the difference in their respective gravity, and from that, calculate their respective masses. Michell understood the concept of escape velocity and that this critical speed would be determined by the mass and size of the star. He pondered what would happen if a star were so massive, and its gravity so strong, that the escape velocity was equivalent to the speed of light. He concluded: “If the semi-diameter of a sphere of the same density as the Sun in the proportion of five hundred to one, and by supposing light to be attracted by the same force in proportion to its (mass) with other bodies, all light emitted from such a body would be made to return towards it, by its own proper gravity.”

This would render that star invisible to astronomers. He thought there could be many such objects in the universe, undetectable because they emitted no light. Michell also speculated that the motion of binary star systems could help scientists indirectly detect these “dark stars.”

Some 13 years later, French polymath Pierre Simon Laplace independently came to a similar conclusion. In his 1796 treatise, exhibition du système du monde, he specifically considered the case for a star so massive its escape velocity would exceed the speed of light and provided an explicit mathematical formula for Michell’s “dark star” hypothesis.

Gerard Mourou, Albert Einstein developed his general theory of relativity, revolutionizing our understanding of spacetime and gravity, thereby opening up an entirely new realm of the theoretical possibilities. Physicists began exploring those possibilities almost immediately, most notably Karl Schwarzschild, who was then serving at the front during World War I. While sheltering from heavy gunfire, Schwarzschild found himself fiddling with different solutions to Einstein’s field equations, eventually discovering a point where those equations “bore up.” This work was an early mathematical description of what we now know as a black hole. (Robert Dicke is credited with coining the term in 1965, although it was John Wheeler who popularized it.)

For several decades afterwards, physicists largely considered black holes to be purely theoretical objects, rather than something that might actually exist in the universe. Granted, in the 1950s, J. Robert Oppenheimer and Hartland Snyder mathematically demonstrated that a massive star could collapse to form a black hole. They concluded in a 1939 paper that the black hole would “eclipse itself off from any communication with a distant observer; only its
The website for the APS IMPact Mentoring Program, the Society’s resource for connecting young physicists with industry mentors, has been relaunched with a new look and better features. According to Dan Pisano, Director of International Engagement at APS, the refreshed site is designed to be more useful by matching students with industry representatives.

The goal of the IMPact Mentoring Program is to match students, post-docs, and early-career physicists with industry representatives.

APS responds four recommendations across 90 days. At the conclusion of their interactions or at 90 days (whichever comes first) a questionnaire is sent out to gauge the degree of satisfaction. The survey results after 90 days show that 96% of mentors would “certainly” do this again, and 87% of mentees would “certainly” recommend the program to a peer.

The program is part of APS’s vision that “all graduating physicists consider APS their home professional society throughout their careers.” According to Francis Staley, APS Chief External Affairs Officer, “We know that more than 70% of graduating physicists feel employed upon graduation. Likewise, those mentors who may also be seeking to hire can tap into a global pool of young physicists.”

The site’s matching algorithm has been adapted to accommodate international members who wish to be mentees or mentors.

“This platform recognizes that we’re all interconnected. We hope that students from around the world will be able to connect with a mentor in any country in which they choose to work. Likewise, those mentors who may also be seeking to hire can tap into a global pool of young physicists,” said APS President-Elect, Kristi Kumar (UIowa Amherst). Broadly, these include the structure of nuclear, neutron astrophysics, the structure of protone and neutrons (so-called “cold quantum chromodynamics”), the study of quarks and gluons at high temperature (so-called “hot quantum chromodynamics”), and the study of the fundamental nuclear forces and their role in the evolution of the early universe.

This is an especially busy time in the world of nuclear physics given the construction of two major new accelerator facilities: the Facility for Rare Isotope Beams (FRIB) at Michigan State University and the Electron-Ion Collider (EIC) at Brookhaven National Lab. Started to start FRIB is scheduled to be completed in 2022 and the EIC FRIB will provide intense beams of rare isotopes (that is, short-lived atomic nuclei that exist on Earth) that will allow further study into nuclear structure, the origin of mass and spin, the forces that shaped the development of the universe in the moments after the Big Bang.

Groundbreaking for the construction of EIC—a 2.4-mile-circumference particle collider—will take place in October. This facility will be uniquely positioned to address important questions about nucleons (that is, neutrons and protons), including how mass and spin arise and the possibility of discovering the forces that shaped the development of the universe in the moments after the Big Bang.

A particular point of pride for DNP is the IMPact Mentoring Program, an intervention to ensure that the membership was ensuring that the membership was being engaged in their own profession. This program, an intervention to ensure that the membership was engaged in their own profession, is one way that APS can support the participation of women and under-represented minorities in the nuclear physics community.

Collaborative relations have been strengthened in terms of increased interactions among the various APS units. The DNP Division of Nuclear Physics and the Division of Particle Physics have partnered with APS units such as the Division of Gravitational Physics (DGRV), Astrophysics (DAP), and Particles and Fields (DPF)—encouraging cross-talk and collaboration among these closely related branches of physics.

Looking to the future, the DNP executive committee’s goals are many. “Coming into a leadership role, my primary focus was to further cement what I see as DNP’s greatest strength, which is to bring together broad swaths of researchers and applied physics practitioners who are interested in fundamental understanding of the inner workings of the universe over the entire range of observable length scales—from subatomic to intergalactic,” explained Kumar. Since the onset of the COVID-19 pandemic, this emphasis has extended to ensuring that DNP members are able to communicate and network with the same pace and intensity as before, despite pandemic-related restrictions.

Complementing this, Greene underscored the importance of promoting the participation of women and under-represented minorities in the nuclear physics community. “It’s still the case in physics that participation on the part of women is only about 20%,” she explained, “and at the professor level it falls to about 8%.” DNP in particular is composed of about 15% women, placing it among the top five APS divisions for gender diversity, but with room for growth.

An important action the division has taken to this end is the establishment of the DNP Allies Program, an intervention to ensure that conferences are as inclusive and as comfortable for people as possible and to reduce the impact of harassment (whether intended or unintended) may have on the field of nuclear physics. The program trains “allies” from the nuclear physics community to help people who may feel harassed. Wearing bright orange scarves or armbands, allies are easily identifiable at the DNP Annual Meeting and are on alert for anyone who may be feeling uncomfortable and available to talk and provide guidance to meeting participants who have experienced harassment. “There is still so much work to do around representation,” noted Greene, “especially for a younger person in nuclear physics, it doesn’t take many negative comments before you start to feel out of place.”

Greene also highlighted increased public outreach about the exciting advances in nuclear physics as a goal for DNP. “Taxpayers are funding much of this research, and they should get some fun out of it,” she pointed out.

Overall, with a well-deserved reputation, DNP stands out as a cornerstone of research and innovation at APS. “Science isn’t something that happens in a vacuum,” Greene explained. “It takes place in the context of a community, and DNP represents that community.” According to Kumar, “Any APS member who has a keen interest in the physical universe and the problems, challenges and techniques that are employed and further developed to advance our fundamental understanding of its fundamental constituents, evolution and observed properties would profit from engagement within our vibrant community.”

More information on this unit can be found on the DNP website.

The author is a freelance writer in Stockholm, Sweden.
Together, APS OGA and Society Members Set Record for Actions in 2020

BY TAWANDA W. JOHNSON

As part of the Society’s ongoing Advocacy During Congressional Visits Day 2020, nearly 70 APS members participated in the 2020 Congressional Visits Day to Capitol Hill to advocate for the Society’s science policy priorities.

"One year ago this month, Harvard University Chemistry Department Chair Charles Lieber was arrested for falsely denying to federal investigators that he had participated in a talent recruitment program supported by the Chinese government. The Department of Justice (DOJ) later added charges of filing false tax returns, alleging Lieber failed to report income received from the Wuhan University of Technology, which recruited him to establish a research lab.

The case marked an escalation in DOJ’s “China Initiative,” which it launched in November 2018 to increase resources devoted to prosecuting cases involving the misappropriation of U.S.-funded research, among other matters. To date, the Department has brought more than 25 researchers through the initiative, of which the majority are university professors or visiting academics. Many of the cases are still pending, including that of Lieber, who has pled not guilty.

US Arrests of Scientists Rol Research Community

BY MITCH AMBROSE

One year ago this month, Harvard University Chemistry Department Chair Charles Lieber was arrested for falsely denying to federal investigators that he had participated in a talent recruitment program supported by the Chinese government. The Department of Justice (DOJ) later added charges of filing false tax returns, alleging Lieber failed to report income received from the Wuhan University of Technology, which recruited him to establish a research lab.

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Though DOJ has prosecuted several industry researchers for trade secret theft, the cases involving university-based scientists largely hinge on a variety of fraud charges, such as failing to disclose funds received from China. In concert with DOJ, over the past two years grantmaking agencies such as the National Institutes of Health (NIH) and National Science Foundation (NSF) have ramped up investigations of researchers suspected of failing to disclose foreign sources of grant support or other foreign ties.

In June 2020, NIH reported it had contacted institutions with concerns about 189 scientists, of which 175 had some form of undisclosed connection to China. In an effort to identify any inappropriately funded research, NIH and NSF conducted thorough reviews of nearly 25,000 awards. NIH also revealed that 54 of the scientists resigned or were fired as a result of the investigations. NSF subsequently disclosed that in cases involving similar investigations it had taken administrative actions against 25 researchers, such as suspending or terminating their grants.

The scale of the firings and enforcement actions has unsettled many in the research community, with some advocacy groups arguing the government is unfairly targeting scientists with connections to China and harshly punishing what amounts to administrative violations. Meanwhile, federal officials maintain they are rooting out serious violations of agency policies and research norms concerning transparency and reciprocity in international collaborations.

Another escalation in the China Initiative came when five visiting researchers, including:
APS Joins Other Global Physics Societies in Open Access Statement

By David Voss

APS has joined 15 other international physics societies in a call for universal access to knowledge and a commitment to sustainable open access. The statement, titled “Achieving Open Access in Physics,” reaffirms the innovative ways that the physics community has long supported open access (OA) through its preprint server (arXiv.org) and fully OA journals. The physics societies caution, however, that some government mandates such as requirements proposed by COALITION 5—a group of EU funding bodies—would harm the freedom of researchers to choose the most appropriate venues for publication and would undermine viability of physics publishing that depends on high-quality peer review.

APS has long been at the forefront of open access, having launched its first OA journal, Physical Review Accelerators and Beams (PRAB) as early as 1998. Its current portfolio includes five fully OA journals: Physical Review X, Physical Review Research, PRX Quantum, Physical Review Accelerators and Beams, and Physics: Education and Research. In addition, in early 2013 APS transformed some of the largest, most-cited, and most-trusted peer-reviewed, primary research titles in physics into hybrid journals offering authors an option to publish individual articles open access. The joint statement notes that more than 85% of physics papers are published in hybrid journals, but that COALITION 5 would forbid researchers from publishing in hybrid journals, including those in the Physical Review family.

The statement also points out that a shift from the reader-pays subscription model to a researcher-pays OA system will require a substantial realignment of funding structures. “Broader global financial support for OA will need to be in place before most hybrid physics journals can viably transition,” the statement says. “Adjustments to the global flow of funding will take time.”


In emphasizing the joint commitment, the statement concludes that “Physicists will continue to innovate in OA and open science, and physics societies endorse any and all OA models that can provide financially sustainable support for author choice and the quality of peer review and publication upon which excellent physics research relies.”

The text of the statement is available at go.aps.org/2Rj3P8D.

APS Career Guides and other resources and advice for job seekers are available at aps.org/careers.

“Not only does the guide provide insight into the possible paths you can take after you get your degree in physics, but it showcases employers who are in need of and appreciate people with a background in physics. This is the best part of the career guide for me,” says Jorge Garcia, an APS Student Ambassador and a graduate student at New Mexico State University, about Careers 2020. “It gives you the names of companies, what kind of work they do, and what degrees they look for in an employee. This gives a lot of insight into where your background is needed and helps focus your efforts in positions and companies that are a match for you.”

The employer directory included in Careers 2021 promises to be just as useful, since it’s a re-print of last year’s list, but a brand-new list of companies who are currently hiring.

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“I think the most useful part of this guide, read it thoroughly, and to as much of an extent as possible, try to get in touch with these companies who put themselves in the directory—they really are interested in hiring,” says Bailey. “These are companies that chose to participate during COVID—they’re hiring now...consider using LinkedIn to find contacts to do informational interviews and really learn about what the company is doing.”

Frederic Bien, an APS Student Ambassador and a graduate student at New Mexico State University, says Bailey. “There is a wide variety of career paths beyond academia and career mentors might struggle with knowing what those careers are—and this guide can help.”

Careers 2021 is the result of a second year of a partnership between APS and the Institute of Physics Publishing (IOPP) to provide high-quality career resources to APS members. Last year’s guide, despite some setbacks in distribution due to COVID, received great reviews from those who received it, especially from students at the CUNY and those involved with the APS Student Ambassador program.

Further Reading:

HISTORY CONTINUED FROM PAGE 2

gravitational field persists,” they concluded in a 1969 paper. But most of the solutions answered Penrose’s challenge of figuring out a singularity. The result was a January 1965 paper in Physical Review Letters entitled “Gravitational Collapse and Space-Time Singularities.”

Four years later, Penrose came up with his “weak cosmic censorship” conjecture, followed by his “strong cosmic censorship” hypothesis in 1979, which is still widely regarded as one of the most significant unresolved challenges in theoretical physics. The gist: a black hole’s singularity could not be “naked”; it had to be covered and forever hidden behind the event of the horizon. There would, however, be a visible, strongly curved (though finite) exterior region.

Penrose even figured out a complicated process (now called the Penrose process) by which some of a rotating black hole’s gravitational energy might be extracted. Specifically, spacetime is dragged along with the black hole’s rotation, producing a dramatic effect because of the strong gravitational forces involved. There is an “ergosphere” just outside the event horizon, and any observer within it will be carried away with the rotation too.

Penrose imagined shooting a projectile into the ergosphere, splitting it in half. One half falls into the black hole, and the other escapes. This process could produce an escaping half with a greater total energy than the original projectile, which could then be extracted from the black hole. Roger Blandford and Romual Znajek later used this insight to build their own realistic model of how to generate power with a rotating black hole. No longer merely exotic objects existing primarily in theory, black holes continue to fascinate physicists and spur both theoretical and experimental breakthroughs. As recognized by the Nobel committee, Genzel and Ghez discovered the existence of a supermassive black hole at the center of our galaxy, helping to bring black holes to life outside of theory.

Further Reading:
Chinese researchers were arrested over the summer on charges of lying about their affiliations with the Chinese military on visa applications. The head of DOE’s National Security Division, John Demers, asserted at an event last month that more than 1,000 Chinese researchers affiliated with the Chinese military subsequently left the US, purportedly prompted by the arrests and an associated closure of the Chinese consulate in Houston. Demers dismissed accusations that the government is engaging in racial profiling, remarking, “We’re very careful about the way we talk about this problem because we don’t want it to become about the Chinese people.” He added, “You’ll see a great mix of defendants when it comes to ethnic backgrounds; we are very much focused on behavior.” Pushing back on criticism that DOE has leaned heavily on fraud charges rather than make more serious allegations of criminal conduct, Demers remarked, “Are those administrative violations?”

I don’t know. I mean, those go to the core of integrity at an academic institution. And an academic institution is all about disclosing sources of funding so that people who are reading your research can figure out how to read that research. And that’s true regardless whether your funding is coming from the alcohol and beverage industry or whether your funding is coming from the Chinese government.”

He continued, “The focus is on disclosure, and our cases there reflect a desire to tailor our approach to the values of those institutions, which are transparency and academic integrity.”

The author is Director of FYI.

Published by the American Institute of Physics since 1989, FYI is a trusted source of science policy news that is read by congressional staff, federal agency heads, and leading figures in the scientific community.

BAGGER CONTINUED FROM PAGE 4

ARRESTS CONTINUED FROM PAGE 4

Call for Nominations

Propose sites that you feel should be officially recognized for their historical significance to physics.

Deadline: January 31, 2021
goa.aps.org/historic-sites

Physics Teacher Education

PhysTec encourages these colleges and universities for graduating 5 or more physics teachers in the 2019-2020 academic year.

The 5+ Club

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Rutgers, The State University of New Jersey (7)
Boston University (5)
Stony Brook University (5)
Texas State University (5)
University of Texas at Austin (5)

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aps.org/apsnews

There are challenges and opportunities along each of these dimensions. Together with our members and their elected leaders, we will have to work with each of them. They are all important pillars of the Society. How can we do better? Perhaps, I think they reinforce each other in critical ways.

My vision for physics more generally is both broad and inclusive. When I was being trained in physics, we placed high walls around our laboratory. Sometimes it was too complex, we’d say, “oh, that’s chemistry,” or if it was a little too messy, we’d say, “oh, that’s biology.” That’s fine. But as a luxury we can no longer afford.

Today, across the globe, society is facing existential issues in many areas, including climate, energy, infectious disease, and food security. Progress will require multidisciplinary, multigenerational, fact-based solutions. Physics, with its collaborative culture and analytic approach, has a role to play.

And frankly, if we don’t step up, our field will become irrelevant.

Addressing these issues will require cooperation and collaboration, with many people engaged, each bringing their own talents and perspectives. We will need all hands on deck—no matter their race or gender or ethnicity or sexual orientation or national origin—no matter whether they’re academic or industrial or international. Together, we need to build a welcoming and inclusive physics community.

And how can we do that? Part of the solution, I am convinced, lies in changing our culture. It seems to me that our physics culture is one of the barriers to inclusiveness. We need to challenge our assumptions and to eradicate (inappropriate and unacceptable) behavior.

I was delighted to receive the AIP TEAM-UP report, which addresses many of our cultural issues head-on. Through my role at AAS, where I was Chair of the Physics Section, I made sure the report was featured at the recent AAS Annual Meeting in Seattle.

More recently, I was pleased to hear about the APS Inclusion, Diversity, and Equity Alliance (APS-IDEA) program. I encouraged TRUIME to join because APS-IDEA offers an opportunity for Canadians to learn from their American colleagues, and likewise, for Americans to learn from the Canadian experience. Thank you for including our lab.

I am also pleased to support the APS Delta-Phy (Change Physics) program, which under the leadership of APS President Jim Gates, offers additional hope for changing the culture within our field. We need to look at ourselves in the mirror—our culture and our values—and in the end, addressing our shortcomings will open our doors and make physics relevant for everyone.

Since I’m coming to APS from TRIUMF, I’d like to share our lab’s vision for diversity.

About four years ago, we embarked on a year-long process of community consultation, the end result of which was a set of values to live by. I think they might even apply more generally:

Excellence and Integrity: We have a responsibility to all that we do. We are decisive, bold, courageous and compassionate. We take responsibility for our actions, our commitments, and our contributions to the larger community.

Safety and Accountability: We respect the health and safety of our workers, our visitors, and our neighbors. We build quality into our processes and continue to improve in all of our systems. We embrace transparency and accountability in funding so that we can be held accountable and each other accountable.

Equity and Inclusion: We understand and respect our role within an inclusive work environment, enriching our science and our community. We strive to live up to our values. And open communication to ensure that everyone belongs, and all voices are heard. We respect each other, take care of each other, and support the success of all.

During the pandemic, our values proved helpful as we navigated the uncertainty together. We used them to guide our actions and to hold each other accountable. This past summer, they provided a framework for difficult lab-wide discussions about racism and its manifestations in Canada and abroad.

I am so proud that TRIUMF’s values came from our community, and that and equity and inclusion were held to be as important as safety and accountability—qualities that were heard from the employees of a licensed nuclear facility. APS has values too, and those values must guide interactions between our members and our staff, our students and with each other, and also our behavior as representatives of our community. Together, we can build a welcoming and inclusive physics community.

See also the interview with Jonathan Bagger in Physics Today Online (physicstoday.org/Dec2020).

The APS April Meeting encapsulates the full range of physical scales including astrophysics, particle physics, nuclear physics, and gravitation. This year’s Quarks to Cosmos (Q2C) theme is “Advancing Science in a Global and Inclusive Community.”

Discounted Registration Deadline: February 26, 2021

April 17–20  Online
President Biden announced a new Domestic Workforce: Visa and Immigration: action plan to improve the process for ensuring that international graduate students and professors can stay in the United States to contribute to American science and technology.

Executive Order 13950 put forward by the Biden Administration and others has the potential to make it harder for STEM students and scholars to get visas and stay in the United States. APS is working with the Biden Administration to bring these recommendations to fruition.

APS has a long history of working with the White House and across the executive branch agencies as a credible and reliable resource for policymakers in the energy, health, and climate change ecosystems.

APSAdvance Energy Initiative: The following actions should be taken to reduce the nuclear threat:

1. Sign a five-year extension of the New Strategic Arms Reduction Treaty (New START). Without this extension, the treaty will expire on February 5, 2022, leaving the United States and Russia to negotiate without any nuclear arms limitations treaty or agreement in place for the time in nearly fifty years. A decision by the presidents of the United States and Russia to use sanctions against Russia and potentially China on new and more ambitious arms control arrangements. It also would contribute to the fulfillment of their disarmament obligations and commitments under Article VI of the Treaty on the Nonproliferation of Nuclear Weapons (NPT).

2. Suspend all plans enacted by the previous Administration to prepare and proceed with a nuclear weapons test. The United States' Stockpile Stewardship and Management Plan (the so-called “SNMP”) is the United States’ legal obligation to maintain a nuclear weapons stockpile to meet its national security and nonproliferation needs.

3. Strengthen US leadership in international multilateral efforts to curb nuclear proliferation of nuclear weapons.

• Climate Change: The following actions should be taken to reduce the emissions, and ultimately the concentration, of greenhouse gases:

1. Include robust investments for basic scientific research across the appropriate federal science agencies as a central component to your plans to address climate change.

2. Reverse the previous administration's final rule published on September 24, 2020 titled “Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Greenhouse Gas Sources” and return to the methane regulations established by the prior Administration. Additionally, your administration should begin a process to accurately assess methane emissions as a means to curb emissions of this potent greenhouse gas. This should be undertaken as part of a national policy to achieve or exceed the target set by the Paris Climate Agreement. Reductions of 42 to 52 percent below our 2005 levels by 2035.

Mark Edelson, Interim Director of the APS Office of Government Affairs, said the Society is eager to work with the Biden Administration to bring these recommendations to fruition.

APS has a long history of serving as a credible and reliable resource for policymakers in the White House and across the executive branch agencies. The Society will continue to trend under the Biden Administration and others "to come," he said.

The full text of the letter is available at aps.org/intldoc.

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with Michigan State University to use existing online meeting infrastructure built by the university. With the help of Bravura, the DPF and DAMOP meetings were able to take lessons learned from the virtual 2020 April Meeting and DAMOP to make even better, more user-friendly meeting experiences.

"Every time we hold a meeting, we learn a little more...we’ve added a method of communicating during the poster session. At DAMOP, we added a text chat, and for these meetings, we asked for a video chat for the poster session...What we’re trying to do at the 2023 March Meeting is to make it even better."

Since many APS meeting attendees often rate the networking opportunities among the most valuable components of in-person meetings, online meeting organizers are working on ways to help attendees make connections. Dedicated networking sessions via Zoom were popular at DFP, and new opportunities will be available at the 2023 March Meeting to better emulate the types of in-person interactions that are common while milling about a convention center.

"Two things we’ll be doing for March are having a meeting called "hall networking"—right after a session, people usually go into the hall and continue to talk—people will come out of a session and into their networking room for 10 to 15 minutes to talk about the session," says Clemens. "The other thing we’re going to do is create a networking room for each unit so they can go in and chat, along with some cross-topic networking rooms."

While online meetings still have some limitations, Brown pointed out some ways that the virtual DPF meeting actually benefited from its format. For example, in-person session brought together a relaxed discussion forum environment in physics classes that likely wouldn’t have been able to attend in-person meeting. Brown also noted the increased accessibility of meetings for international attendees and others who might not typically be able to travel. At future virtual meetings, Brown hopes to bring some virtual components in-person sessions to provide even more accessibility for DPF members who can’t travel to the conference.

The virtual DFP meeting also could have applications to an in-person meeting. Rather than attempting to run the usual 40-60 sessions simultaneously, presenters were invited to upload whatever supplemental content they wished alongside their abstracts. Viewers then accessed the additional content—ranging from minute long flash talks to in-depth 15-minute presentations—on their own schedule throughout the meeting. Ongoing chat boxes for each session facilitated a back-and-forth between the speaker and viewer.

People could navigate through the abstracts, browse content or go deep into talks they really wanted to know more about. That went really well, and we had as many as 100 people interested in any given talk, says Jonathan Freund, DFD Meeting Chair and professor at University of Illinois at Urbana-Champaign. "There’s been a lot of talk of this—abstracts plus extra materials—in conjunction with in-person meetings, whatever."

"Each meeting we have new iterations," says Clemens. "The events where we like poster sessions and networking are getting better each time—we just have to keep sharpening up."
Language Matters—Writing Effective Letters of Reference

Heather J. Lewandowski, Mario F. Borunda, Patricia Rankin

Inequality in the representation of ethnic, gender, and racial diversity at all levels in physics is due to several disadvantages marginalized groups face. While increases in diversity are necessary, people in physics also depend on effective and compelling letters of recommendation to be successful. We are concerned that letter writers may be unintentionally写作 weaker letters for students and colleagues belonging to marginalized groups. What is the evidence for this being a problem and what actions can letter writers and readers take to help reduce the bias in an individual's success in physics?

What the data show

The APS Dissertation Awards provide a good example of the underrepresentation of women and minorities in situations that rely on letters of recommendation. From 2015 to 2019, the awardees included 16% women and 2% underrepresented minorities (URM) as compared to 29% of the students who describe themselves as women and 4% of students who described themselves as members of underrepresented racial and ethnic groups. (While APS updated its demographics reporting options in 2019 to allow for non-binary reporting, these data include responses from when non-binary reporting was unavailable.)

We can also see that efforts to combat biases may be paying off when it comes to prizes and fellowships, but we caution that continued efforts are needed. Those selected for fellowships (16% women, 2% URM), prizes (10% women, 2% URM), and awards (17% women, 6% URM) can be compared to 18% of full members that describe themselves as women and 2% as URMs.

Letters do contain bias

Some of the issues we have seen in reviewing letters include the use of communal descriptors (eager, kind, nurturing), terms that are irrelevant to the award (overcame), or statements that offer comparison to others in the field. A comparison to another person may be problematic in several ways. First, is this a fair comparison? Some committees find it useful to designate smaller steps to help better promote our colleagues rather than those of the candidate. Besides specific accomplishments, consider comparing to a person of the same gender, like stressing that a candidate could complete the project even while getting treated for a severe illness. Instead, focus on specific accomplishments (e.g., He was able to develop a new analysis scheme that allowed us to account for many systematic effects in the experiment.) Discuss the impact of your work, not just the results, and how it impacts those of other people in the research group.

We have read many letters where a significant portion details all of a lab mate's contributions rather than those of the candidate. Beyond writing letters

Although these recommendations are aimed at letter writers, readers who are evaluating candidates should also keep them in mind. If you see language or discussions that could invoke a gender, racial, or ethnic bias, you can note these things to (i) consider if they affected your evaluation of the candidate (e.g., you may need to attend to other evaluators so they can also be aware of how this might have impacted their evaluation. These actions may lessen the impact of biased letters. Some committees find it useful to designate one member, in particular, to ensure effective practices are followed.

Overall, taking increased care with letters of recommendation is just one small step to reduce barriers for people from marginalized groups. As we take these immediate smaller steps to better promote our colleagues and students as a community, we must continue to work on eliminating systemic racism and sexism from the field of physics.

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References


