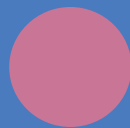
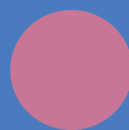
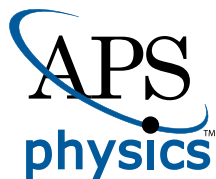


AMERICAN PHYSICAL SOCIETY

Annual Report

2021





Page 8 image from: *Information scrambling versus decoherence* [Akram Touil and Sebastian Deffner, *PRX Quantum* **2**, 010306 (2021)].
Page 10 image from: *Experimentally bounding deviations from quantum theory in the landscape of generalized probabilistic theories* [Michael D. Mazurek, Matthew F. Pusey, Kevin J. Resch, and Robert W. Spekkens, *PRX Quantum* **2**, 020302 (2021)]. Page 12 image from: *Swing-up of quantum emitter population using detuned pulses* [Thomas K. Bracht, Michael Cosacchi, Tim Seidelmann, Moritz Cygorek, Alexei Vagov, V. Martin Axt, Tobias Heindel, and Doris E. Reiter, *PRX Quantum* **2**, 040354 (2021)]. Page 14 image from: *Decoder for the triangular color code by matching on a Möbius strip* [Kaavya Sahay and Benjamin J. Brown, *PRX Quantum* **3**, 010310 (2022)]. Page 16 image from: *Fibonacci anyons versus majorana fermions*, [Emil Génétay Johansen and Tapio Simula, *PRX Quantum* **2**, 010334 (2021)].

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.





During my first year serving as APS CEO, I have been impressed by the dedication of the APS members, staff, and community, to the Society and our mission. I am grateful for the support, insight, and feedback I have received as we strive to make APS even better. I am proud of the strength and resiliency with which APS has faced the challenges of the past year: We continued to operate a successful member organization through the pandemic, even while redoubling our commitment to our 2019 Strategic Plan and serving the physics community.

Toward this end, in 2021 APS expanded its journal portfolio by launching a new open access journal—*PRX Quantum*—that is well on its way to success.

A second new open access journal—*PRX Energy*—has just opened for submissions. These journals respond to calls from our community and reflect the growth and diversification of our field.

Throughout the year, we heard from many members who greatly missed meeting in person. We worked with public health experts to host two successful in-person unit meetings during the fall. Hybrid technologies made the meetings accessible to those for whom travel was difficult or impossible, while strict COVID guidelines kept them safe for in-person attendees. APS will keep working with our members to improve the hybrid experience for all our meeting participants.

Over the course of the year, APS continued transitioning to “remote first” operations. This change allows us to draw upon a global pool of talent to staff and manage our programs. The transition has decreased the Society’s need for office space, so APS sold its Ridge, New York facility and is now reducing its footprint in College Park, Maryland. We have leased a smaller space on Long Island, in Hauppauge, New York, to complement our presence in College Park and Washington, DC.

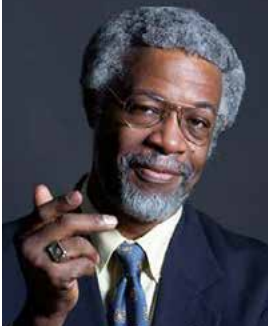
After serving as CEO for one year, my aspirations for APS are clear. In five years, in alignment with the Strategic Plan, APS should fully embrace the global physics community. Wherever physicists are and whatever they are doing, APS should be alongside them, offering a welcoming home and providing the help they need to thrive in their chosen profession. This is a bold and expansive vision; I look forward to working with you to make it a reality.

I am grateful to my predecessor, Kate Kirby, and the 2021 APS President, Jim Gates, for welcoming me into my role as CEO of this terrific organization. I would also like to thank you for the time and resources you dedicate to APS activities. Your support is critical to our shared success.

A handwritten signature in black ink that reads "Jonathan A. Bagger". The signature is fluid and cursive, with the first name being the most prominent.

JONATHAN A. BAGGER

APS Chief Executive Officer



I started my APS Presidential year by stating: For an individual, it has been said that character is destiny. For an organization, perhaps it can be said that culture is destiny. Culture and values are tightly linked. Commitment to living the APS Values has guided me, and the organization, through a challenging 2021.

Long ago, I concluded the APS is the vessel in which the culture of the disciplines is forged. In order to facilitate cultural transformation, I launched the DELTA PHY initiative. DELTA PHY activities are a designated “APS Commons” and a lever for the Society-wide conscious initiation and management of its culture and its transformational culture change. On two critical issues—research security and the treatment of scientists of Asian descent—DELTA PHY allowed the APS to share with members what APS stands for; what APS is doing on their behalf; and gather feedback directly from the community.

I’ve always had confidence in the strength of our organization, but never more so than now. As President of APS in 2021, I enjoyed a unique vantage point: to see the breadth of services the APS provides our community, to envision what APS could be in the future, and strategically map out foundational steps to secure APS’s path forward for generations to come—all with the help, wisdom, and consultation of my colleagues.

One of the most pleasant experiences of the year was to welcome the new APS CEO, Jonathan Bagger, into a leadership capacity and to work closely with him as he ‘got his sea-legs under him’ to guide the Society. Jon and I have known each other for over forty years, and it was very rewarding to be his partner during this time.

Our dues only support a tiny fraction of APS’s numerous programs and activities, such as DELTA PHY. I encourage you to join me and the entire APS Board of Directors in contributing financially to the Society, as you are able.

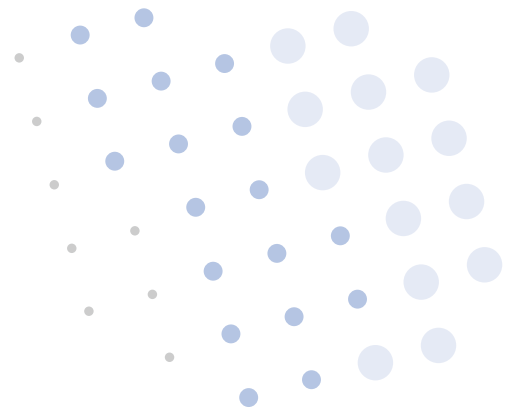
In closing, I would like to thank the cohort of individuals with whom I’ve worked during the past three years as a member of the APS Presidential Line. These are people from whom I’ve learned, leaned on, been advised by, and I am very proud to call these colleagues, but, most of all, proud to call them friends. These include David Gross, Phil Bucksbaum, Frances Hellman, Bob Rosner, and Young-Kee Kim. And I’m thrilled to pass the APS torch into the capable hands of 2022 APS President Frances Hellman.

Sylvester J. Gates, Jr.

SYLVESTER JAMES GATES, JR.

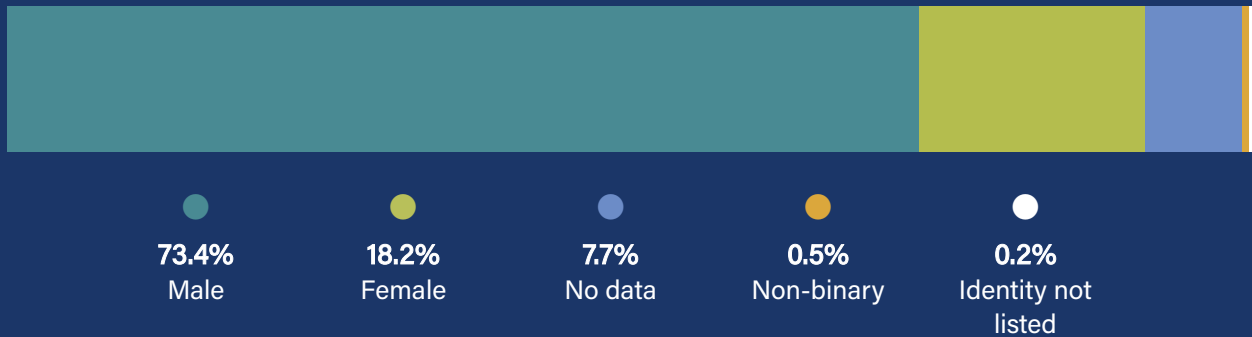
2021 APS President
Brown Theoretical Physics Center
Brown University (*through June 2022*)

University of Maryland (*beginning July 2022*)

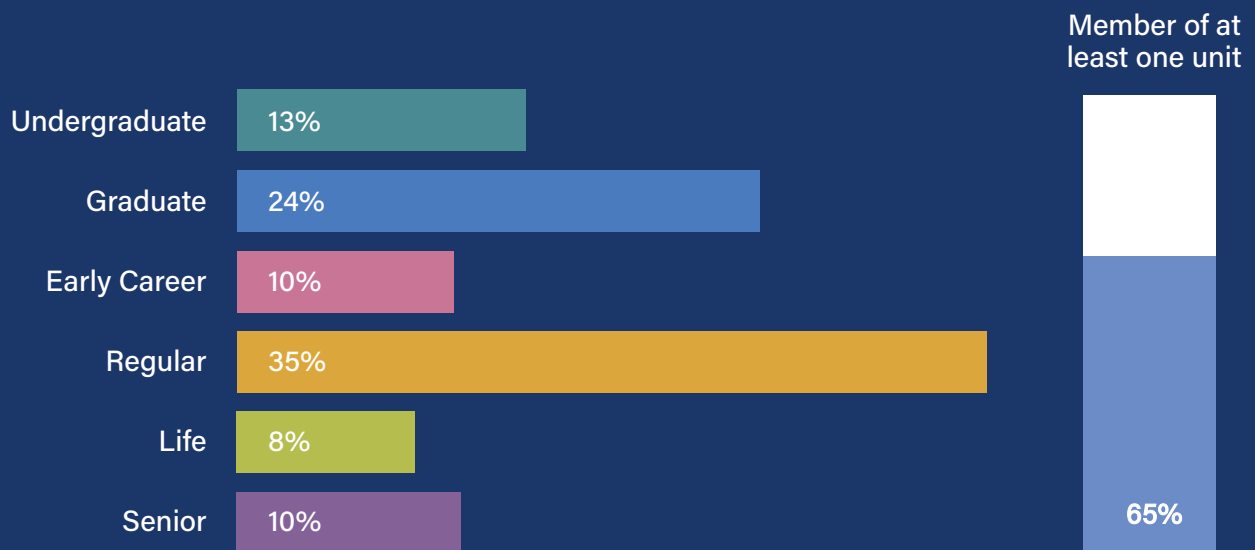


Number of Members

49,446



Membership Type



Fellows Elected

155



72%
Male



25%
Female



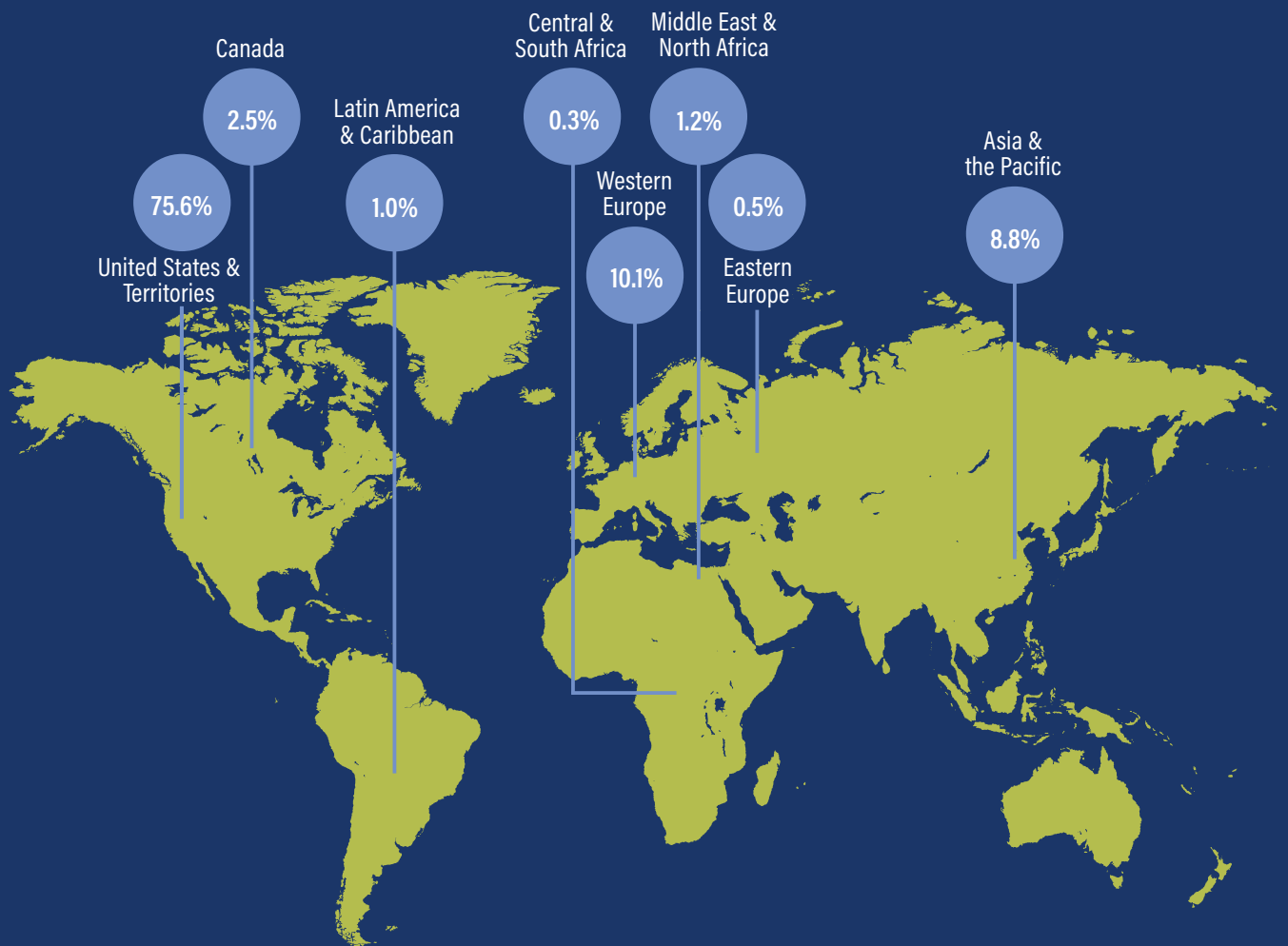
3%
No data



28%
International

Locations

APS members resided in 118 countries



Provide
a welcoming
and supportive
professional home
for an active,
engaged, and
diverse membership

2,300

DELTA PHY
webinar viewers

1,240

Registered job seekers
at APS career fairs

~600

Jobs advertised
at APS career fairs

400

Members of
APS Chapters

Author Name Change Policy

APS implemented a policy that allows authors to alter or update their published names and/or personal pronouns on papers published in *Physical Review* journals dating back to 2000. This ensures that authors retain ownership of any prior works published under a different name. The inclusive policy was designed to address the needs of transgender researchers, but name changes can be made for any reason. In addition, APS has partnered with 17 US national laboratories to facilitate name change requests from the institutions on behalf of their scientists.

DELTA PHY Webinars to Change the Physics Culture

Led by 2021 APS President Sylvester James Gates, Jr., the APS DELTA PHY webinar series on changing the culture of physics continued to promote diversity. The webinars addressed issues such as supporting the academic success of Black students, the impact of research security policies on Chinese physicists, and the effectiveness of US federal immigration policy. Each webinar reached hundreds of viewers.

Ethics

In 2021, the APS Ethics Committee established working groups on research integrity and ethics education. The Committee proposed revisions to the APS Guidelines on Ethics in the areas of enabling misconduct, code of conduct for meetings, and conflicts of interest and commitment. The revisions were sent to the APS Panel on Public Affairs for consideration.

Analysis of the Society's 2020 ethics surveys of early-career members and department chairs was completed in 2021; the results will be disseminated in *Physics Today*. In 2021, APS also began requiring professional conduct disclosures from members running for leadership positions, nominated for honors, or appointed to committees.

Conference for Undergraduate Women in Physics (CUWiP)

The 2021 APS Conference for Undergraduate Women in Physics was held virtually in January. Over 900 undergraduate women and gender minorities attended. Interaction was highly encouraged through Zoom breakout rooms for Q&As with speakers, a networking fair with approximately 40 exhibitors, student lightning talks, and randomly assigned speed networking activities. A highlight was the Millie Dresselhaus CUWiP Keynote presented by Mary James. Participants were from the United States and 16 other countries. Support came from the National Science Foundation (NSF), the Department of Energy, the Heising Simons Foundation, the Alfred P. Sloan Foundation, Google Quantum, and General Atomics.



APS Chapters

The APS Chapters program celebrated its first anniversary in November. Established to support graduate students, postdocs, and early career professionals, the program now has 14 institution-based chapters in the United States with a combined membership exceeding 400 physicists. The chapters conducted various local activities in 2021, such as workshops on being an effective author and transitioning from a postdoc to a staff scientist, discussions on careers in industry, and peer-led research presentations. Chapter leaders also participated in two virtual meetings: the APS Chapter Officers Summer Convocation in July and the APS Chapter Officers Workshop in November.

National Mentoring Community Conference

In February, APS hosted the fourth APS National Mentoring Community Conference (NMC) in collaboration with the National Society of Black Physicists, the National Society of Hispanic Physicists, and Oklahoma State University. The 160 conference attendees included students from groups traditionally underrepresented in physics and physicist mentors from academia, industry, and government. During the virtual gathering, students and mentors attended plenary talks, panels, and workshops on career planning, undergraduate research, community building, and mentoring best practices.

APS Virtual Career Fair

In September, nearly 900 undergraduate students, graduate students, and early-career scientists registered for the 2021 APS Virtual Career Fair. This new three-day event included a job fair, graduate school fair, and résumé help desk. Hosted on the Gather platform, the Virtual Career Fair featured 40 graduate programs and 27 employers.

Promoting Industrial Physics

The Industry Mentoring Program (IMPact) connects students and early-career physicists with experienced mentors in the industrial sector. In 2020, APS expanded IMPact to include undergraduates and international students, as well as mentors. This change resulted in a 10% growth rate in 2021.

APS News highlighted physicists working in medical physics, data science, and quantum information science (QIS) in 2021. As a result of the QIS story, APS strengthened its connection with the Quantum Economic Development Consortium's Technical Advisory Committee on the Workforce.



Participants pose for a photo at the National Mentoring Community Conference

Global Efforts

APS is committed to serving as a global hub for physicists, providing a welcoming community where physicists worldwide can connect and advance their shared interests. In 2021, Society leadership convened a subcommittee to develop a roadmap for expanding international engagement and ensuring that APS benefits the global community. This effort builds on APS's collaborative activities and strong partnerships with other national physics societies and international physics organizations.

Inspired by a focus group of young international physicists representing 20 countries, APS hosted the 6-part webinar series *Working in the US: Career Development for International Physicists*. The series reached over 1,800 people and addressed professional opportunities for non-US citizens in the United States, understanding US visas and work authorizations, and navigating cultural differences, among other topics.

APS co-organized two events in partnership with the Indian Physics Association. The webinar *Publishing with APS* reached more than 800 students and early-career physicists across India with information about writing and publishing scientific papers. The two-day online event *Towards Gender Equity - New Directions and Steps* featured scientific talks by eminent scientists from the United States and India as well as a panel discussion on gender biases and best practices in training, mentoring, and setting family leave policies. The event drew viewers from both countries, including many APS members in India.

“It was great to chat with multiple employers who were looking for applicants with my skills. There usually aren't any opportunities for physics PhD graduates to do this except at the March Meeting.”

— Career Fair Attendee

Advance scientific discovery and research dissemination

16 Peer-reviewed journals

>21,400 Articles published

>5,600 Open access articles published

20 Scientific conferences organized

>21,000 Scientific presentations at APS Meetings

Open Access Journals

Physical Review X (PRX) celebrated its tenth anniversary and once again was ranked the world's highest-impact fully open access journal in the Clarivate Journal Citation Reports category of Physics, Multidisciplinary.

APS published more than 200 open access articles in *PRX Quantum* in 2021, its first full year of publishing. The journal was accepted for indexing in the Web of Science SCIE, which means it will receive its first Impact Factor in mid-2022. *PRX Energy*, the second PRX-inspired title, opened for submissions with David Scanlon from University College London as its inaugural Lead Editor.

For the second straight year *Physical Review Research* was the largest fully open access journal in the *Physical Review* family, publishing more than 1,200 peer-reviewed articles across its inclusive, multidisciplinary scope of coverage.

Open Access Partnerships

2021 was the fourth year APS participated in the Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP³). *Physical Review Letters*, *Physical Review C*, and *Physical Review D* published a combined 2,548 open access articles under SCOAP³ in 2021, more than in any previous year of the partnership.

APS piloted a successful Read and Publish agreement in 2020 with the Max Planck Digital Library (MPDL), which serves the scientists of the 86 institutes operated by the Max Planck Society in Germany. Building on this success, APS signed a multiyear agreement to extend the arrangement through 2024, with an option for 2025.

APS also successfully entered into multiyear transformative agreements with the European Organization for Nuclear Research (CERN) and King Abdullah University of Science and Technology (KAUST) in Saudi Arabia, and renewed its agreement with the Bibsam Consortium in Sweden. These agreements allow authors at participating institutions to publish open access articles in *Physical Review* primary research journals with ease and without being invoiced for article publication charges. Through them APS published over 580 open access articles in 2021.



APS Meetings

The 2021 APS March Meeting was entirely virtual and welcomed a record-breaking 13,090 attendees. The meeting featured more than 11,000 presentations, as well as a job expo, Wiki edit-a-thon, networking events, and more. A highlight was the Kavli Foundation Special Symposium, which featured distinguished researchers in quantum computing and machine learning.

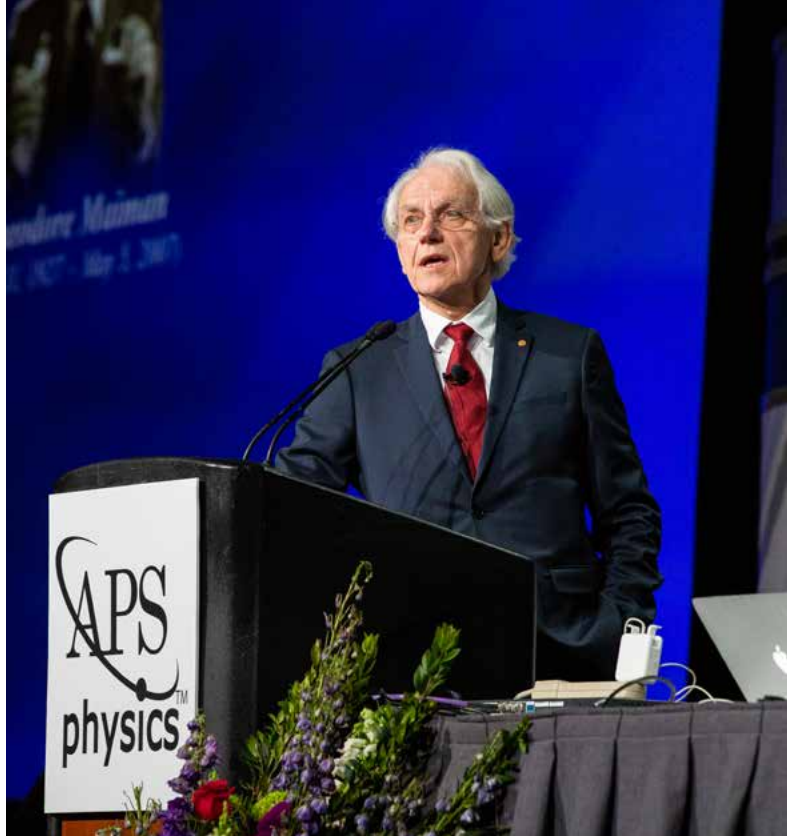
Physicists also gathered online for the 2021 APS April Meeting, themed “Quarks to Cosmos.” The Kavli Foundation Nobel Prize Session featured 2020 Physics Laureates Reinhard Genzel, Andrea Ghez, and Sir Roger Penrose. Other highlights included a plenary on advancing an inclusive community in science, a session on science on a global scale, and career-related events for students.

As the number of COVID-19 cases decreased and with strict health safety protocols, APS held two hybrid meetings in the fall of 2021. The Annual Meeting of the APS Division of Plasma Physics took place in Pittsburgh, Pennsylvania and the Annual Meeting of the APS Division of Fluid Dynamics took place in Phoenix, Arizona. Both had a virtual component to ensure that those unable to attend in person could still participate.

APS Honors

APS bestowed more than 60 prizes and awards to outstanding members of the physics community. Three awardees were honored in a special documentary highlighting their careers and contributions to physics.

- The APS Medal for Exceptional Achievement in Research was awarded to Gordon Baym for “major discoveries in theoretical condensed matter and many-body physics, neutron star structure and composition, quark matter and quark-gluon plasma physics, and in atomic physics and ultracold quantum gases.”
- The Julius Edgar Lilienfeld Prize was awarded to William M. Jackson for outstanding contributions to physics and exceptional skills in lecturing to diverse audiences.
- The George E. Valley, Jr. Prize was awarded to Vedika Khemani as an early-career scientist who has made an outstanding scientific contribution to physics that is likely to have high impact.



Gérard Mourou gives a presentation at the APS March Meeting

International Young Leaders Forum

Nearly 50 physicists from 22 countries gathered online for the first APS International Young Leaders Forum in February. The meeting convened young, service-oriented physics leaders from six continents to discuss the specific needs of graduate students and early-career physicists worldwide and how APS can help address these concerns. One of the highlights was a session on publishing in peer-reviewed journals that included a Q&A with *Physical Review* journal editors.

Gordon & Betty Moore Foundation Fundamental Physics Innovation Awards

The Gordon and Betty Moore Foundation Fundamental Physics Innovation Awards provided funding for ten new grants in 2021, its final application cycle. The awards provide support for individuals to meet and share ideas about how fundamental measurements or experiments might be conducted without large capital outlays. A total of 55 awards have been given since the program's inception in 2018 that have facilitated visits between individual researchers as well as gatherings of hundreds of physicists. Meetings have focused on expanding our knowledge of theory and experimentation precision measurements, high energy physics, nuclear physics, dark matter, particle physics phenomenology, astroparticle physics, and quantum optics, and other topics.

Advocate for physics and physicists, and amplify the voice for science

>8,500

Connections with Congress, including emails, social media posts, and phone calls

>85

APS members attended more than 120 meetings during two virtual Congressional Visit Days

Legislation on the STEM Workforce, Science, and Innovation

APS partnered with other scientific societies to advocate for several pieces of legislation in 2021. This included the NSF for the Future Act, which has a key provision to broaden research opportunities to bolster the domestic STEM workforce. In January, APS released the report, “Building America’s STEM Workforce: Eliminating Barriers and Unlocking Advantages,” underscoring the need for that provision. APS President Sylvester James Gates, Jr. then co-authored an op-ed in The Hill on this topic. APS members wrote to Congress expressing their appreciation after the NSF for the Future Act passed the House with strong bipartisan support.

APS members also wrote to Congress in support of several other pieces of legislation that later passed the House: The Department of Energy Science for the Future Act, the Supporting Early-Career Researchers Act, the STEM Opportunities Act, the MSI STEM Achievement Act, and the Combating Sexual Harassment in Science Act. Some of these were included in Sen. Majority Leader Chuck Schumer’s (D-NY) US Innovation & Competition Act, which passed the Senate with bipartisan support.

Research Security

APS continued to advocate for the US government to take a balanced approach when addressing concerns about the security of US research and foreign influence. The Society engaged policymakers and federal officials on this issue via meetings with APS leadership and more than 600 letters from APS members to Congress. In a letter to the Biden Administration, APS President Sylvester James Gates, Jr. outlined recommendations



Attendees pose for a photo at the APS March Meeting

for adjusting the China Initiative — a targeted security effort that sowed fear among scientists of Asian descent, restricted legitimate international scientific collaboration, and hindered the United States in the race for global talent. Following these efforts, the FBI described plans to rebalance its investigations, and in February 2022, the Department of Justice announced that it was ending the China Initiative.

Visas and Immigration

In 2020, the US Department of Homeland Security sought to eliminate a “duration of status” classification that allowed international students studying in the United States on certain visas to remain in the country as long as they complied with their terms of admission. About 1,600 APS members submitted comments opposing the proposed change to a fixed number of years. In July 2021, the Department of Homeland Security withdrew its intent to make this change.

APS continued advocating for Congress to authorize international students pursuing advanced STEM degrees to express their intent to stay in the United States and pursue post-graduation careers, and to provide international students who earn advanced degrees in STEM with a clear path to a green card. Two proposed pieces of legislation include similar provisions, the APS-endorsed Keep STEM Talent Act and the US Citizenship Act.

Climate Change

In November, the APS Council approved a revision to the Society’s climate change statement that clearly implicates human activities as the “dominant driver” of climate change.

Also in 2021, US Sen. Martin Heinrich (D-NM) and US Rep. Diana DeGette (D-CO) introduced resolutions to reinstate methane emission regulations for the oil and gas industry that were rolled back by the Trump Administration. APS members contacted Congress nearly 2,300 times in support of the resolutions. The resolutions passed and President Joe Biden signed the legislation into law on June 30.

The Coalition for Nuclear Threat Reduction

The Physicists Coalition for Nuclear Threat Reduction launched in 2020 and is supported by the APS Innovation Fund. One of the Coalition’s first advocacy activities was to write letters to Congress pushing for a five-year extension of the New Strategic Arms Reduction Treaty between the United States and the Russian Federation. The treaty limits the number of long-range nuclear weapons in both countries and was set to expire in February 2021. It has now been extended through 2026.



Attendees gather at the APS March Meeting

Coalition members also presented 53 colloquia at universities and national laboratories. They highlighted the physics, history, and risks of nuclear weapons and potential policy opportunities to reduce the dangers. As a result, the Coalition grew to 600 members by the end of the year.

Congressional Visits Days

APS held its first virtual standalone Congressional Visits Day (CVD) in February 2021, with members participating in more than 80 congressional meetings. In preparation, the Society developed a website for congressional staffers that hosts summaries of its science policy priorities and a virtual lounge. In June, APS utilized these tools during a second standalone CVD as part of the APS-AAPT Physics Department Chairs Conference. Nearly 90 members participated in the two CVDs, advocating for action on research funding, sexual harassment in STEM, visas and immigration, climate change, helium accessibility, and broadening STEM participation.

Rights of Scientists

APS is committed to defending the rights of scientists, in particular scientists who are wrongly imprisoned or otherwise under threat. In 2021, the Society’s efforts included advocacy on behalf of scientists in Iran, Bahrain, the Russian Federation, and the United States.

Share
the excitement
of physics and
communicate
the essential role
physics plays in the
modern world

>2,400

Registrants for the
Annual Leadership
Meeting

\$400,000

Awarded in Innovation
Fund grants

6,140

News stories generated
by research published in
Physical Review journals

30

Press conferences hosted
by the APS Press Office

APS Annual Leadership Meeting

APS hosted its second Annual Leadership Meeting as a fully virtual event. The meeting brought together APS members, volunteers, and leaders to discuss important issues facing the scientific community and celebrate recent accomplishments in physics. US Rep. Bill Foster (D-IL) and former US Rep. Bart Gordon (D-TN) gave talks on the impact of federal policy on science. Other sessions focused on communicating science, supporting physics departments, and increasing diversity, equity, and inclusion.

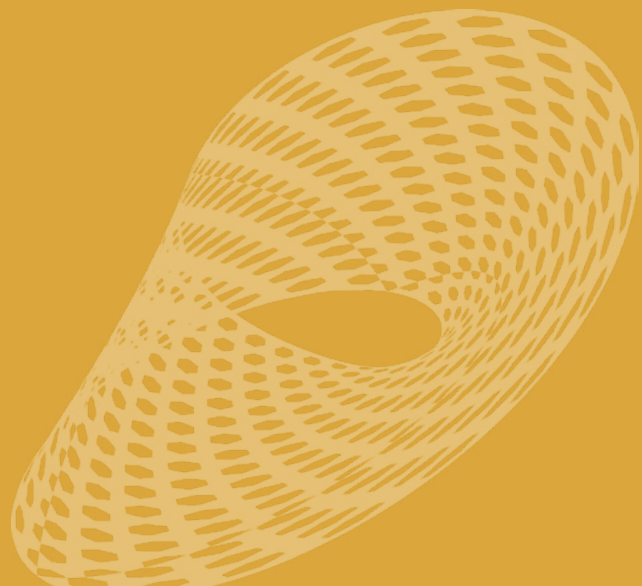
International Year of Quantum Science and Technology

In celebration of 100 years of scientific inquiry using quantum mechanics and to raise awareness of the importance of quantum science and technology for society, APS is leading an effort to have the United Nations designate 2025 as the International Year of Quantum Science and Technology.

In October, this proposal was endorsed by the International Union of Pure and Applied Physics (IUPAP) at its General Assembly. APS began preparing a resolution to this end, along with the German Physical Society and other supporting organizations, for consideration by the 2023 General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the 2023 General Assembly of the United Nations.

Quantum Crossing

APS hosted a special virtual event called Quantum Crossing to inform and excite middle and high school students about careers in Quantum Information Science and Technology (QIST). Quantum Crossing was held in October, in collaboration with the National Q12 Education Partnership and the QtoWork program. Lockheed Martin, IBM Quantum, IONQ, Quarks Interactive, and Microsoft created virtual tours of quantum labs that students could visit on a video game-style platform. The companies also had staff on hand to chat with students and teachers about working in the quantum industry. Representatives from the US Office of Science and Technology Policy (OSTP) also chatted with students about why the US government is invested in promoting careers in quantum. Over 130 teachers and 300 middle and high school students registered for the event.



PhysicsQuest Kits

PhysicsQuest kits introduce middle school students to basic concepts in physics through fun experiments. They are sent to teachers on request for use in the classroom. In 2021 the Society began partnering with members to create PhysicsQuest content centered on modern physics topics and applications. The first result of these efforts, the 2021 quest, highlights the incredible life and work of Deborah Jin. As they learn her story, students do four quantum science and technology activities. APS received an unprecedented number of requests and ran out of its more than 16,000 kits within a few days.

APS Innovation Fund

The APS Innovation Fund (IF) supports collaborative projects that promote and diffuse the knowledge of physics for the benefit of humanity while serving the broader physics community. In 2021 the fund awarded \$400,000 to two projects; the Equity, Diversity, and Inclusion Fellows, which seeks to foster inclusion and increase the retention of individuals with identities underrepresented in physics, and the Data Science Education Community of Practice, a collaborative effort to integrate data science into the physics curriculum.

The nine projects that previously earned IF awards made positive gains in 2021, including creating a search engine for discovering relevant talks at the APS March Meeting and translating 15 volumes of material into Spanish for use throughout Latin America, among many others.

Physicists To-Go

In the fall, APS launched a new initiative to provide middle and high school classrooms with virtual visits from physicists. Teachers request visits and APS matches them with physicist volunteers based on interest and availability. More than 600 teachers have requested visits and over 100 physicists have volunteered. The virtual visits will happen in Spring 2022.

Webinar Series: Engaging the Public through Science

In the summer of 2021, APS launched its first workshops on public engagement. This three-month webinar series focused on helping APS members develop skills for effectively engaging the public through science. Topics included writing op-eds, storytelling, digital video editing, and creating podcasts and videos that engage audiences. More than 30 invited speakers shared their expertise, and the workshops reached nearly 1,000 APS members.



Participants pose for a photo at the National Mentoring Community Conference

APS Wiki Scientist Initiative

As part of APS's continued efforts to elevate the visibility of underrepresented physicists on Wikipedia, the Society offered three training courses in partnership with Wiki Education during 2021. Two courses focused on creating and expanding the biographies of minority and women physicists, and a new course centered on increasing literacy in Quantum Information Science. The courses guided participants through the process of adding their knowledge to Wikipedia.

In addition, the Committee on the Status of Women in Physics sponsored a Wiki edit-a-thon themed "Women Make the World Go Round" during the APS March Meeting. In June, APS partnered with Black in Physics on an edit-a-thon to celebrate Juneteenth and increase the visibility of hidden figures in physics. The Wiki scientist initiative has led to 93 new articles and the editing of more than 500 articles to date. They have a combined 18.7 million views.

“I enjoyed the feeling that I was contributing to something greater than me.”
— Wiki Scientist Course Participant

Promote effective physics education for all

>350

Faculty attended
conferences

~50%

Of US physics
departments are
members of PhysTEC

APS Inclusion, Diversity, and Equity Alliance (APS-IDEA)

Created in 2020, the APS Inclusion, Diversity and Equity Alliance (APS-IDEA) continued its work of transforming the culture of physics by supporting 99 institutional teams of physics students, staff, and faculty. APS-IDEA workshops were held in the spring and fall of 2021 to orient new members and deepen participant understanding of effective change strategies, and groups of teams met online throughout the year. APS also launched the APS-IDEA Virtual Colloquia Series. In 2021, the project secured funding from the Alfred P. Sloan Foundation, the AIP Diversity Action Fund, the Burroughs Wellcome Fund, and several private donors. The program was initially funded through the APS Innovation Fund.

Effective Practices for Physics Programs (EP3)

APS leads the NSF-supported EP3 initiative in collaboration with the American Association of Physics Teachers. EP3 aims to support physics department leaders by providing strategies for thriving programs, help for departments under threat, and professional development on enacting departmental change. In 2021, after a rigorous process of community-led development and peer review, EP3 released the first 17 sections of a guide to effective practices for use by physics departments. EP3 also held the second round of Department Action Leadership Institutes (DALIs), supported in part by the APS Innovation Fund, and conducted the first of several planned site visits to HBCUs.

APS Bridge Program

The APS Bridge Program continued its focus on increasing the number of students from underrepresented ethnic and racial groups who complete PhDs in physics. Thirty-nine new graduate students were welcomed into 17 physics programs for the 2021-2022 academic year. This brings the total number of Bridge students to 338, of which 14 have completed a PhD in physics. The current retention rate for Bridge students is 78%, much higher than the national average of 60% for physics doctoral programs.

Inclusive Graduate Education Network

APS continues to lead the Inclusive Graduate Education Network (IGEN), a collaborative partnership across dozens of societies, institutions, corporations, and laboratories working towards achieving equity in graduate education across the physical sciences. IGEN exists to connect qualified Black, Latinx, and Indigenous students with Bridge Programs that have demonstrated their commitment to high quality, inclusive graduate education.



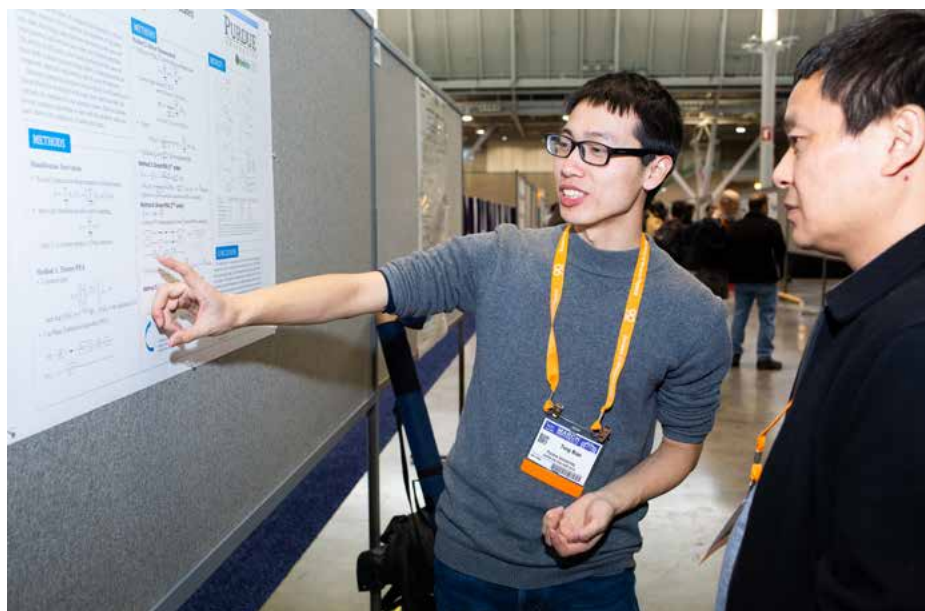
In 2021, a total of 210 applications were submitted through the IGEN Bridge Student Application Portal, resulting in more than 80 placements in Bridge Programs affiliated with the American Chemical Society, American Geophysical Union, and APS. IGEN also hosted the Second IGEN National Meeting and two Bridge Department Leaders Meetings, and its new website igenetwork.org reached over 23,000 users.

Physics Teacher Education Coalition

The Physics Teacher Education Coalition (PhysTEC) is a partnership of APS and the American Association of Physics Teachers that supports programs that prepare and support high school physics teachers. In 2021, PhysTEC published a new framework encapsulating its 20 years of expertise ensuring that physics teacher education programs are sustainable. The framework navigates the complex interactions between the champions of physics teacher education, their institutions, and the communities they serve. PhysTEC is supported by NSF.

Physics Department Chairs Conference

Designed by and for chairs, the 2021 Department Chairs Conference had almost 150 attendees. Sessions focused on supporting physics majors through key transitions, reforming introductory courses, how to be an effective chair, building thriving physics programs, and equity, diversity, and inclusion. A kick-off workshop was held for new department chairs. APS and the American Association of Physics Teachers cohosted the conference.



A presenter shares a poster at the APS March Meeting

Physics and Astronomy New Faculty Workshops

The long-standing Physics and Astronomy New Faculty Workshop series facilitated two virtual workshops in 2021 to create robust exchanges of ideas and creative online interactions for faculty members, soon-to-be faculty members, and leading innovators in physics and astronomy education. The workshops reached more than 200 new physics faculty members. Participants learned teaching techniques, were introduced to various resources, and networked with their peers. The NSF-supported workshop was sponsored by APS, the American Association of Physics Teachers, and the American Astronomical Society.

STEP UP Program

STEP UP is a community of physics teachers, researchers, and professional societies that design lessons to empower high school teachers, create cultural change, and inspire young women to pursue physics in college.

In July, the STEP UP program hosted a virtual summit to support teachers transitioning to virtual learning environments because of COVID-19. Experienced STEP UP teachers took the lead in training 180 teachers new to the program. They also held regular follow-up meetings and offered one-on-one support after the event. STEP UP now includes more than 1,400 high school physics teachers from all 50 states and around the world.

“It was essentially one-stop shopping with physics department resources on how to recruit, how to develop programs, how to be an effective chair, and how to implement 21st century strategies into the classroom.”

— Faculty member using the EP3 Guide

Finances

December 31, 2021

Like most organizations, APS flexed and adjusted during fiscal 2021 to deliver on its mission while adapting to ever changing external factors. In spite of operating under very different business circumstances, the organization ended the year with increased revenues. Total Assets of the American Physical Society increased from \$271.6M to \$294.3M, due largely to a strong return on investments and positive income from operations.

Net Assets without Donor Restrictions are composed of \$198.7M of undesignated assets and \$49.6M of board designated assets. Net Assets with Donor Restrictions increased from \$18.4M at the end of 2020 to \$19.7M at the end of 2021. APS has total Net Assets of \$268.0M, which increased by \$271M during 2021.

APS recognized \$62.0M of operating revenues and incurred operating expenses of \$59.8M resulting in net income from operations of \$2.2M. Non-operating income provided an additional \$23.5M of earnings. (The non-operating activities reflect a one-time loss of \$(5.5M). This loss is associated with the sale of real estate owned by APS in New York, as the fair market value of the property was less than APS's net investment in the property; the sale closed in early 2022.) Net Assets with Donor Restricted assets increased \$1.4M.



December 31, 2020 and 2021 (in Millions)

STATEMENT OF FINANCIAL POSITION

<i>Assets</i>	2020	2021
Cash & Cash Equivalents	\$ 23.7	\$ 22.1
Investments, at Fair Value	221.1	249.7
Accounts Receivable	2.6	3.2
Pledges Receivable	0.0	0.1
Prepaid Expenses	2.3	3.0
Equity Interest in American Center for Physics	5.0	5.2
Land, Building and Equipment	16.2	0.7
Interest in Beneficial Trust	0.7	0.7
Land and Building Held for Sale	0.0	9.6
TOTAL ASSETS	\$ 271.6	\$ 294.3

Liabilities and Net Assets

Liabilities

Accounts Payable and Accrued Expenses	\$ 6.4	\$ 6.5
Deferred Revenues:		
Publications	11.5	7.4
Membership Dues	2.6	2.6
Other	0.1	0.7
Total Deferred Revenues	14.2	10.7
Post-Retirement Benefits	10.2	9.1
TOTAL LIABILITIES	30.7	26.3

Net Assets

Undesignated	174.1	198.7
Designated by Board	48.4	49.6
Net Assets Without Donor Restrictions	222.5	248.3
Perpetual by Nature	5.3	5.7
Purpose Restrictions	13.1	14.0
Net Assets With Donor Restrictions	18.4	19.7
TOTAL NET ASSETS	240.9	268.0
TOTAL LIABILITIES AND NET ASSETS	\$ 271.6	\$ 294.3

STATEMENT OF ACTIVITIES

<i>Net Assets</i>	2020	2021
Net Assets Without Donor Restrictions		
Operating Activities:		
Operating Revenues	\$ 56.7	\$ 62.0
Operating Expenses	56.5	59.8
Income from Operations	0.1	2.2
Non-operating Activities:		
Income from Investments	23.2	27.6
Other Non-operating Income	5.0	1.5
Impairment on Land and Building Held for Sale	0.0	(5.5)
Income from Non-Operating Activities	28.1	23.5
TOTAL CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS	28.3	25.7
TOTAL CHANGE IN NET ASSETS WITH DONOR RESTRICTIONS	0.5	1.36
TOTAL CHANGE IN NET ASSETS	\$ 28.7	\$ 27.1

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Gifts to APS are an investment in the future of physics. Our generous donors support vital efforts in education, diversity and inclusion, public engagement, career development, science advocacy, international affairs, recognizing excellence, and membership access. Together, we can advance and diffuse the knowledge of physics for the benefit of all.

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The APS Legacy Circle recognizes donors who support the Society's mission and vision through planned gifts. By including APS in their estate plans, these forward-thinking individuals are creating an enduring legacy that will benefit researchers, industrial physicists, educators, students, and the general public far into the future.

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William Halperin, Division of Condensed Matter Physics
James Freericks, Division of Computational Physics
Howard Stone, Division of Fluid Dynamics
Manuela Campanelli, Division of Gravitational Physics
John Fourkas, Division of Laser Science
Peter Schiffer, Division of Materials Physics
Baha Balantekin*, Division of Nuclear Physics
Elizabeth Simmons, Division of Particles and Fields
Stuart Henderson, Division of Physics of Beams
Amitava Bhattacharjee*, Division of Plasma Physics
Karen Winey, Division of Polymer Physics
Charles H. Bennett, Division of Quantum Information
Heinrich Jaeger, Division of Soft Matter
Laurie McNeil, Forum on Education
LaNell Williams*, Forum on Graduate Student Affairs
Virginia Trimble, Forum on the History and Philosophy of Physics
Jim Adams, Forum on Industrial and Applied Physics
Emanuela Barzi, Forum on International Physics
Beverly Karplus Hartline*, Forum on Physics and Society
Nadia Fomin, Southeastern Section
Nora Berrah*, New England Section

Senior Leadership Team

Jonathan A. Bagger, Chief Executive Officer
Mark Doyle, Chief Information Officer
Jane Hopkins Gould, Chief Financial Officer
Beth Gunzel, Chief Human Resources Officer
Matthew M. Salter, Publisher (through November 2021)
Francis Slakey, Chief External Affairs Officer
James W. Taylor, Deputy Executive Officer and Chief Operating Officer
Michael Thoennessen, Editor in Chief

* 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

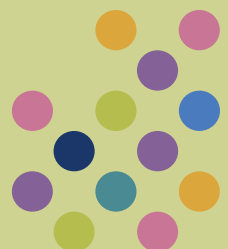
As physics benefits from being a global endeavor, we seek to create the conditions for free and open scientific exchange across national boundaries and political and ideological divides.

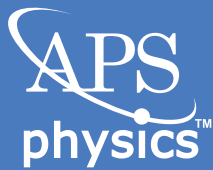
SPEAKING OUT

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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