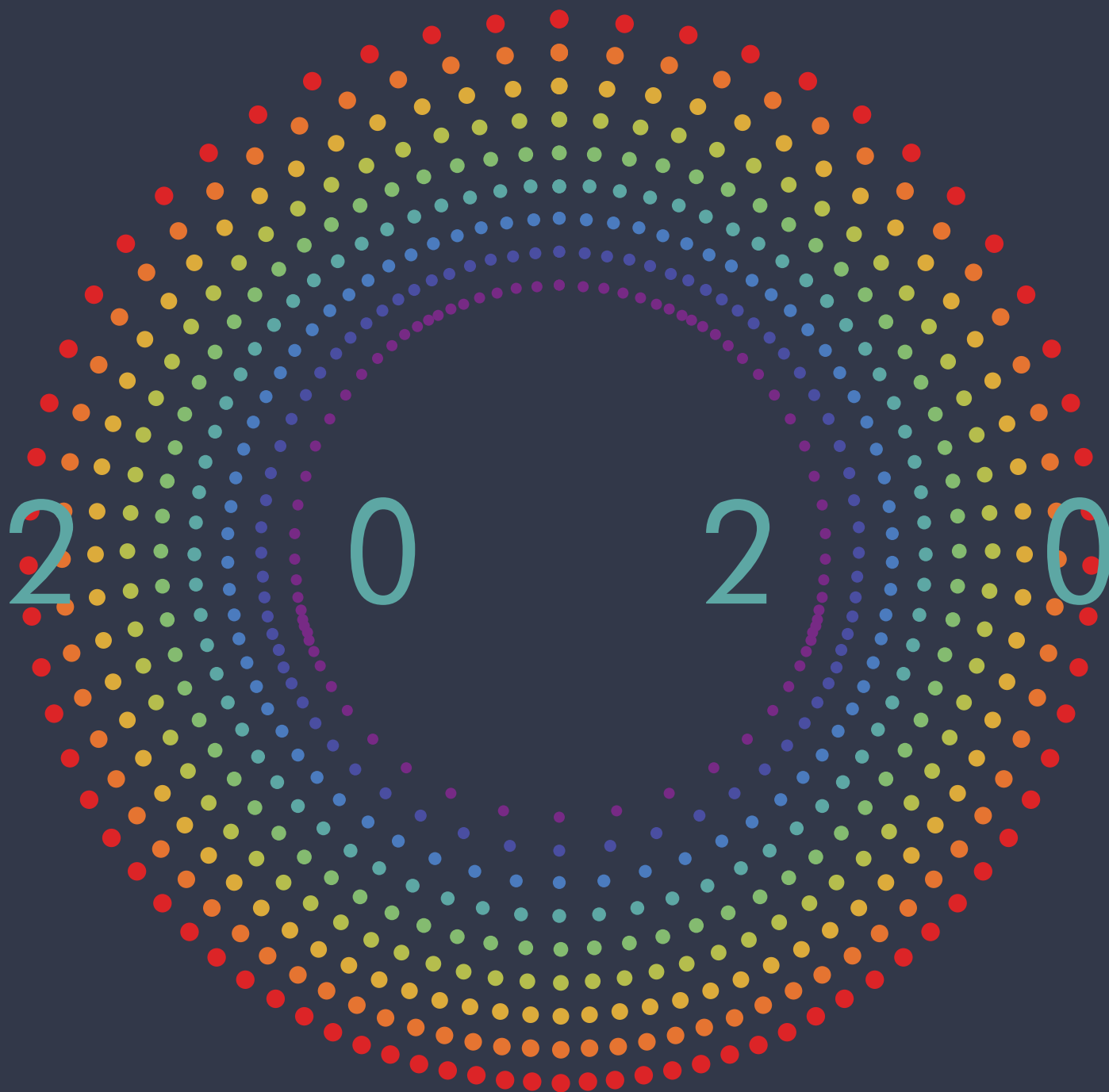
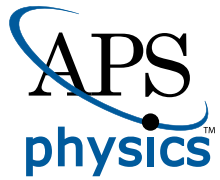


AMERICAN PHYSICAL SOCIETY

A N N U A L



R E P O R T



Cover image from *Geometry of complexity in conformal field theory*  
[Mario Flory and Michal P. Heller, *Phys. Rev. Research* **2**, 043438 (2020)].

# OUR MISSION

To advance and diffuse the knowledge of physics for the benefit of humanity, promote physics, and serve the broader physics community, we

- Provide a welcoming and supportive professional home for an active, engaged, and diverse membership;
- Advance scientific discovery and research dissemination;
- Advocate for physics and physicists, and amplify the voice for science;
- Share the excitement of physics and communicate the essential role physics plays in the modern world; and
- Promote effective physics education for all.



For all of us at APS, 2020 was a year without precedent. From the difficult but critical decision to cancel the March Meeting in Denver to the rapid pivot to organize and host the April Meeting virtually (and subsequently all other APS meetings in 2020), APS staff working with member volunteers explored new ways to serve the physics community during this pandemic year. Personally, I never imagined that I would be spending most of my last year as CEO of APS “zooming” 10 – 12 hours a day from my home in Cambridge, MA.

Although COVID-19 and the effects of social isolation have taken a significant and tragic toll, adversity also created opportunities for change and innovation. APS ensured enhanced access to our physics journals for everyone working from home; APS programs in careers, diversity and inclusion expanded in scope, and by transitioning to a totally virtual environment enabled more outreach and participation; and the Office of Government Affairs together with APS leadership spoke out on policies that harm science and threaten international scientific exchange, while continuing to help members connect with their congressional representatives to advocate on issues affecting the physics community.

It has been both an honor and a pleasure to lead the American Physical Society as its first CEO. I want to express my heartfelt appreciation to APS staff who have worked to carry out our mission with grace and excellence, even during such a challenging year. And I thank all of you, my wonderful colleagues in the physics community, with whom I have been privileged to collaborate. Finally, I wish Jonathan Bagger every success as he takes over as CEO. May APS continue to flourish, as we transition forward to a new “normal” in 2021!

A handwritten signature in black ink that reads "Kate P. Kirby". The signature is fluid and cursive.

KATE P. KIRBY

APS CEO, Emerita





2020 was a stressful year, but the American Physical Society rose to meet the unique challenge of the times. I was fortunate as APS President to work with some dedicated colleagues, including APS Past President David Gross, President-Elect Jim Gates, Vice President Frances Hellman, Council Speaker Andrea Liu, and APS CEO Kate Kirby.

The year started with cautious optimism. We were implementing our Strategic Plan with new programs like APS Chapters. We also wanted to address the erosion in the public's trust in science and in scientists, which grew in part from arrests of prominent scientists for breaches of research security. In February 2020 the APS Board issued its "Statement on Open Science and a Recommitment to Research Principles" to make clear that scientific freedom carries an obligation to adhere to ethical standards.

Everything changed with the COVID-19 pandemic, and the transition didn't take long: We shut down the March Meeting in Denver only hours before its official start, averting a potential health catastrophe. It was the low point of our year, but I took pride in the response of our members and APS staff, who immediately put much of the March Meeting online, thereby spontaneously launching a new kind of research meeting held over the internet.

Although stuck at home for the rest of 2020, APS leadership was busier than ever. In teleconferences, web meetings, and emails to agencies, Congress and the Office of Science and Technology Policy (OSTP), we helped the government assess the harm done to the research community by the pandemic, and we advised on mitigation strategies to keep grad students and postdocs employed and grants running when labs were shut down.

When the government proposed rules that would hurt our community, such as a proposal to cancel visas to international students and postdocs who are vital to our work, we pushed back. We drafted Board Statements and Court Briefs while our Office of Government Affairs helped our members make thousands of Congressional contacts. By working together our voices were heard.

We also took a hard look at the troubling lack of gender, ethnic, and racial diversity in physics. Two new efforts to address this are the webinar series to change physics and the Innovation Fund-sponsored APS-IDEA network.

The resiliency shown by the APS staff was due in part to the leadership of APS's first CEO Kate Kirby, who retired at the end of 2020. Kate oversaw corporate reform at APS and the vigorous growth of our programs. My most important task as President was to ensure a strong replacement. I am pleased to welcome Jonathan Bagger as the new APS CEO, and I know that APS remains in good hands.

As I leave the presidency, I know that APS has much left to do, but I have tremendous confidence in the incoming leadership and in the strength of our community. Thank you to all for your support and for this opportunity to serve as APS President in 2020.

A handwritten signature in black ink that reads "Philip H. Bucksbaum". The signature is written in a cursive, flowing style.

PHILIP H. BUCKSBAUM

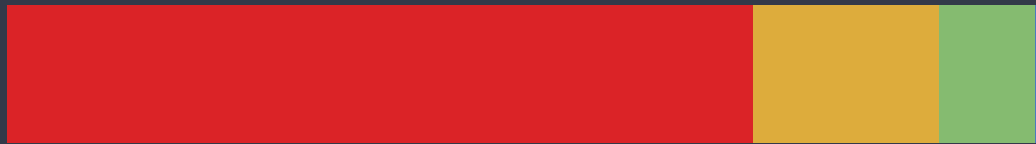
2020 APS President  
Stanford University and  
SLAC National Accelerator Laboratory



# APS MEMBERSHIP IN 2020

## Number of Members

49,555



72.7%  
Male

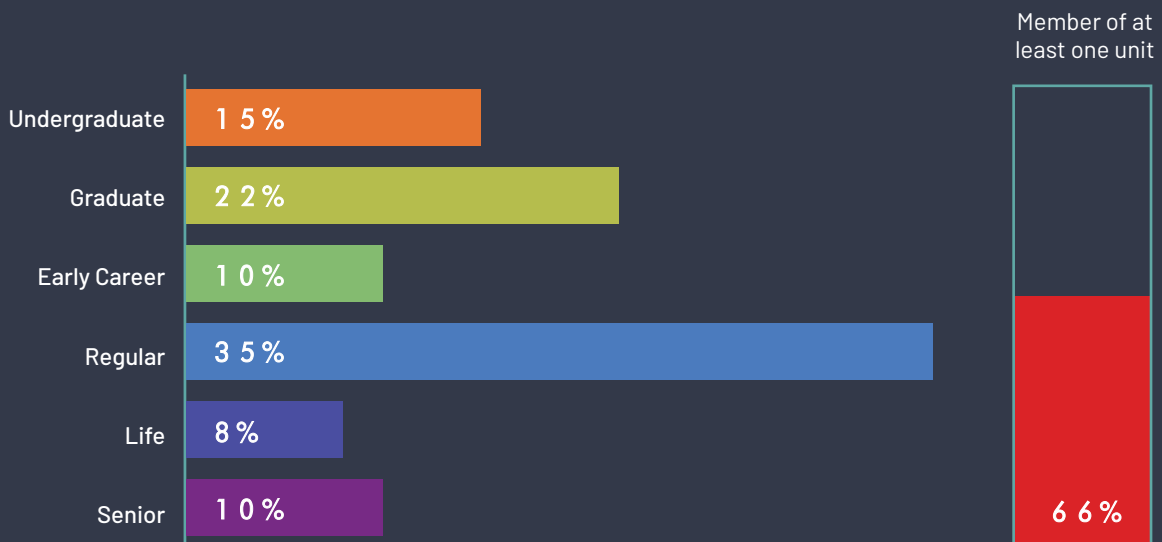
17.3%  
Female

9.4%  
No data

0.3%  
Identity not listed

0.3%  
Non-binary

## Member Type



## Fellows Elected

163

68%  
Male

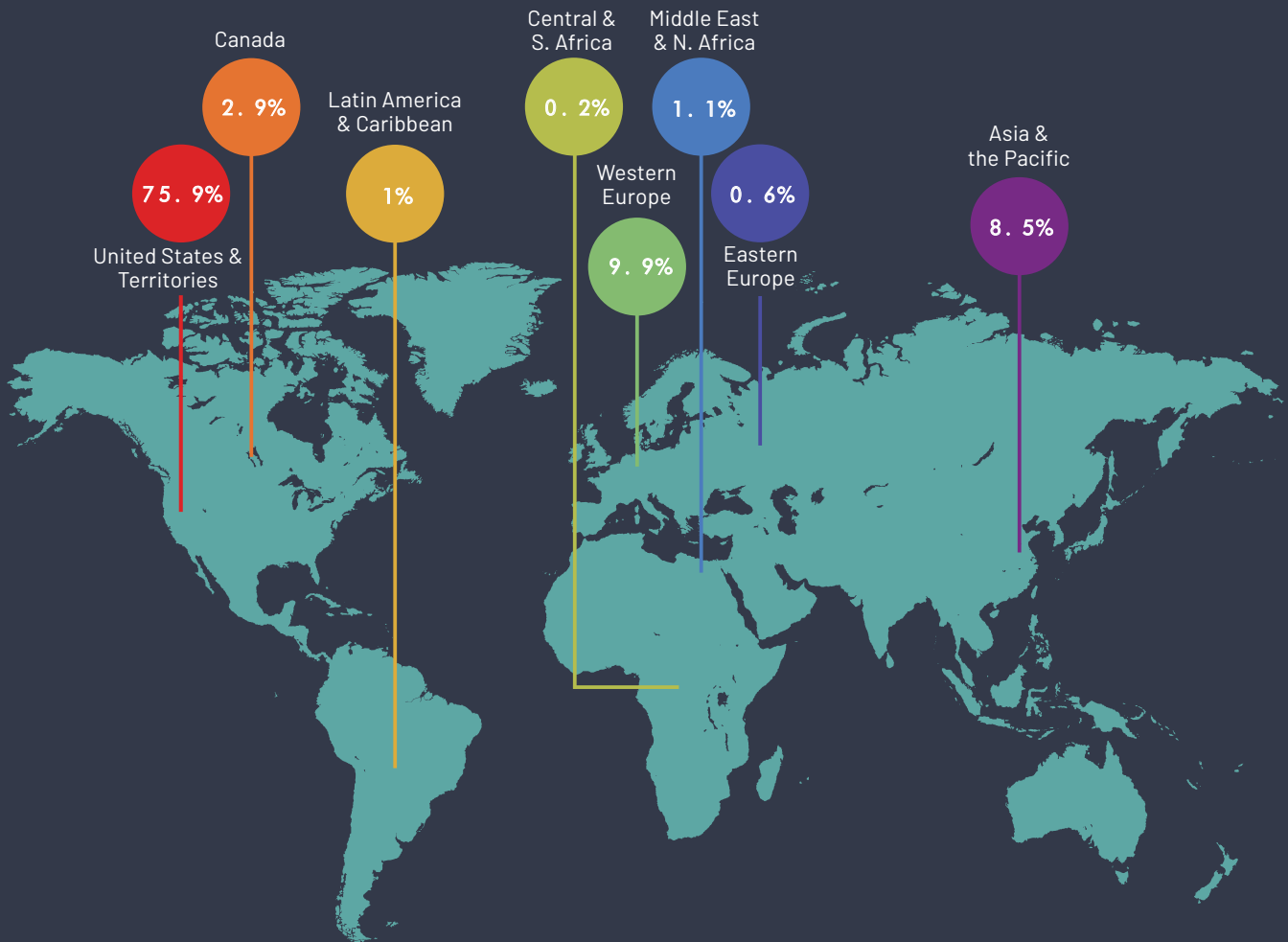
26%  
Female

6%  
No data

26%  
International

## Locations

APS members resided in 107 countries



# PROVIDE

A WELCOMING AND SUPPORTIVE PROFESSIONAL HOME FOR  
AN ACTIVE, ENGAGED, AND DIVERSE MEMBERSHIP

## *Webinars to Change Physics*

In June of 2020, APS President-Elect Sylvester James Gates launched a webinar series to promote the diversity efforts of a coalition of physics organizations including the African American Women in Physics (AAWIP), National Society of Black Physicists (NSBP), American Association of Physics Teachers (AAPT), and American Institute of Physics (AIP). The first webinar, titled “From Passion to Action: Levers and Tools for Making Physics Inclusive and Equitable,” included information about the available tools to support Black physicists. The series continued with a webinar in September on ways to support Historically Black Colleges and Universities (HBCUs), Minority Serving Institutions (MSIs), and Predominantly Black Institutions (PBIs), and another webinar in November on the AIP TEAM-UP Report.



## *APS Inclusion, Diversity, and Equity Alliance*

In 2020, APS created the APS Inclusion, Diversity, and Equity Alliance (APS-IDEA), which is working to transform the culture of physics by supporting physics students, staff, and faculty to advance inclusion, diversity, and equity. The project

has a network of 99 institutional teams with members from around the world. APS-IDEA hosted several workshops to introduce teams to one another and deepen participant knowledge of effective change strategies and cultural change models. Online Learning Communities, groupings of 4-5 teams with similar institutional contexts, were launched in the fall. These communities meet regularly with an assigned facilitator, who guides the teams in their learning processes, assists them with making connections, and provides targeted assistance on challenges they are facing.

## *National Mentoring Community Conference*

The APS National Mentoring Community, in conjunction with the National Society of Black Physicists (NSBP) and the National Society of Hispanic Physicists (NSHP), partnered with the University of Central Florida to host a joint conference in February. The 140 conference attendees included undergraduate and graduate students from underrepresented groups, physics faculty mentors from around the country, scientific professional society representatives, as well as government, public, and private sector employees. The conference included networking opportunities, career workshops, and panels on mentoring best practices.

## *APS Bridge Program*

The APS Bridge Program continued to focus on the goal of increasing the number of underrepresented ethnic and racial groups who complete PhDs in physics. Since its inception, the APS Bridge Program has placed 299 students in graduate programs. Through focused mentoring, early intervention milestones, and dedicated faculty support, the current retention rate for Bridge students is 79%, which is above the national average of 60% for doctoral physics programs.



## *Inclusive Graduate Education Network*

The Inclusive Graduate Education Network (IGEN) expands the successful work of the APS Bridge Program throughout the physical sciences. APS leads a coalition of American professional societies including the American Chemical Society (ACS), American Astronomical Society (AAS), American Geophysical Union (AGU), and Materials Research Society (MRS) in efforts to substantially increase the number of underrepresented minority students that earn doctoral degrees. In December 2020, IGEN launched a new website, creating a place where students can access information on applying to graduate school, partners can find ways to participate in the IGEN program, and individuals and institutions can learn about equity and inclusion in graduate education through a resource library.

## *Conferences for Undergraduate Women in Physics*

The 2020 Conferences for Undergraduate Women in Physics (CUWiP) took place simultaneously at thirteen regional sites across the United States and Canada. Over 1,900 undergraduate women learned about research and career paths, as well as networked with each other and the physics community. The Millie Dresselhaus Keynote address, which was simulcast to all the sites, was presented by Andrea J. Liu.

**>1,900** Undergraduate women  
attended CUWiP

## *APS Chapters*

In 2020, APS launched a new structure to support graduate students, postdocs, and early career professionals as colleagues and future leaders. Chapter members are being empowered to build inclusive, equitable communities within their institutions and will have opportunities to engage in networking, professional skills development, outreach, and policy issues. The first cohort of APS Chapters was established at six universities and two national laboratories. The program kicked off with a virtual workshop for chapter officers in December.

## *New Careers Webinar Series*

In response to the COVID-19 pandemic, APS produced workshops and webinars targeted at students and early career scientists. The Summer Webinar series ran from May through August and included topics such as building your professional path during the pandemic, effective communication using



online tools, careers in science policy, and national laboratory environments. In October, APS launched the Success in Industry Careers series, which focused on skills and knowledge needed to succeed in private sector environments. These two series produced over 35 broadcasts, reached over 2,500 registrants, and received overwhelmingly positive feedback.

## *New Online Resources for International Members*

APS developed the International Engagement Around the World tool, a clickable map that enables physicists worldwide to learn how they can participate in APS programs and how the Society serves their interests. The tool showcases the numerous offerings, advocacy efforts, and honors that the Society provides.

APS added information about employment resources for international members to its website. The pages feature information about employment-based visas and work authorizations in the United States, including H-1B Visas, Green Cards, Optional Practical Training (OPT), and Curricular Practical Training (CPT).



*Opposite page: Speakers at the webinar "Removing Barriers: Physics in HBCU, MSI, and PBI Communities". Above: Participants at the National Mentoring Community Conference, held in February 2020.*

# ADVANCE

SCIENTIFIC DISCOVERY AND RESEARCH  
DISSEMINATION

## A RECORD-SETTING YEAR

15 Peer-reviewed  
journals

>22,000 Articles  
published

>6,100 Open access  
articles  
published

### Continued Commitment to Open Access

#### Open Access Pilots

To better address author, reader, institution, and funder needs APS negotiated open access pilot agreements with Bibsam, the Swedish national consortium (covering 14 institutions), and Max Planck Digital Library (MPDL), which covers the 84 institutions of the Max Planck Society. These pilots allowed authors at those institutions to publish open access articles “hassle-free” — without being invoiced for payment of article publication charges — in all *Physical Review* primary research journals.

#### New Open Access Journal: PRX Quantum

APS launched *PRX Quantum*, a *Physical Review* journal, as a fully open access journal focusing on quantum research and technology with a lasting impact. The journal opened for submissions in the summer and published over 30 papers in 2020. One paper, *Teleportation Systems Toward a Quantum Internet* by Raju Valivarti, *et al.*, was exceptionally received, garnering coverage from over 50 press outlets. *PRX Quantum* was the first *Physical Review* journal title to publish Perspectives, a new article type presenting forward-looking, visionary commentary aimed at a broad audience and showcasing the potential impact of future developments in a research area.

### Physical Review Research Publishes 2,000th Paper

*Physical Review Research* debuted in Summer 2019 and quickly established itself as a sought-after home for open access multidisciplinary research, surpassing 2,000 published papers in its first full year of operation. The success of the journal demonstrates the need to explore new and sustainable models for open access that meet author and reader needs and respond to worldwide mandates.

### Responding to the COVID-19 Pandemic

In order to ensure that researchers and students across the globe were able to continue to access the *Physical Review* journals, APS extended refereeing periods and launched enhanced remote access tools for subscribers. The *Physical Review* journals also took part in initiatives from the White House Office of Science and Technology Policy (OSTP) and the Wellcome Trust to ensure that any COVID-19 relevant research was readily accessible.



Opposite page, top: Participants at the Young Physicists Forum in Brazil.  
Opposite page, bottom: Honorees at the 2020 APS Medal Ceremony:  
Norman Yao, Myriam P. Sarachik, and Joel R. Primack.



### APS Meetings

On February 29, APS canceled the 2020 March Meeting due to the COVID-19 pandemic. While it was a difficult decision, the cancellation prevented the meeting from becoming a potential super-spreader event. After the cancellation, APS member volunteers immediately recreated many components of the March Meeting in virtual settings. Inspired by these quick moves to a digital format, APS shifted to planning and creating a virtual April Meeting. The April Meeting featured the Kavli Foundation Keynote Plenary “Exploring the Cosmos” with presentations by Nobel laureates James Peebles, Michel Mayor, and Eric Cornell. The event also included a public lecture by Sheperd S. Doeleman, as well as a showing of the award-winning documentary *LIGO* and a discussion afterwards with Executive Director of the LIGO Laboratory David Reitze and filmmaker Les Guthman. APS held 13 other virtual meetings throughout 2020, including the annual meetings of DAMOP, GEC, DPP, DNP and DFD, with each achieving record attendance. APS Meetings collectively featured 20,567 scientific presentations in 2020.

### Chronicling the Transition to Virtual Meetings

Science news outlets, including *Science*, *Nature*, and *Physics World*, watched closely as APS quickly pivoted to its first fully virtual April Meeting. APS staff arranged numerous interviews

between APS leadership and reporters at these outlets to facilitate positive media coverage of the transition to virtual meetings. The resulting news articles portrayed APS as an innovative organization well-equipped to adapt to challenging circumstances and continue to meet its members’ needs.

### Young Physicists Forum

In March, participants from four continents gathered in Brazil for the Young Physicists Forum on Biological Physics: from Molecular to Macroscopic Scale. This conference brought together graduate students for science-focused sessions, as well as career development training and networking opportunities. The Forum was jointly organized by APS, Sociedade Brasileira de Física (SBF), and the International Centre for Theoretical Physics-South American Institute of Fundamental Research (ICTP-SAIFR).

### APS Honors

The 2020 APS Medal for Exceptional Achievement in Research was presented to Myriam P. Sarachik for fundamental contributions to the physics of electronic transport in solids and molecular magnetism. The Award Ceremony, held annually in Washington, DC, was expanded to include two additional society prizes, the Julius Edgar Lilienfeld Prize and the George E. Valley, Jr. Prize. The 2020 prizes were awarded to Joel R. Primack and Norman Yao, respectively. APS bestowed an additional 60 prizes and awards to outstanding members of the physics community.



# ADVOCATE

FOR PHYSICS AND PHYSICISTS, AND AMPLIFY  
THE VOICE FOR SCIENCE

## *Congressional Visits Day*

During the annual APS Congressional Visits Day, nearly 70 APS members advocated for the Society's science policy priorities on Capitol Hill. Representing 26 states across the country, groups of these volunteers participated in nearly 100 meetings to make the case for the science policy priorities determined by APS members and leadership. During the meetings, APS volunteers requested that members of Congress co-sponsor the Combating Sexual Harassment in Science Act; cosponsor the Keep STEM Talent Act; preserve methane emissions regulations on the oil and gas industry; introduce legislation to keep the Federal Helium Reserve open and create a robust helium recycling program; and include funding increases of at least four percent real growth for key science agencies during the Fiscal Year 2021 appropriations process.

## *Presidential Letter to Congress*

2020 APS President Philip H. Bucksbaum wrote to the House Committee on Science, Space and Technology outlining policy initiatives that would help the physics community overcome challenges created by the COVID-19 pandemic. He asked Congress to take several steps to help restore research after laboratories reopen, including to provide partial- and full-grant cost extensions, provide ramp-up funding to restart laboratories, and enhance domestic STEM scholarships. Nearly 1,000 APS members participated in a grassroots campaign to encourage their legislators to follow the recommendations laid out in the letter. Legislation quickly emerged in Congress that advanced the recommendations.

## *APS Amicus Brief*

In July, U.S. Immigration and Customs Enforcement (ICE) announced a rule change that would have forced international students currently in the United States to return to their home countries or switch to an institution planning to offer in-person instruction. Harvard University and MIT filed a lawsuit challenging the rule, and APS drafted an amicus brief to support their case. APS encouraged other science societies to participate and 16 signed the amicus brief. ICE rescinded the directive.



*Left: Andrea J. Liu, Petra Rudolf, and Peter Knight spoke at the Plenary Panel on International Competition at the 2020 APS Annual Leadership Meeting. Opposite page: Almost 70 APS members from 26 states visited Capitol Hill during the 2020 APS Congressional Visits Day.*

## RECORD YEAR GRASSROOTS ADVOCACY BY APS MEMBERS

> 18,000

Op-Eds, emails to Congress, public comments, social media posts, phone calls, and visits to Congressional offices

### *Making the Case for Helium*

APS continued to advocate on helium issues, as academic researchers experienced unsustainable price increases and unreliable delivery. Leaders from DCMP, DMP, DAMOP, and DQI urged Congress to ensure that federal users, including researchers supported by federal grants, maintain access to the helium marked for federal use that remains in the Federal Helium Reserve after the General Services Administration completes its disposal process. APS organized a meeting between APS members and US Representative Joe Neguse (D-CO-2nd) to discuss helium. After the meeting, Neguse indicated that he would take the lead on legislation that would require the in-kind helium program to continue under any company that purchases the Federal Helium Reserve. In December, Neguse introduced the “Securing Helium for Science Act of 2020.”

### *Brief Policy Reports*

APS began developing brief policy reports. These new reports are intended to be more nimble than standard APS study reports and will be written about timely issues. The first report, *How International Students and Researchers Benefit the United States: Their Experiences, Their Stories*, was used to highlight the importance of the Optional Practical Training (OPT) and J-1 Visa programs through stories about talented international students and scholars who chose to study and work in the United States. The report also provided context for policy discussions on how to restore the United States as a destination for the best and brightest in the world.

### *International Roundtables*

In response to the COVID-19 pandemic, APS facilitated a virtual roundtable in June to address the impact of the pandemic on the global physics community. The roundtable drew on the expertise of physics leaders from Europe, Africa, Asia, North America, and South America. The group considered possible solutions facing the scientific community during this time and discussed common and unique concerns.

APS also organized the US-China Physics Roundtable, which brings together leaders from both nations to discuss opportunities for, and challenges to, bilateral physics cooperation. Attended by the APS Presidential Line and distinguished scientists from both the United States and China, including Nobel laureates, these ongoing meetings encourage collaboration between the two nations’ research communities for the advancement of science and technology and the reduction of barriers to cooperation.

### *APS Wiki Scientist Course*

As part of APS’s continued efforts to elevate the visibility of underrepresented physicists on Wikipedia, APS offered a training course in partnership with Wiki Education. The course focused on creating and expanding biographies of minority and women physicists. Wiki Education’s Wikipedia experts guided course participants through the process of adding their knowledge to Wikipedia.



# SHARE

THE EXCITEMENT OF PHYSICS AND COMMUNICATE THE  
ESSENTIAL ROLE PHYSICS PLAYS IN THE MODERN WORLD

## *Annual Leadership Meeting*

In early 2020, APS hosted the inaugural Annual Leadership Meeting to highlight forefront physics, promote international engagement, and provide training and networking opportunities for APS unit leaders. The panel discussions ranged from international collaborations such as LIGO, to the international competition in growing areas such as quantum information science. The meeting also featured talks by two former Secretaries of Energy, Ernest Moniz and Steven Chu. In conjunction with the meeting, APS also hosted the International Leadership Forum, in which physicists from around the world spoke about the challenges and opportunities faced by the physics community.

## *Innovation Fund*

The APS Innovation Fund (IF) continued to provide grants to support entrepreneurial projects that advance the interests of the physics community and align with the APS Strategic Plan. In addition to the annual call for proposals, the IF held a second, special call to respond to critical needs of the physics community resulting from the COVID-19 pandemic. Between the two funding rounds, APS awarded grants to six projects that support a variety of efforts, including: probing graduate admissions practices that maintain excellence and diversity in the face of COVID-19; translating high school physics classroom materials into Spanish to be used throughout Latin America during the pandemic and beyond; enabling leadership institutes that support using the Effective Practices for Physics Programs (EP3) Guide in implementing transformational change; supporting graduate and professional-level women and allies in STEM in eastern Africa, while providing outreach to elementary and secondary level students; and preparing the future quantum information workforce focusing on diverse undergraduate populations.

6 Innovation Fund grants awarded

## *African Physics Newsletter*

APS continued to publish the African Physics Newsletter, a quarterly newsletter launched in 2019, written by and for the African physics community. With the COVID-19 pandemic shuttering in-person communications in 2020, the newsletter became an important vehicle for sharing the experiences of African physicists and students. In addition to personal accounts, the newsletter also featured articles about the impact that physicists and research in physics had on the effort to combat the spread of the COVID-19 pandemic.



### *Communicating Physics through the Media*

APS helps keep the general public informed about research in physics by sharing its journal articles and scientific meeting content with newspapers, magazines, and online publications. APS alerted journalists to new research published in the *Physical Review* journals via a weekly “tip sheet” distributed to more than 300 science reporters. Each tip sheet summarized three to five journal articles published that week and provided copies of those papers to the media. APS also alerted public information officers at universities, national laboratories, and other research institutions when their scientists had a paper accepted to a *Physical Review* journal.

APS handled media relations for a growing number of APS meetings, including the March and April Meetings, as well as the annual meetings of DPP and DFD. In addition to encouraging journalists to attend the meetings, the APS Press Office also highlighted newsworthy research being presented and hosted press conferences to connect researchers with reporters.

### *APS Physics Accelerator*

In 2020, APS introduced the APS Physics Accelerator to provide information to physics students about industry careers and to provide instructional materials to promote success in their industrial careers. The Accelerator consolidates APS industry career resources into one program and plans to expand the offerings.

### *APS Careers 2020 Guide*

APS produced the APS *Careers 2020* guide in partnership with the Institute of Physics’ *Physics World* magazine. *Careers 2020* is primarily targeted towards students and early career physicists. The guide includes career advice, profiles of physicists working in diverse fields, a special section devoted to entrepreneurship using physics, and a directory of employers who are seeking new hires.

### *Career Mentoring Fellows*

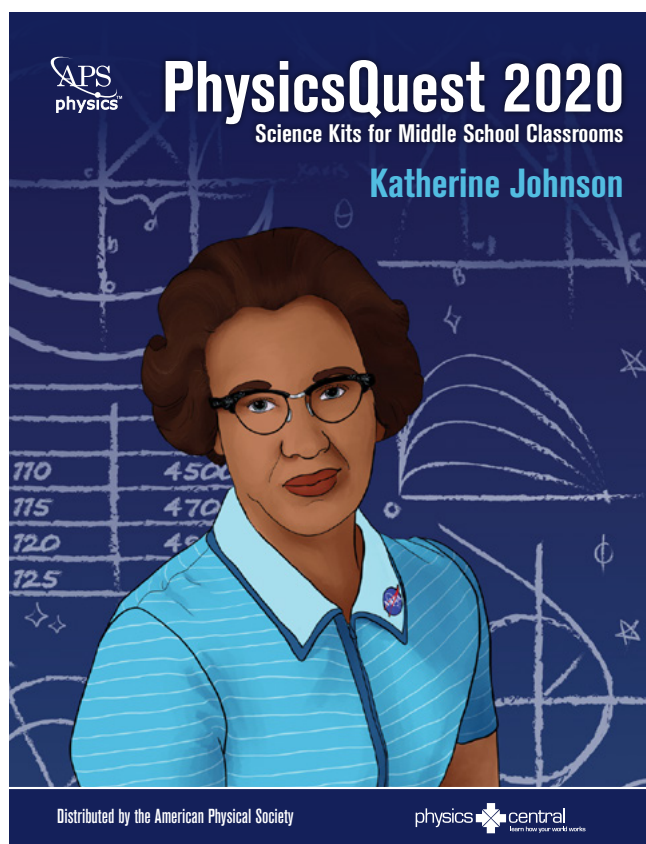
APS started the Careers Mentoring Fellows program with an inaugural cohort of 24 Fellows. The Fellows were selected based on their mentoring experience, volunteer roles, interest in physics careers, and diversity, equity, and inclusion statements. The program provided career mentorship training to volunteers so that they can be more effective at advising physics students about career options. The Fellows’ activities included giving career talks at physics departments and offering feedback on undergraduate student presentations at the APS April Meeting.

### *Expanding IMPact*

APS expanded the Industry Mentoring Program (IMPact) to include international students and mentors. Many early career physicists and students have limited exposure to industry during their academic years. Integrating the international community into IMPact will increase students’ exposure to these career options and bring in mentors from outside of the United States. Mentors and employers benefit from a global pool of young physics talent.

### *PhysicsQuest*

PhysicsQuest kits introduce middle school students to the basic concepts of physics through fun experiments. The 2020 quest used the incredible life and work of NASA’s Katherine Johnson to frame four activities based on force and motion. Students learned the physics of falling, swinging, flinging, and the basics of orbital motion that Katherine Johnson used to help put the first Americans in space.



•••••  
Above: Cover of the 2020 PhysicsQuest kit featuring Katherine Johnson. Opposite page: Steven Chu spoke at the 2020 APS Annual Leadership Meeting.

# P R O M O T E

E F F E C T I V E P H Y S I C S E D U C A T I O N F O R A L L



## *Physics Teacher Education Coalition*

The Physics Teacher Education Coalition (PhysTEC) is a partnership of APS and the American Association of Physics Teachers (AAPT) to provide funding and programs for the training and support of high school physics teachers. US colleges and universities receiving support from PhysTEC have graduated an average of 82% additional physics teachers than they would have without support. Over the past 20 years, more than 800 physics teachers prepared with PhysTEC support have taught more than 350,000 high school students.

PhysTEC awarded contracts to Stony Brook University and Texas A&M University-Commerce to establish Regional

Networks of institutions and faculty who are leading physics teacher education programs. The Regional Networks program is designed to dramatically increase PhysTEC's reach by building networks with the reputation and capacity for supporting teachers and teacher preparation. The New York and Texas Networks, together with PhysTEC's first Regional Network in California, engage institutions in best practices for improving their teacher preparation programs.

## *Effective Practices for Physics Programs (EP3)*

Responding to numerous requests from college and university undergraduate physics departments to consider how standards impact undergraduate physics, APS, in cooperation with the American

Association of Physics Teachers (AAPT), has been developing a comprehensive guide to effective practices for use by physics departments across the country. Charged with this task in 2015, this year saw development continue on the 30+ chapters of the guide, which is being released throughout 2021. Initial chapters of the guide include recruitment, retention, career preparation, advice to chairs, program review, and advising and mentoring.

EP3 also received funding from NSF in 2020 to conduct site visits to eight Historically Black Colleges and Universities (HBCUs) departments. In 2021, site visit teams will focus on providing support for increasing the number of African American students receiving physics bachelor's degrees.



## *Toolkit for Departments under Threat*

The COVID-19 pandemic exacerbated economic concerns at many colleges and universities, and several physics departments were threatened with closure or significant restructuring. APS responded to these reports by developing a toolkit to help departments think and act strategically, as well as prepare to face budgetary or programmatic shifts that could imperil their mission.

## *STEP UP*

The STEP UP program is a community of physics teachers, researchers, and professional societies that designs lessons to empower high school teachers, create cultural change, and inspire young women to pursue physics in college. The challenges of the COVID-19 pandemic brought the need to support the STEP UP community of teachers who moved to virtual learning environments. STEP UP held 25 “Social Hours” for the community to gather via Zoom (including five with Nobel laureates and two virtual laboratory tours), which were attended by hundreds of teachers. New lesson plans on *Careers in Physics* and *Women in Physics* were rolled out with recommendations for remote implementation, and a virtual summit for 100 Ambassador-teachers was held via Zoom. The Ambassadors ran 180 training events for high school physics teachers and recruited an additional 420 to the project. This led to an expanded community of supporters that includes more than 1,100 high school physics teachers across all 50 states and around the world.

**4 2 0** New high school teachers joined the STEP UP community

APS piloted the inclusion of international Ambassadors in the STEP UP program. There were two international Ambassadors in the 2020-2021 cohort, one in Canada and another in Brazil. The work of these Ambassadors will help inform the STEP UP program administrators on how to tailor the messaging and classroom materials in communities abroad.



*Opposite page: Participants in the National Mentoring Community Conference, held in February 2020. Above: Dr. Desiré Whitmore was profiled on #WomenInPhysicsWomen.*



## *Physics Department Chairs Conference*

A record number of physics department chairs attended the conference to discuss topics focusing on how colleges and universities were responding to the COVID-19 pandemic. Content was tailored for both new and existing chairs, with participants having opportunities to share strategies, relate best practices, and have organic discussions about current concerns and opportunities facing physics departments. The conference was co-hosted by APS and the American Association of Physics Teachers (AAPT).

## *Physics and Astronomy New Faculty Workshop*

The Physics and Astronomy New Faculty Workshop facilitated a robust exchange of ideas for faculty members and soon-to-be faculty members with one another and with leading innovators in physics and astronomy education. The October virtual gathering brought together a record attendance of faculty, instructors, and postdocs to focus on physics and astronomy teaching methods and to forge new professional friendships. Special emphasis was placed on teaching in the virtual environment and sharing ideas on how to effectively engage students during the COVID-19 pandemic. The workshop was sponsored by APS, the American Association of Physics Teachers (AAPT), and the American Astronomical Society (AAS).

*APS gratefully acknowledges the National Science Foundation for its support of these projects.*

# FINANCES

DECEMBER 31, 2020

APS was forced to adjust during fiscal year 2020, like most organizations. In spite of operating under very different business circumstances, the organization ended the year with reduced revenues but also significantly reduced expenses. The Total Net Assets of the American Physical Society increased from \$247.7M to \$271.7M, due largely to a strong return on investments.

Net Assets without Donor Restrictions are composed of \$174.1M of undesignated assets and \$48.4M of board designated assets. Net Assets with Donor Restrictions increased from \$17.9M at the end of 2019 to \$18.4M at the end of 2020.

APS recognized \$56.7M of operating income and incurred operating expenses of \$56.6M resulting in net income from operations of \$100k. Due to shifting business operations during the pandemic, APS personnel and benefits represented 62% of total operating expenses. Non-operating income increased \$28.6M as a result of investment income and changes in the value of APS's investment in the American Center for Physics and its post-retirement health liability. The total change in Net Assets during 2020 was \$28.7M.

December 31, 2019 and 2020 (in Millions)

## STATEMENT OF FINANCIAL POSITION

	2019		2020
<i>Assets</i>			
Cash & Cash Equivalents	\$ 25.4	\$	23.7
Investments, at Fair Value	197.1		221.1
Accounts Receivable	1.8		2.6
Pledges Receivable	0.1		0.0
Prepaid Expenses	1.4		2.3
Equity Interest in American Center for Physics	4.4		5.0
Land, Building and Equipment	17.0		16.2
Interest in Beneficial Trust	0.6		0.7
<b>TOTAL ASSETS</b>	<b>\$ 247.7</b>	<b>\$</b>	<b>271.6</b>
<i>Liabilities and Net Assets</i>			
<b>Liabilities</b>			
Accounts Payable	\$ 5.4	\$	6.4
Publications	12.5		11.5
Membership Dues	2.7		2.6
Other	0.7		0.1
Post-Retirement Benefits	14.2		10.2
<b>TOTAL LIABILITIES</b>	<b>35.5</b>		<b>30.7</b>
<b>Net Assets</b>			
Undesignated	146.8		174.1
Designated by Board	47.4		48.4
<b>Net Assets Without Donor Restrictions</b>	<b>194.3</b>		<b>222.5</b>
Perpetual by Nature	5.0		5.3
Purpose Restrictions	12.9		13.1
<b>Net Assets With Donor Restrictions</b>	<b>17.9</b>		<b>18.4</b>
<b>TOTAL NET ASSETS</b>	<b>212.2</b>		<b>240.9</b>
<b>TOTAL LIABILITIES AND NET ASSETS</b>	<b>\$ 247.7</b>	<b>\$</b>	<b>271.6</b>

## STATEMENT OF ACTIVITIES

	2019		2020
<i>Net Assets</i>			
<b>Net Assets Without Donor Restrictions</b>			
Operating Activities			
Operating Revenues	\$ 62.7	\$	56.7
Operating Expenses	60.3		56.5
<b>Income from Operations</b>	<b>2.4</b>		<b>0.1</b>
Non-operating activities			
Income from investments	32.1		23.2
Other non-operating income	(2.2)		5.0
<b>Income from Non-Operating Activities</b>	<b>29.9</b>		<b>28.1</b>
<b>TOTAL CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS</b>	<b>32.3</b>		<b>28.3</b>
<b>TOTAL CHANGE IN NET ASSETS WITH DONOR RESTRICTIONS</b>	<b>0.8</b>		<b>0.5</b>
<b>TOTAL CHANGE IN NET ASSETS</b>	<b>\$ 33.1</b>	<b>\$</b>	<b>28.7</b>



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\* Voting Members of the APS Board of Directors

## OUR VISION

**To excel as a leading physics society, we will**

- Be the authoritative advocate for physics;
- Publish world-leading journals in physics and related sciences;
- Convene vital meetings, conferences, and workshops;
- Engage and support the next generation of physicists;
- Foster equity and inclusion, and increase diversity in all its dimensions;
- Expand public appreciation of physics and its many contributions.

## OUR VALUES

**The core values that drive our mission are:**

### **THE SCIENTIFIC METHOD**

We believe that the success and credibility of physics come from systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses leading to the development of theory.

### **TRUTH AND INTEGRITY**

The welfare of physics and the physics community requires that we act honestly, ethically, and with professional integrity in the conduct and reporting of physics.

### **DIVERSITY, INCLUSION, AND RESPECT**

Diversity in all its dimensions is an asset to physics and we are committed to full and respectful participation by everyone.

### **PARTNERING, COOPERATION, AND OPEN COLLABORATION**

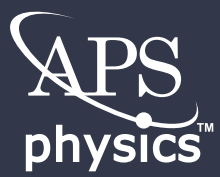
As physics benefits from being a global endeavor, we seek to create the conditions for free and open scientific exchange across national boundaries and political and ideological divides.

### **SPEAKING OUT**

Recognizing that good science benefits society, we speak out on issues where scientific evidence and expertise can inform the debate.

### **EDUCATION AND LEARNING**

The practice of physics involves lifelong learning and rigorous scholarship; we are committed to providing a community that values education at all levels and promotes open scientific discourse.



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