

**American Institute
of Physics**

AIP

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of Physics

2019 ANNUAL REPORT

A composite image featuring the faces of a man and a woman, overlaid with a complex, glowing, and abstract representation of physics concepts. The image includes mathematical formulas, diagrams, and a central glowing sphere, suggesting a focus on scientific research and education.

Framing Our Future

aip.org

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aip.org

The American Institute of Physics (AIP) is a 501(c)(3) membership corporation of scientific societies. AIP pursues its mission—to advance, promote, and serve the physical sciences for the benefit of humanity—with a unifying voice of strength from diversity.

In its role as a federation, AIP advances the success of its Member Societies by providing the means to pool, coordinate, and leverage their diverse expertise and contributions in pursuit of a shared goal of advancing the physical sciences in the research enterprise, in the economy, in education, and in society.

In its role as an institute, AIP operates as a center of excellence using policy analysis, social science, and historical research to promote future progress in the physical sciences.

Over the last 400 years, the physical sciences have evolved a powerful predictive model of our world, enabling stunning technological achievements and enriching our understanding of the universe and our place in it. AIP has, for nearly a century, worked to advance, promote, and serve the physical sciences.



Framing Our Future: What it Means for AIP

Twelve months ago, when I sat down to reflect on the year's accomplishments, my focus was on engaging in meaningful conversations that are relevant to AIP as the preeminent federation focused on the physical sciences. As the still-then new CEO, I talked about the importance of AIP and framing our future, a future as One AIP, one federation, with one mission: to advance the physical sciences with a unifying voice of strength from diversity.

Today, as I reflect on the past year's accomplishments, my focus is on continuing to have meaningful conversations, with the goal of advancing those discussions, delving deeper into what it means to be a part of the AIP community.

While we are one, we also recognize AIP is made up of many. That is what gives us our strength. As a federation of 10 unique Member Societies that represent many tens of thousands of members from all corners of the globe, we are committed to diversity, equity, and inclusion.

But as many of you have heard me say throughout the year, I believe there is a deeper meaning to diversity, equity, and inclusion, one that goes beyond simply acknowledging and bringing together differences because it is the right thing to do. At the heart of this concept is the sense of belonging, of truly being welcomed, respected, and heard, regardless of your race, gender, ethnicity, sexual orientation, immigration status, religious identity, gender identity expression, or socioeconomic status. And that is what it means to be a member of the AIP family. You belong to a community that not only embraces but also celebrates diversity, equity, inclusion, and belonging.

With these commitments in mind, the AIP Board of Directors, along with input from staff and Member Societies, developed a Strategic Framework that articulates our vision for the future. I believe this is one of our most significant and transformative accomplishments to date, which is why we've decided to include it as an insert in this year's annual report. This framework and its four pillars serve as our roadmap for moving forward, ensuring we honor our past and prepare our institute, our federation, and future generations for what lies ahead. Core to our efforts to apply this framework and pursue our vision is the new Statement on Diversity our AIP Board adopted recently (see page 14).

To ensure that we frame our future for success, it is going to take **One AIP** working collectively and individually to advance our federation and institute. On the following pages, read about how we are doing just that.

—Michael H. Moloney, CEO

A Vibrant Federation:

Members, Mission, and Milestones

Public Policy & Membership

In 2019, AIP assisted our Member Societies with dozens of visits to Capitol Hill to meet with their elected officials to advocate for science, funding, STEM education, and more.

- AAPT: Coordinated meetings with 21 congressional offices, including working on the 2nd Master Teacher Policy Fellows Summit, where a group of 11 new fellows visited 26 House and Senate offices and had six one-on-one meetings with members of Congress.
- AAS: Coordinated 13 congressional visits with astronomers from Wisconsin, Minnesota, Michigan, New York, New Jersey, and Pennsylvania.
- APS: Coordinated seven meetings, escorting a team of physicists from Virginia and West Virginia.
- AVS: Coordinated 15 meetings in conjunction with the annual STEM on the Hill day in April.

AIP also escorted the 20 members of the US Physics Team — high school students sponsored by AAPT and AIP to represent the United States at the International Physics Olympiad Competition — around Capitol Hill. The visit included solving physics problems with Rep. Bill Foster (D-IL), the only PhD physicist currently in Congress.

AIP continues to actively support all 10 Member Societies at their annual meetings. Support ranges from conducting media training to providing government-relations counsel to hosting special programming and events.



AIP supports the national meetings of its Member Societies with activities around the student experience, careers, history, media support, and public policy. Shown here are panelists at the AIP-sponsored discussion, “Transitioning to a Data Science Career,” at the 233rd AAS Meeting.



The 2019 U.S. Physics Team does some problem solving with Congressman Bill Foster (D-IL), currently the only PhD physicist in Congress.

“Bringing the sciences and humanities together is important for not only telling the compelling history of discovery but also inspiring the next generation of scholars in both fields.”

— Michael H. Moloney, AIP CEO

Educators: Inspiring Future Generations

Building on the importance of communications, AIP sponsors two scientists annually to spend a year providing scientific and analytical expertise to members of Congress through its Congressional Science Fellows program. The program enables scientists to broaden their experience through direct involvement with the legislative and policy processes. Fellows gain a perspective which, ideally, will enhance not only their own careers but also the physical sciences community's ability to communicate more effectively with Congress. The 2019 fellows are Brian Gray and Nicholas Montoni. Gray received his PhD in ecology, evolution, and organismal biology from UC Riverside and was placed with the office of Rep. Jan Schakowsky (D-IL). Montoni received his PhD in physical chemistry from the University of Washington and was placed with the office of Rep. David Price (D-NC).

Through a generous contribution from AAS, AIP also sponsors a State Department Fellowship program. This fellowship is intended to enhance the science and technology capacity of the department by enabling a scientist or engineer to work at the department's Washington, DC, headquarters for a one-year term. The 2019 fellow is Allison Davis, who received her PhD in civil engineering/civil systems at the University of Colorado Boulder. Davis was placed at the Bureau of Oceans and International Environmental and Scientific Affairs, Office of Conservation and Water.



Brian Gray



Nicholas Montoni



Allison Davis

Grad Students: Learning about the Art of Science Communications

Initiated in 2013 by graduate students at Harvard University, MIT, and the University of Colorado Boulder, ComSciCon is a series of workshops focused on the communication of complex and technical concepts. The workshops are organized by graduate students for graduate students. This year, AIP provided funding for the first ComSciCon specifically for graduate students in the physical sciences. For two days, students gathered at AIP headquarters in College Park, MD., to discuss diversity, equity, and inclusion; media engagement; science communication; and science policymaking. ComSciCon involved staff from six Member Societies — AAPM, AAPT, AAS, American Meteorological Society (AMS), APS, and OSA — the SPS & Sigma Pi Sigma, and six AIP Affiliated Societies.

A Center of Excellence: Our Heritage and Our Future

Celebrating our Heritage

AIP's dedication to preserving our history continues through the Niels Bohr Library & Archives (NBLA) and the Center for History of Physics (CHP).

The NBLA is a repository and clearinghouse for information in the history of physics, astronomy, geophysics, and allied fields, and in 2019, the library completed its inventory on the Wenner Collection, a recent acquisition of more than 3,800 rare and valuable books. This impressive addition to the library's existing collections was the catalyst for a new blog, *Ex Libris Universum*, where NBLA staff discuss their archival and book collections, as well as the history of science in general.

In June, AIP was invited by the Danish Embassy to hold a reception to showcase some of the library's most precious items from the Wenner Collection. The event, hosted by Danish ambassador Lone Wisborg, highlighted how the history of the physical sciences is an international collaboration.

This year, AIP also received an extensive collection of files from long-time *Physics Today* editor Gloria Lubkin (who died Jan. 26, 2020). Prior to her retirement in 2009, Lubkin

interviewed countless physicists, Nobel laureates, and reported on important discoveries. Her papers contain a wealth of correspondence, notes, and interviews that serve as a valuable and insightful resource for those interested in science, scientific publishing, and history.

To explore the challenges AIP and our physical sciences community at large will face in documenting ongoing projects in science, the CHP sponsored the History Observatory Workshop. Funded by the Gordon and Betty Moore Foundation — established by Intel's co-founder and his wife to support, among other things, scientific discovery — the workshop examined a new concept observatory for how AIP could demonstrate leadership and innovation in how we record history and archive the stories of discovery in our diverse, digitized, and globalized scientific community.

As a further demonstration of AIP's commitment to honoring and preserving the stories of science, AIP established a new oral history unit.





In June, AIP participated in an evening of scientific and cultural exchange between Denmark and the United States when we were invited to feature our newly acquired Wenner Collection of rare books from the Niels Bohr Library & Archives at The Embassy of Denmark to the United States. The event, held at the residence of Ambassador Lone Wisborg, showcased selected items from our rare books collection and included remarks from Ambassador Wisborg, AIP CEO Michael H. Moloney, AIP Board chair David Helfand, and Dr. Vilhelm Bohr, grandson of Niels Bohr. Clockwise from top left are Ambassador Lone Wisborg; a selection of rare books from our newly acquired Wenner Collection; AIP Board chair David Helfand; AIP Board members Michael C. Morgan (left) and Jack G. Hehn; Dr. Vilhelm Bohr; and AIP president Michael H. Moloney (left) and National Science Foundation director France Cordova.

Preparing for the Future

Today's students are tomorrow's scientific leaders. AIP continues to engage the full spectrum of educators and students with initiatives that introduce the physical sciences to students at a young age, provide supportive spaces for educational and networking events aimed at undergraduate and graduate students, and disseminate educational tools and resources.

K-12 Students: Engaging and Educating Early

AIP offers more than 50 free Teaching Guides on the History of Women and Minorities in Physical Science that highlight the historical contributions to the physical sciences by women and minorities. The guides, which meet national educational standards, are designed to be easily integrated into classrooms, ranging from first grade through college, and showcase a diverse set of role models in STEM. In 2019, AIP revised several of the teaching guides, including one on Elmer Imes, the second African American to earn a PhD in physics. AIP also added a new lesson plan on Ben Barres, who became the first openly transgender scientist in the National Academy of Sciences in 2013.

AIP's Venture Partnership Fund provided a grant to the 2nd Annual Master Teacher Policy Fellowship Summit. The purpose of this summit organized by the American Association of Physics Teachers (AAPT) is to engage physics and physical sciences educators as agents of change in the K-12 system. The program aims to empower and support teacher-driven efforts to improve educational policy at the state and/or district level as it pertains to the teaching and learning of physics.



Clockwise from top left: Michael P. Anderson, Ronald E. McNair, Guion S. Bluford Jr., Jeanette J. Epps. From the "Meet Four Pioneering African American Astronauts" teaching guide.



Ben Barres. From the "Ben Barres: Neurobiology Pioneer and Champion for Equity in STEM" teaching guide.

Bringing Our Heritage to the Classroom

AIP's support doesn't stop with students. This year, AIP made a \$1 million pledge to the University of Maryland College of Arts and Humanities to establish an endowed professorship in the history of natural sciences and support of humanistic and scientific research and scholarship. After a national search, *Physics Today* senior editor Melinda Baldwin has been appointed as the first AIP Endowed Professor in the History of Natural Sciences. Baldwin will teach a range of history of science courses, with the goal of encouraging deeper insight into the nature and origin of the physical sciences and their impact on society. She will also serve as a student mentor.



Melinda Baldwin, AIP Endowed Professor in the History of Natural Sciences



University of Maryland president Wallace D. Loh, left, and Michael H. Moloney, chief executive officer at AIP. The \$1 million gift from AIP will establish an endowed professorship in the history of natural sciences and support the appointee's scientific research and scholarship.
Credit: Thai Nguyen of University of Maryland

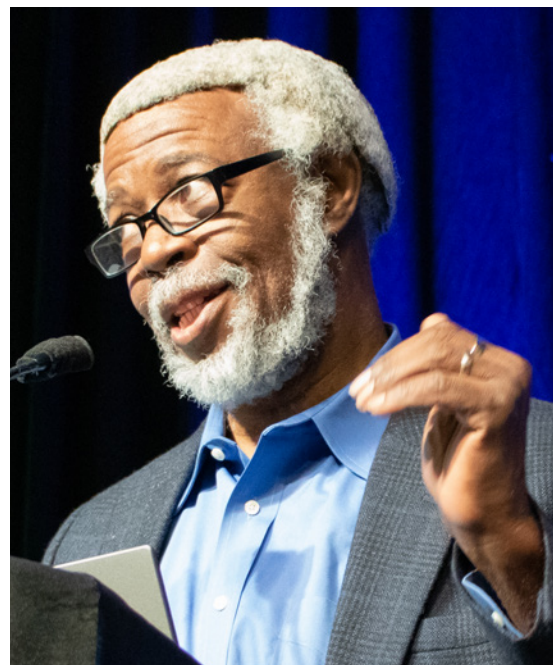
Undergraduate Students: Building a Foundation for Success

AIP's newest resource, the Graduate School Advising Guide, was developed to help undergraduates in the physical sciences and their advisors identify suitable graduate programs. The guide provides a listing of schools, along with some of the most common criteria students use in selecting a graduate program. For maximum impact, AIP recommends using the guide in conjunction with its highly popular *GradSchoolShopper: Graduate Programs in Physics, Astronomy, and Related Fields*, a comprehensive directory that provides information on most U.S. doctoral and master's programs in physics and astronomy. The directory also lists a number of related-field departments, such as materials science, engineering, chemical physics, and optics.

To provide real-world, practical work experience, the Society of Physics Students (SPS), a professional society for students and their advisors, offers a 10-week summer internship program for undergraduate physics students. The interns gain hands-on experience in science research, education, and policy by being placed within government and nonprofit organizations throughout the Washington, DC, region. In 2019, SPS placed 17 interns with various organizations—including AAPT, APS, The Optical Society (OSA), SPS, The Society for Rheology (SOR), NASA, NIST, and the House of Representatives Committee on Space, Science, and Technology. Interns also worked for AIP's Center for History of Physics, the Niels Bohr Library & Archives, and AIP publications FYI and *Physics Today*.

To connect students with the scientific community, AIP once again supported the Physics Congress (PhysCon) attended by more than 1,100 students, making it the world's largest gathering of undergraduate physics students. Hosted by AIP and organized by the physics honors society, Sigma Pi Sigma, the three-day PhysCon meeting focused on professional development, careers in physical sciences, and skills development around research, outreach, and science communication.

For first-generation college students and those who are persistently underrepresented in physics and astronomy, AIP is working with the AAPT Committee on Physics in Undergraduate Education to remove barriers to graduate school applications. The committee is working with AIP staff and stakeholders to examine how data is collected and presented inside GradSchoolShopper, paying attention to any wording that could possibly be impeding to first-generation or underrepresented students. This collaboration aims to present a more accessible, inclusive product that resonates with all students.





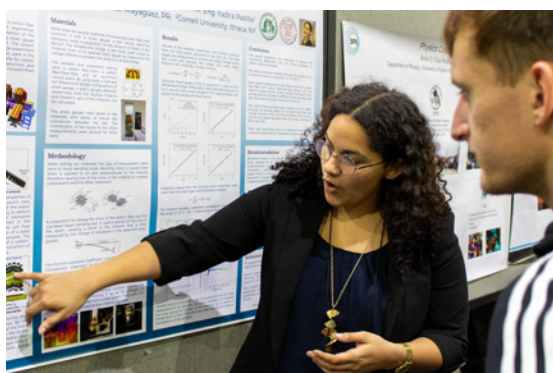
The 2019 Physics Congress in Providence, Rhode Island, saw more than 1,100 undergraduate students come together for three days of meetings focused on professional development, careers in physical sciences, and skills development around research, outreach, and science communication. The event was hosted by AIP and organized by the physics honor society, Sigma Pi Sigma.

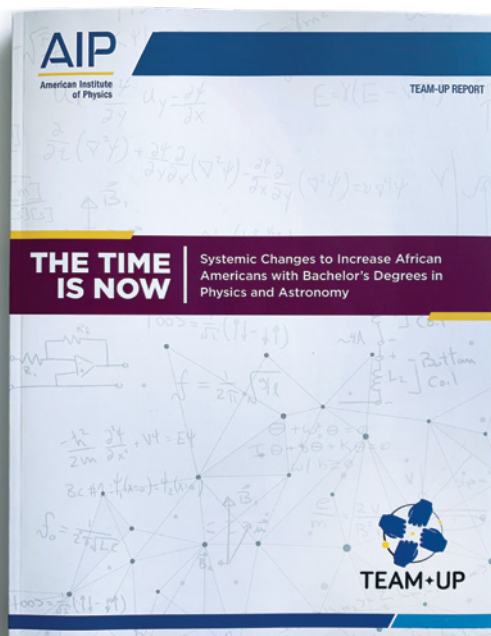


In March, the governing council of the Society of Physics Students and of Sigma Pi Sigma, the physics honor society, approved the following statement for general dissemination, which adds to its 2016 SPS Statement on Diversity and Inclusivity:

Official Society of Physics Student Statement

"The Society of Physics Students (SPS) welcomes all students with a passion for physics independent of identity, regardless of but not limited to race, ethnic origin, religious beliefs, gender, gender identity, sexual orientation, disability, age, family and socioeconomic status, or cultural background. Many groups are underrepresented in physics, and SPS and Sigma Pi Sigma have not always been welcoming to diverse groups. Today all our events are subject to our Code of Conduct, and SPS and Sigma Pi Sigma are committed to working to correct this exclusion and will continue to update our policies and best practices in pursuit of promoting diversity, inclusion, and equity."





TEAM-UP

Having spent two years studying and analyzing the long-term and systemic issues that result in the persistent underrepresentation of African Americans in physics and astronomy, an AIP expert report is calling for more recognition and better awareness of the experiences of the small number of African American students who study in these fields. The report also provides a set of comprehensive recommendations for sweeping changes in physics and astronomy culture.

The AIP-chartered National Task Force to Elevate African American Representation in Undergraduate Physics & Astronomy, known as TEAM-UP, carried out this in-depth study. Completed in 2019, the study included student and departmental surveys, in-person interviews with African American students, and site visits to high-performing physics departments in colleges and universities. TEAM-UP worked with AIP's Statistical Research Center (SRC) to conduct the surveys of physics undergraduates and physics departments, and they also helped to analyze the data, providing perspective and input to the committee. The resulting report lays out an ambitious plan to double the number of African Americans graduating with bachelor's degrees in physics and astronomy by 2030.

Awards

AIP recognizes individuals for their outstanding contributions to our physical sciences enterprise. Awards are presented in a number of categories.

AIP Science Communication Awards honor the best science writing. 2019 winners include:

- **BOOKS** (co-winners): David L. Hu for *How to Walk on Water and Climb Up Walls* (Princeton University Press) and Marcia Bartusiak for *Dispatches from Planet 3* (Yale University Press),
- **ARTICLES:** Nathaniel Rich for “Losing Earth – The Decade We Almost Stopped Climate Change. A Tragedy in Two Acts” (*New York Times Magazine*),
- **WRITING FOR CHILDREN:** Raman Prinja for *Planetarium* (Bonniar Books, UK/Big Picture Press US), and
- **BROADCAST AND NEW MEDIA:** Rushmore DeNooyer for “NOVA - Black Hole Apocalypse” (the WGBH Educational Foundation).

The Andrew Gemant Award honors contributions to the culture, artistic, and humanistic dimension of physics. This year’s winner was University of California professor and former astronomer Virginia Trimble, who was honored for her lifelong successes in the physical sciences. In particular, she was recognized for taking the broader view of how physics and astronomy are accomplished, creatively engaging physical scientists and the public throughout her lifetime, and her commitment to establishing science within the social perspective.

The Dannie Heineman Prize for Astrophysics is administered jointly by AIP and the American Astronomical Society to honor outstanding

mid-career work in astrophysics. This year’s winner was Edwin A. (Ted) Bergin, professor and chair of astronomy at the University of Michigan, who was honored for his work using chemistry to probe the physics of star and planet formation and to help trace the molecular origins of life.

The Dannie Heineman Prize for Mathematical Physics is administered jointly by AIP and APS to honor valuable published contributions in mathematical physics. This year’s winners were University of Utah’s Bill Sutherland, Sapienza University of Rome’s Francesco Calogero, and IPhT CEA Saclay’s Michel Gaudin. All three were honored for their contributions to the field of exactly solvable models in statistical mechanics and many body physics, in particular the construction of the widely studied Gaudin magnet and the Calogero-Sutherland, Shastry-Sutherland, and Calogero-Moser models.

The Abraham Pais Prize for History of Physics recognizes outstanding scholarly achievements in the history of physics and is awarded annually jointly by APS and AIP. This year’s winner was Helge Kragh at the University of Copenhagen’s Niels Bohr Institute, who was recognized for the analyses of cosmological theories and debates, the history of the quantum physics of elementary particles and the solid state, and biographical studies of Paul Dirac and Niels Bohr, and his early quantum atom.

To read about other AIP awards, visit aip.org/aip/awards



A Trusted Source of Information: Our Reputation and Readership

Some of the top stories making news in 2019 included the first-ever picture of a black hole, the 50th anniversary of Apollo 11, and developments in quantum computing. The demand for trustworthy news and information about science continues to rise, and AIP publications continue to deliver, with articles frequently being picked up by prominent media outlets around the world.

In-depth reporting by *Physics Today*, the Institute's flagship magazine, included articles on

- The Department of Energy's controversial decision to award a \$113 million no-bid contract for uranium enrichment;
- The impact on physics of shortages and price hikes in the liquid helium market;
- NASA's controversial decision to shut down an ongoing physics experiment on the International Space Station;
- The threat to weather forecasting posed by new 5G telecommunications networks; and
- The strain on US-China scientific collaborations caused by trade wars and other geopolitical tensions.

Diversity, equity, inclusion, and belonging were also highlighted by the magazine. An online news story reported on the efforts that physics faculty at St. Mary's College of Maryland are making to prevent exclusionary and harassing behavior toward women and minority students. The October special issue on careers included a feature article by Alexander Rudolph about Cal-Bridge, a coalition among California's higher-education systems that connects promising juniors and seniors from underrepresented groups with STEM faculty mentors to ease their transition from undergraduate to graduate programs.

"Venus is not Earth's Closest Neighbor," an article that reevaluates the way we think about the distances between planets, set records for *Physics Today's* website. Of the article's 125,000 page views, 100,000 came within the first four days, making it the quickest PT article ever to reach that figure. Dozens of other media outlets covered the story, including Gizmodo, *Popular Mechanics*, and the UK's *Daily Mirror*.

Research produced by SRC continues to be featured in a monthly column in the American Association of Physics Teachers' peer-reviewed journal, *The Physics Teacher*, which focuses on



Physics Today – May 2019



Physics Today – July 2019

teaching introductory physics. SRC also published a report, “Women in Physics and Astronomy, 2019,” which was highlighted in *Physics World*, published by the Institute of Physics. The SRC report was an update to the highly popular 2005 report of the same title.

Staff from FYI, AIP’s source for breaking news and in-depth analysis of federal science policy, reported on summits at the White House on the National Quantum Initiative and the cross-agency Joint Committee on the Research Environment.

Also, back by popular demand was the second annual “10 Science Policy Stories to Watch,” which was published by FYI.

Meanwhile, the audience for AIP’s Inside Science continued to grow. The number of original stories for Inside Science topped 200. The number of Inside Science stories that were reprinted increased by more than 70 percent from 2018

to 2019, and page views increased by more than 227,000 year-over-year. Inside Science’s five most visited pages published in 2019 were as follows:

- Nine Nobel Prize Predictions for 2019
- Water from South African Mine May Contain Life That Was Isolated for 2 Billion Years
- Inside the Controversial World of Composting Toilets
- Inside Science front page for its coverage of the 2019 Nobel Prizes in Physiology or Medicine, Physics, and Chemistry
- Archaeologists Find Evidence of the Iron Age Siege of Jerusalem

AIP introduced 60-second social media videos — “Science in 60” — based on Inside Science articles. Views of Inside Science’s news videos topped 850,000 on YouTube, with syndication extending the video audience to the website of ABC News as well.



Rachel Ivie, AIP’s senior director of education and research, and Susan White, interim director of the Statistical Research Center, presented the results of the Global Survey of Scientists to the Conference on Global Approach to the Gender Gap in Mathematical, Computing, and Natural Sciences held at the International Centre for Theoretical Physics in Trieste, Italy, in November. There were more than 100 participants from 60 different countries. The final report from the project will be published in January 2020.

American Institute of Physics:

Striving to Deliver Excellence

Diversity Statement

In support of AIP's new Strategic Framework, the Board of Directors has adopted the following statement on diversity:

AIP believes that the inclusion of diverse individuals within the physical sciences community is vitally important to the health and well-being of the scientific enterprise. Empirical evidence shows that diverse perspectives lead to better solutions to problems, better decision-making, and better outcomes. We understand that discrimination, exclusion, and inequity are ethically wrong and damaging, both to those affected and to the scientific community, squandering precious talent. Further, we believe that being ever mindful of diversity will enhance AIP's understanding and responsiveness to the experiences and needs of our communities, thereby improving our ability to respond to the ever-changing environment of those we serve.

AIP recognizes that not all individuals or institutions are afforded equal access to resources, support, or opportunities; we believe that attention and commitment to equity within the scientific enterprise are absolutely necessary to enable the success of the individuals and institutions within our community.

Fostering equity and a sense of belonging for all who are a part of our community requires coordinated action and change across a broad range of institutions. As a federation of physical science professional societies, AIP embraces our unique opportunity and responsibility for advancing equity in our community.

AIP will learn from, support, and collaborate with its Member and Affiliate Societies to promote greater

diversity, equity, inclusion, and belonging across the physical sciences community. More specifically, AIP will seek to exemplify an institution committed to the principles of equity-mindedness, consciously focused on achieving equitable outcomes for our colleagues and the communities we serve through all of the Institute's policies, programs, and actions.

AIP is committed to establishing a workplace that serves as a model for collaboration, respect, diversity, equity, inclusion, and belonging by ensuring that these values are embodied in our practices for convening, volunteer recruitment and service, hiring, management, and retention. As part of our commitment to integrity, accountability, transparency, and openness, AIP will establish comprehensive policies and goals with respect to these issues and make them broadly known and accessible. AIP will actively and regularly evaluate its progress and solicit the feedback of its staff, Member Societies, and other stakeholders.

The American Institute of Physics (AIP) is a nonprofit federation that advances the success of our 10 Member Societies and an independent institute that operates as a center of excellence supporting the physical sciences enterprise.

AIP also owns AIP Publishing, a wholly owned nonprofit subsidiary based in Melville, NY, that advances the physical sciences by publishing journals and providing services and tools for the scientific community.

AIP Member Societies cover a broad range of fields in the physical sciences and collectively represent more than 120,000 scientists, engineers, educators, and students in the global physical sciences community, including those in the areas of astronomy, medicine, acoustics, and more.

Our Leadership

AIP Board of Directors, 2019

David J. Helfand, Chair, AAS
 Judy R. Dubno, Interim Corporate Secretary, ASA
 John Kent, Treasurer, At-Large
 J. Daniel Bourland, AAPM
 Susan Burkett, AVS
 Jack G. Hehn, AAPT
 Kate Kirby, APS
 Kevin B. Marvel, AAS
 Michael Morgan, AMS
 Faith Morrison, SOR
 Elizabeth Nolan, OSA
 Cheryl R. Stevens, ACA
 Susan K. Avery, At-Large
 Allison Macfarlane, At-Large
 Nathan Sanders, At-Large

AIP Officers

Michael H. Moloney, Chief Executive Officer, AIP
 Steve Mackwell, Deputy Executive Officer, AIP
 Catherine “Gigi” Swartz, Chief Financial and Administrative Officer, AIP

Our Member Societies and the Year They Joined

NOTE: AIP also has 27 Affiliated Societies
 (Visit aip.org/member-societies for more details.)

1931

Acoustical Society of America (ASA)
 American Physical Society (APS)
 The Optical Society (OSA)
 The Society of Rheology (SOR)

1932

American Association of Physics Teachers (AAPT)

1966

American Astronomical Society (AAS)
 American Crystallographic Association (ACA)

1973

American Association of Physicists in Medicine (AAPM)

1976

Science & Technology of Materials, Interfaces, and Processing (AVS)

2013

American Meteorological Society (AMS)

Other Member Organizations

Sigma Pi Sigma
 Society of Physics Students



All in favor? Passed. The AIP Board of Directors approves a 2020-2025 Strategic Framework for the Institute.

Consolidated Financial Overview (IN THOUSANDS)

	2019	2018	2017
Investments	\$189,226	\$157,486	\$174,040
Total Assets	\$252,135	\$218,397	\$230,702
Total Net Assets	\$208,449	\$178,826	\$191,950
Investment Return	17.7%	-5.6%	16.4%

Operating Activities

Total Revenue	\$77,907	\$70,442	\$67,001
AIP Publishing, Net	\$15,585	\$15,079	\$14,809
AIP Programs, Net	\$(10,652)	\$(10,116)	\$(11,183)
Net Operating Surplus	\$4,933	\$4,963	\$3,626

Our Finances

In 2019, AIP posted its 10th consecutive year of positive net operating results, a testament to our long-term commitment to overall operational excellence. The year also served as preparation for our Strategic Framework, which will take shape in the coming years at the Institute.

Some noteworthy 2019 financial highlights include

- Net surplus from operations of \$4.9M
- Net assets increased 16.6% to \$208.4M
- Investments generated a return of 17.7%, increasing to \$189.2M
- Net release from restricted reserves of \$9.4M
- AIP's Board of Directors approved the creation of new Board Designations to better align our financial assets with key priorities. Notably, AIP created the Niels Bohr Library & Archives and the Center for the History of Physics Sustainability Fund, with the goal of fully endowing these programs in the future. AIP also created a Risk Reserve, which provides liquidity for key operational risks that may occur during the year without any foreseen notice.

Board guidance provides for annual spending from reserves to be in a range of 3-5 percent. This board mandate provides financial discipline that allows for long-term financial stability balanced with a diversified investment approach that seeks stable asset appreciation. The overarching theme is to manage short-term operational needs with long-term overall net asset growth.

AIP received an unmodified opinion (clean) from BDO USA, LLP in the Independent Auditors Report that was reviewed by the Audit Committee.

AIP is grateful for the generous support provided by donors and sponsors for its programs and awards and will continue to be a disciplined steward of its financial assets.

AIP Publishing

AIP Publishing serves the community through scholarly publishing activities in the fields of the physical and related sciences. With around 31 million full-text downloads, 15,000 peer-reviewed articles, and 147 volumes of conference proceedings in 2019, AIP Publishing is committed to advancing global science.

- AIP Publishing partnered with AVS to launch AVS Quantum Science. This new journal covers the rapidly evolving field of quantum science, which studies how the world works on the smallest scale.
- Applied Physics Reviews published its first original research articles, expanding the scope of this high-impact journal.
- AIP Publishing welcomed new editors-in-chief to six journals: *Applied Physics Letters*, *AIP Advances*, *Journal of Renewable and Sustainable Energy*, *Journal of Mathematical Physics*, *Biomechanics*, and *AVS Quantum Science*. The editors-in-chief come from diverse backgrounds and geographies spanning North America, South America, Europe, and Asia, reflecting the global nature of AIP Publishing's authors and reviewers.
- China Academy of Engineering Physics has partnered with AIP Publishing to publish the open-access journal *Matter and Radiation at Extremes*.
- The Editorial Advisory Board for *APL Photonics* selected five members to its new Early Career Editorial Advisory Board. With research areas spanning the multidisciplinary photonics community, these early career researchers bring a unique perspective to the editorial board of the journal.
- Two new awards for early career researchers have been established. The Journal of Mathematical Physics Young Researcher Award and The Journal of Chemical Physics Emerging Investigators Award join the APL Photonics Future Luminary Award and the APL Materials Excellence in Research Award.

AIP Publishing Board of Managers (2019)

David J. Helfand, Chair
Alan Jeffrey Giacomini, Secretary
Susan E. Fox, Treasurer
John Haynes, CEO, AIP Publishing
Michael H. Moloney, CEO, AIP
Diane Bartoli
Theodora Bloom
Wolfgang Christian
Gerald Fuller
Kathleen Kingscott
Thomas Koetzle
Valeria Molinero
Ivan Petrov
Kristen Ratan

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Overarching Strategy

AIP advances the physical sciences with a unifying voice of strength from diversity.

AIP provides the means for its Member Societies to pool, coordinate, and leverage their diverse expertise and contributions in the pursuit of the shared goal of advancing the physical sciences in the research enterprise, in the economy, in education, and in society.

Through their partnership in AIP, Member Societies broaden their impact and achieve results beyond their individual missions and mandates. AIP also acts as an independent institute where research in social science, policy, and history advances the discipline of the physical sciences.

Together, AIP and its Member Societies convey a unifying message for stakeholders in government, academia, the nonprofit and private sectors, the student and teacher communities, and the general public.

AIP's Strategic Framework comprises an overarching strategy and four strategic goals—focused on AIP as a Federation and an Institute and AIP's Reputation and Excellence. Each goal has four strategic objectives.

AIP will be:

- 1** A vibrant federation that advances the success of our Member Societies.
- 2** A center of excellence that advances the physical sciences enterprise through research and analysis aimed at improving the understanding of our heritage and promoting future progress.
- 3** A trusted and reliable source of information and analysis.
- 4** Recognized for cultivating an effective, talented, diverse, and engaged staff that delivers excellence to our stakeholders.

1 AIP will be a vibrant federation that advances the success of our Member Societies.

By 2025, AIP is recognized as a productive and collaborative partner that seeks to advance the success of its Member Societies. Our Members trust that we understand their strategic direction and their goals, and their individual members and leaders look to AIP as a partner and advisor in their Society's efforts to develop and pursue strategic and tactical initiatives of importance to their communities. Member Societies seek to partner with each other in AIP-convened forums focused on topics of shared interest, including on issues of diversity, equity, inclusion, and belonging. AIP is nimble, adaptable, and responsive to Member Society needs, offering a suite of Member-only resources and services to advance their success individually and collectively.

- Establish robust processes to identify and address mutual concerns on which AIP might partner with all or a subset of the Member Societies.
- Provide innovative mechanisms to build and sustain collaborative relationships among the Member Societies—and, where relevant, with other organizations,—on topics identified by AIP and by Member Societies.
- Assist each Member Society in researching, analyzing, and addressing issues related to the evolving trajectory, needs, and desires of its membership community.
- Create innovative approaches and practices to assist Member Societies with matters including society management, enterprise risk management, program sustainability and capacity, and strategic planning.

2 AIP will be a center of excellence that advances the physical sciences enterprise through research and analysis aimed at improving the understanding of our heritage and promoting future progress.

By 2025, AIP is called upon for its research and analysis expertise in relevant areas that include public policy, the demographics of relevant scientific communities, education, scholarly publishing, career development, and the history of the physical sciences. AIP is sought as a critical resource in addressing opportunities and concerns of the multi-sector physical sciences community. AIP is seen as **the Institute** that leads the physical sciences community toward an impactful understanding of how to be more welcoming to and supportive of the full diversity of physical scientists throughout their careers.

- Research and develop innovative approaches to identifying opportunities for and challenges to the community of physical scientists on issues including public policy, education, scholarly publishing, the demographics of relevant scientific communities, and the professional development needs of the physical scientist from undergraduate through retirement.
- Facilitate dialog and the interchange of ideas among physical scientists in the government, academic, non-profit, and private sectors to identify and address opportunities for, and challenges to, promoting progress in the physical sciences.
- Execute research and analysis in support of the design and implementation of actions to promote diversity, equity, inclusion, and belonging in the physical sciences community.
- Establish innovative approaches to both preserving and advancing the study of the heritage of the physical sciences, and forecasting the trajectory of the physical sciences.

3 AIP will be a trusted and reliable source of information and analysis.

By 2025, AIP is recognized as an independent institute that provides innovative, valued, and impactful content that addresses our audiences' needs. AIP is a trusted and accountable partner, promoting comprehensive dialog within the physical sciences communities. AIP's brand is distinctive and clear, supporting a unified content strategy.

- Build capacity to listen to and understand better AIP's diverse audiences and develop AIP's communication channels to strengthen the value and impact to our audiences across the physical sciences and beyond.
- Develop AIP processes to ensure our adherence to and reputation for transparency, impartiality, and independence in our communications on matters including public policy, the heritage of the physical sciences, and science news.
- Establish AIP's brand, so it empowers each member of our staff, our Member Societies, and other stakeholders to convey the vision of AIP as an independent federation and institute that advances the physical sciences.
- Create innovative marketing and media approaches to storytelling about the dynamics of and advances in the physical sciences enterprise.

4 AIP will be recognized for cultivating an effective, talented, diverse, and engaged staff that delivers excellence to our stakeholders.

By 2025, the Institute is recognized for empowering each member of the diverse AIP team to deliver leadership and success, for cultivating pride in all we do, and for being willing to take risks in the pursuit of success. At AIP, business processes are documented, formalized, and easily accessible across the Institute. AIP is recognized as a "best place to work" where staff retention is high and each member of a team feels valued, connected to AIP's mission, and held accountable. AIP Member Societies, audiences, and other stakeholders trust that the Institute will deliver excellence in all its activities.

- Evolve AIP's workplace culture to cultivate appreciation of, passion for, and pride in how we pursue our mission.
- Establish a model workplace environment that fosters collaboration, respect, diversity, equity, inclusion, and belonging, thereby improving our capacity to achieve excellence in all of AIP's programs and activities.
- Develop and adopt a comprehensive set of process standards and knowledge-management tools to strengthen and ensure timeliness, efficiency, and excellence in all that we do.
- Embrace excellence, integrity, accountability, transparency, openness, innovation, environmental sustainability, and leadership every day, in every AIP job.

STRATEGIC FRAMEWORK

Over the last 400 years, the physical sciences have evolved a powerful predictive model of our world, enabling stunning technological achievements and enriching our understanding of the Universe and our place in it. The American Institute of Physics has, for nearly a century, worked to advance, promote, and serve the physical sciences.

As we prepare for our second century, AIP has engaged in a thorough examination of our programs and activities to develop a strategic framework that will guide the Institute's operations and evolution over the next five years, from 2020-2025, with the goal of enhancing our impact on the physical sciences for the benefit of humanity.

Whereas AIP was established as a provider of publishing services to its Member Societies, it has evolved considerably over the decades. With the formation and now successful spinoff in 2013 of AIP Publishing into a wholly owned but independently operated LLC, a new direction for AIP is needed. In response, the Board of Directors has developed and adopted a new vision, supported by a strategic framework, that will guide the Institute as we head toward our centenary in 2031.

The Board has concluded that AIP has the opportunity to amplify its mission to advance, promote, and serve the physical sciences by focusing on four key goals:

- AIP as The Federation of Societies in the Physical Sciences;
- AIP as The Institute for Research on, and Analysis of, the Physical Sciences Enterprise;
- AIP as A Trusted Source of Information and Analysis; and
- AIP Delivering Excellence.

The strategic objectives that form the backbone of the Institute's approach to pursuing these goals will allow AIP to carry out the Board's vision of what success will look like in 2025. While this framework is ambitious, the Board of Directors has concluded it is achievable based on the Institute's financial and programmatic resources. The framework is designed to be flexible and adaptable as the Institute evolves.

