

20
18

ANNUAL
REPORT

Let's talk about science.



“The AIP Board is united in its conviction that the Institute has a vital role to play in advancing the success of our Member Societies and in promoting evidence-based decision-making, and we are enthusiastically engaged in aligning our strategic priorities with those goals.”

—DAVID HELFAND, INTERIM CHAIRMAN OF THE BOARD (2018)

The American Institute of Physics advances, promotes, and serves the physical sciences for the benefit of humanity. As a federation of physical science societies, AIP delivers a range of programs and services for students, researchers, scientists in industry, historians, policymakers, media outlets, and the public to promote the physical sciences.

Let’s Talk about AIP and Its Future

On many fronts, 2018 has been an exciting year, including for me personally. I was honored to become the ninth CEO in our Federation’s 87-year history, chosen to lead this great organization as we head toward our second century of existence with a compelling history behind us and an inspiring future ahead. As an experimental physicist, former diplomat, public policy expert, and AIP’s new leader, I believe strongly in the power of communication, innovation, and building community consensus to advance our science. We need to collaborate and innovate not only to advance the success of our 10 Member Societies—which collectively represent more than 120,000 scientists, engineers, educators, and students around the world—but also to advance the role of the physical sciences in society.

At this compelling moment in human history, science is changing rapidly and becoming more inter-, multi- and trans-disciplinary. Many of the frontiers of our knowledge are being advanced through research that aims to integrate knowledge across disciplines to address a specific challenge or opportunity, whether it arises

from deep scientific questions or pressing societal needs. Also, the human experience today is tightly integrated with the development of technology that, of course, is based clearly on the underlying fundamental discoveries of science. These are important contexts for AIP as we consider how to advance our mission.

Capitalizing on last year’s theme of “Excellence Matters,” the Institute has embarked on a strategic planning process to build on that excellence to help guide us further into the 21st century. We are examining our value proposition internally and externally. We are reviewing our goals to ensure they are aligned with our efforts to support the physical sciences and advance the success of our Member Societies.

In the end, we are **one** AIP, **one** Federation, with **one** mission: to advance, promote, and serve the physical sciences for the benefit of humanity. Our collective future will continue to be linked to progress being made by scientists and engineers around the world, including those who are members of the professional societies that constitute AIP. I look forward to working with the AIP community to ensure we can continue to pursue this mission. On the following pages, read about some of the ways we have done that in 2018.

—Michael H. Moloney, CEO



The AIP Board of Directors and senior staff at the September 2018 retreat.

Do your part to promote and support LGBTQ+ people in STEM. Follow the #LGBTSTEMDay hashtag on social media and contribute to the conversation by sharing personal stories, photos, and videos.

Let’s Talk about Diversity and Inclusion

While progress has been made toward increasing diversity and inclusion in the physical sciences, much work still needs to be done. AIP and its Member Societies are committed to ensuring workplaces are more representative of society.

AIP’s **Task Force to Elevate African American Representation in Undergraduate Physics & Astronomy (TEAM-UP)**, formed in December 2017, is examining the persistent underrepresentation of African Americans in physics and astronomy. In May, the task force, working with AIP’s Statistical Research Center, surveyed African-American students to better understand the factors that contribute to a student’s persistence in a physics or astronomy program, as well as factors that lead some students to leave physics or astronomy.

The task force also visited colleges and universities to hear from students, faculty, and administrators about the challenges and opportunities around increasing diversity and inclusion.

For the latest updates, follow the task force on Twitter, **@AIP_TEAMUP**, and join in on the Twitter Chat series, **#TEAMUPTalks**.

In June, AIP also held a special workshop for Member Societies, **“How to Achieve Diverse, Equitable, and Inclusive Professional Meetings,”** to consider optimal codes of conduct, policies, statements, and best practices that can be applied before, during, and after society meetings.

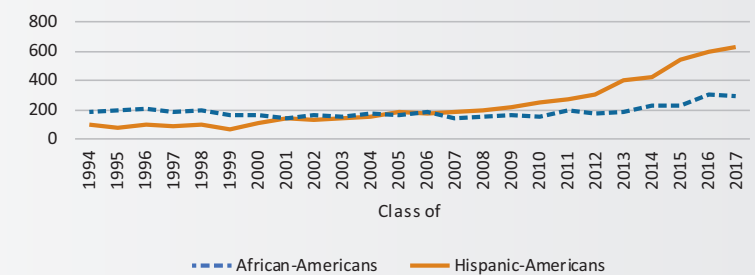
In an effort to increase diversity and inclusion in STEM, AIP partnered with organizations around the world on July 5 in celebration of **LGBTSTEM Day**. The goal of this global initiative is to raise awareness and increase support for LGBTQ+ people in science, technology, engineering, and math.

To help shine a light on the many contributions that minorities have made to the field, the October cover story of *Physics Today* recounted the accomplishments of Elmer Imes (1883–1941), the second African American to earn a PhD in physics.

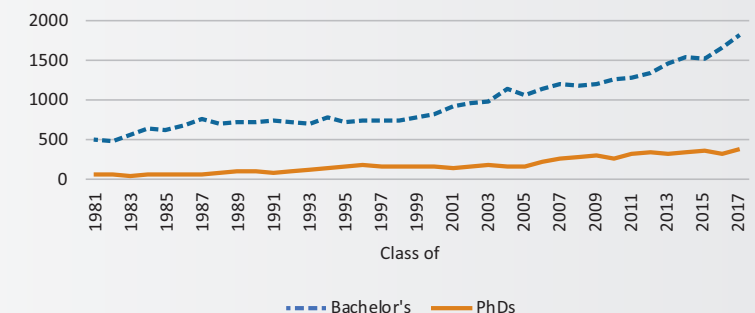


Members of the TEAM-UP.

NUMBER OF PHYSICS BACHELOR'S DEGREES AWARDED TO AFRICAN-AMERICANS AND HISPANIC-AMERICANS



NUMBER OF PHYSICS BACHELOR'S DEGREES AND PHDS AWARDED TO WOMEN



The Statistical Research Center collects degree data on physics graduates across the US and tracks trends, such as the increasing number of women and members of under-represented groups among physics degree recipients.

“[NAKED EYES] reflects the notion of “light” being an abstract matter, which needs intervention and design to become shape and volume. In this exhibition, light has been sculpted, contained, diffused, projected and reflected so Naked Eyes can enjoy the 3 dimensionality of it.”

—NOEMI SCHIPFER, VISUAL ARTIST AND CO-FOUNDER OF NONOTAK



Let’s Talk about the Science Community

In recognition of the **International Day of Light** on May 16, OSA and APS partnered with AIP, through a grant from the AIP Venture Partnership Fund, to underwrite and produce an interactive art exhibit at Washington, DC’s ARTECHOUSE, an innovative space dedicated to arts and technology. The exhibition, NAKED EYES, was the first solo exhibition in the US by the world-renowned artist studio NONOTAK, which works with audiovisual installations and performance pieces to create ethereal, immersive, and dreamlike environments.

The event drew more than 20,000 visitors. AIP’s Inside Science produced a documentary, which will premiere in 2019, about the artists who created the exhibit.

AIP Science Communication Awards turned 50 this year. The annual program recognizes the best science writing aimed at improving the public’s appreciation

of physical sciences, astronomy, math, and related scientific fields.

The 2018 winners are:

- **BOOKS:** *American Eclipse: A Nation’s Epic Race to Catch the Shadow of the Moon and Win the Glory of the World* by David Baron
- **ARTICLES:** *The Economist*: “Here, there and everywhere” by Jason Palmer
- **WRITING FOR CHILDREN:** *What a Waste! Where Does Garbage Go?* by Claire Eamer
- **BROADCAST/NEW MEDIA:** Science Channel: “How the Universe Works—Secret History of Pluto” by Wyatt Channell

The Andrew Gemant Award was presented to particle physicist David Kaplan for his achievements in producing “Particle Fever,” a documentary about the Large Hadron Collider’s first discoveries. The annual prize recognizes contributions to the cultural, artistic, and humanistic dimension of physics.



The Tate Medal for International Leadership in Physics went to Italian physicist Fabiola Gianotti for her leadership as spokesperson of the ATLAS international collaboration and as Director-General of CERN in promoting science as a vehicle for broad international cooperation. The Tate Medal is awarded every two years to non-US citizens for their leadership, research contributions, and service to the international physics community.

The Dannie Heineman Prize for Astrophysics was awarded to Vicky Kalogera for her contributions to advancing the understanding of the evolution and fate of compact objects in binary systems, with particular regard to their electromagnetic and gravitational wave signals. The Heineman Prize for Astrophysics is awarded jointly by AIP and AAS to recognize outstanding mid-career work in the field of astrophysics.

The Dannie Heineman Prize for Mathematical Physics was awarded to Barry Simon for his contributions to the mathematical physics of quantum mechanics, quantum field theory, and statistical mechanics, including spectral theory, phase transitions, and geometric phases, and his many books and monographs that have deeply influenced generations of researchers. The Heineman Prize for Mathematical Physics is awarded jointly by AIP and APS to recognize valuable published contributions made in the field of mathematical physics.

To educate the public at large, the **Lyne Starling Trimble Science Heritage Public Lecture Series** feature discussions led by prominent science historians and writers who highlight the important roles that science plays in modern society and culture. Lectures are held at AIP headquarters in College Park, MD and open to the public.

2018 lectures included:

- “ ‘The Negro Scientist’ ”: W.E.B. DuBois and the Diversity Problem in Science and the History of Science
- “Light and Shadow: Cold War Physics in Secret and in Public”
- “The Trouble with Einstein’s Time”
- “Shifting Problems in Modern Physics and in the Histories That We Write”

In support of its Member Societies, AIP contributed to the national meetings of all 10 members: AAPM, AAPT, AAS, ACA, AMS, APS, ASA, AVS, OSA, and SOR. AIP provided media and government relations services; special programming and events for students; job board support; career development events; government relations training and support; and invited talks on public policy, history of science, and data on diversity and education in the physical sciences community.

Let’s Talk about Public Policy

FYI, AIP’s source for breaking news in federal science policy, has expanded its policy tracking tools. For example, FYI was the first public news outlet to report on the House Science Committee’s plans to introduce the *National Quantum Initiative Act*, and FYI published detailed updates as the bill progressed through Congress. FYI also has enhanced its web-based tools for tracking federal science budgets, legislation, and leaders.

Top officials at several federal science agencies have affirmed that FYI helps them stay abreast of what is happening at other science agencies and is a tool they use to inform others about the trajectory of developments in their own agencies. FYI also educates the broader community about science policy and budgetary developments in Washington, DC.

AIP convened stakeholders from Member Societies to share messaging on policy options related to open access in scientific scholarly publishing. This effort aided in coordinating the message delivered to the White House Office of Science and Technology Policy by AIP, AIP Publishing, and Member Societies.

Every year since 1988, AIP and its Member Societies sponsor two scientists to spend a year providing analytical expertise and scientific advice to members of Congress. This year’s **Congressional Science Fellows** are Rukmani Vijayaraghavan and Gina Mazzuca, who were placed within the offices of Rep. Derek Kilmer (D-WA) and Sen. Dick Durbin (D-IL), respectively.



Vijayaraghavan, sponsored by AAS and APS, received her PhD in astronomy in 2015 from the University of Illinois at Urbana-Champaign. Her research focused on understanding the evolution of galaxies in the extreme environments of galaxy clusters using numerical simulations on supercomputers.



Mazzuca, sponsored by AMS, received her PhD in atmospheric and oceanic science in 2018 from the University of Maryland, College Park. Her research focused on the relationship between mesoscale meteorology and air pollution.

“The Wenner Collection’s value is not just in the individual items that are in the collection, but the way they’ve been collected, the way they’ve been catalogued, and the stories that they tell.”

—MICHAEL H. MOLONEY, CEO OF AIP

Let’s Talk about History

AIP received nearly \$1 million in grants for the Niels Bohr Library & Archives, one of the nation’s most concentrated collections dedicated to the history of physics, astronomy, geophysics, and allied fields.

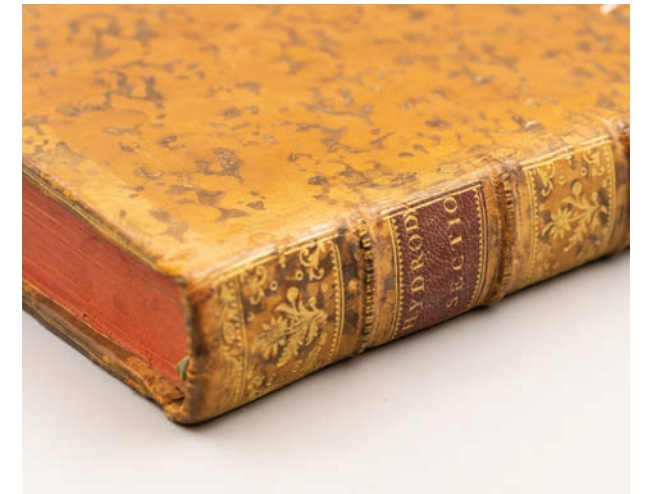
A \$300,000 grant from the National Endowment for the Humanities will help AIP create a secure vault to house rare books and archival material, including the recently acquired **Wenner Collection**. Covering nearly 500 years of history, the Wenner Collection contains more than 3,800 rare books and journals that include works by Ptolemy, Galileo, Huygens, Halley, Newton, Laplace, and many early 19th-century natural philosophers. A \$646,700 grant from the Alfred P. Sloan Foundation will be used to support global access to the collection through cataloging and digitization.

AIP received a \$66,000 grant from the Gordon and Betty Moore Foundation for planning a workshop on new ways to build history partnerships with large scientific collaborations. AIP also received a \$75,000 grant from an individual donor to help underwrite the cost of administering **AIP’s Oral History program**, which has amassed a collection of interviews dating back to the 1960s and provides insights into the lives, work, and personalities of many modern physicists. AIP began the process of digitizing its oral history collection in 2007. Today, nearly two-thirds of the collection is available online.

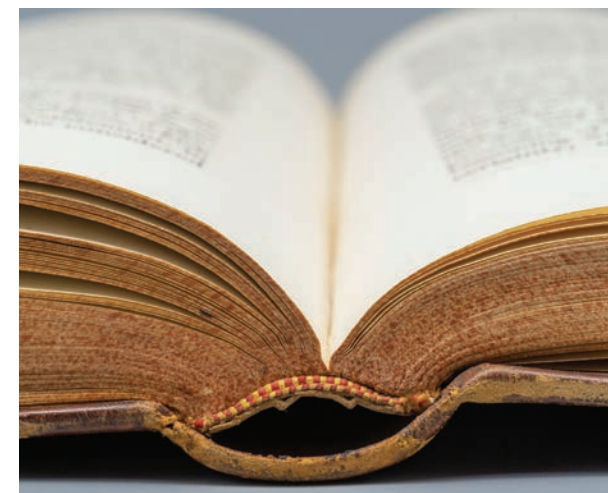
The Melba Phillips papers is the latest archival collection to be digitized and is now accessible to researchers in the Niels Bohr Library & Archives’ online digital repository. The collection, which spans from 1922 to 1999, provides a glimpse into the life of physicist Melba Phillips. In 1952, she lost her job for refusing to testify before the US Senate’s Internal Security Subcommittee (also known as the McCarran Committee), which was charged with investigating alleged communist activities. Throughout her career, Phillips received numerous awards and honors, including the AIP Karl Taylor Compton Medal for Leadership in Physics in 1981. The full, digitized collection of the Melba Phillips papers is available at repository.aip.org/islandora/object/nbla:AR2007746.



A sample of an audio excerpt from the Niels Bohr Library & Archives’ Oral Histories Interviews featured Henry Barton on his impressions of James Chadwick and Ernest Rutherford. Audio file is also available at bit.ly/2EodQrA.



More than 3,800 rare books and journals made a road trip in temperature- and humidity-controlled trucks from their home in Florida to their new home, the AIP Niels Bohr Library & Archives in College Park, MD.



“SPS has helped me forge connections and gain lifelong friendships in my chapter. Interning with SPS has also expanded my professional connections by exposing me to new physicists and career paths.”

—AMANDA WILLIAMS, WEBER STATE UNIVERSITY, OGDEN, UT

25% 
Career Network
job postings

Let’s Talk about Students and Jobs

The 2018 job market was a healthy one, and performance of the AIP Career Network reflected this trend. In 2018, institutions and organizations posted 25 percent more jobs than in 2017 on the online job board network for the physical science, engineering, and computing disciplines. The Career Network is managed by *Physics Today* Jobs and its partners: AAPM, AAPT, APS Physics, AVS, IEEE Computer Society, SPS, and Sigma Pi Sigma.

AIP also continued to expand and update its resources. The Statistical Research Center launched **Physics Faculty Salary Calculator**, which allows faculty members to see how their compensation compares to their colleagues. AIP’s most popular web resource, **Who’s Hiring Physics Bachelors**, was updated with more current employment data. The resource provides a state-by-state listing of companies that recently have hired physics bachelor’s degree recipients. SPS, working with AIP’s Statistical Research Center, updated the popular “Physics is for YOU” brochure with new employment and career data.

Nurturing the future generation is also a major priority. In 2018, AIP funded 90 travel awards to students representing more than 50 organizations and schools. In total, AIP gave away more than \$100,000 in grants, scholarships, and awards to students. AIP also supported and helped conduct

more than 20 regional meetings for students across the United States.

SPS and Sigma Pi Sigma launched the **Alumni Engagement Program** to connect undergraduates, departments, and professional alumni in physical science careers. Students can request alumni

to serve as speakers, tour leaders, mentors, and department visitors.

SPS also coordinated the relaunch of JURP, recast as the **Journal of Undergraduate Reports in Physics**, featuring original research by undergraduates along with student-authored articles about outreach, advocacy, Member Societies, and professional development efforts among undergraduates.

The **SPS summer internship program** offers 10-week positions for undergraduate physics students in science research, education, and policy with various organizations in the Washington, DC, area. In 2018, SPS placed 15 interns at various organizations, including NASA, NIST, and AIP Member Societies.

In May, AIP coordinated contiguous exhibits by AAPM, AAS, ACA, AMS, APS, ASA, OSA, and AIP’s Inside Science under the shared theme, “Every Day Physics,” for the **USA Science and Engineering Festival** in Washington, DC.

To cultivate middle school and high school students’ interest in the history of science, AIP began a three-year cooperative agreement with National History Day, a nonprofit education organization, to sponsor the first-ever **History of the Physical Sciences & Technology Prize**.



Amanda Nelson, AIP Archivist, with Ali Jones (right) of Spokane, WA receiving the History of the Physical Sciences & Technology Prize for her senior paper, “Galileo Galilei: A Conflict of Faiths”.

Let’s Talk about News and Magazines

AIP offers news and media services at meetings organized by our Member Societies—such as APS, OSA, ACA, AVS, and ASA. AIP also promotes the activities of AIP programs and the journals of AIP Publishing and its publishing partners. The result in 2018 has been coverage in a number of top-tier national and international media outlets: the *New York Times*, *The Washington Post*, *People* magazine, *USA Today*, BBC, Associated Press, the *Los Angeles Times*, and *Wired*, among others.

Physics Today—AIP’s flagship magazine—won four EXCEL Awards from Association Media & Publishing, an organization that promotes excellence in print and digital publishing by nonprofit organizations. AIP received the following awards:

- **Gold:** “Olive Spoons and Terrapin Forks”, February 2017 editorial
- **Bronze:** Journals, General Excellence, 2017
- **Bronze:** Journals, Cover Design, February 2017

- **Bronze:** Magazines (circulation of 100,001+), Feature Article Design: “The secret search for uranium in Cold War Morocco”, June 2017

“The war over supercooled water” (*Physics Today*, August) was the most popular story on the magazine’s website with more than 34,000 page views. The article reported on a seven-year dispute about supercooled water between two condensed-matter theorists.

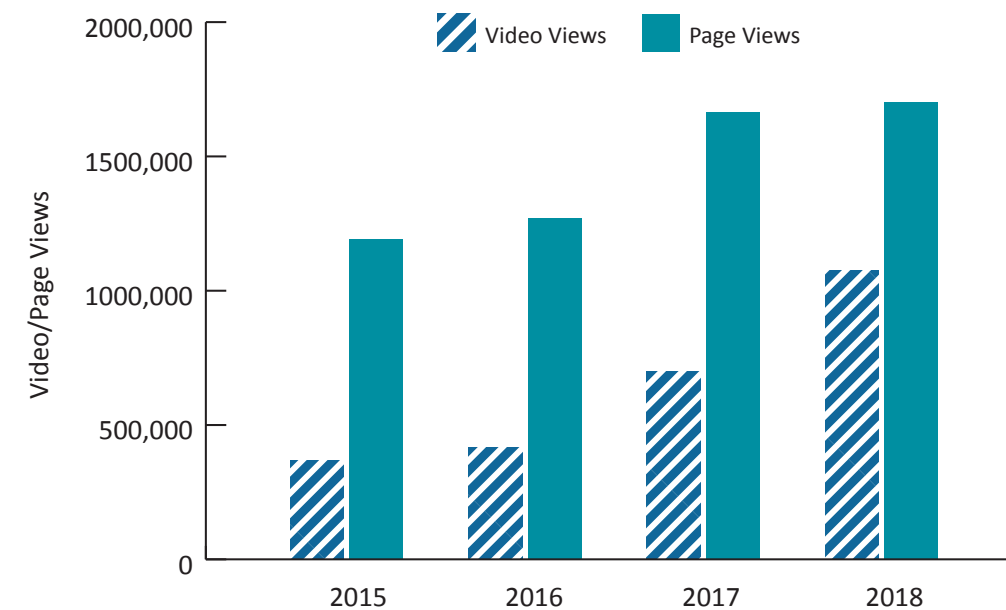
AIP, through its **Inside Science News Service (ISNS)**, continues to reach new audiences in the US and overseas. ISNS cemented syndication agreements with Chinese internet giant Tencent, ABC’s Good Morning America, and Kalmbach Media, publisher of *Astronomy* and *Discover* magazines. The Tencent syndication has resulted in more than 28 million story views of ISNS content.

AIP also took home a Gold MarCom Award for its 2017 Annual Report. The MarCom Awards, administered by the Association of Marketing and Communication Professionals, honors excellence in marketing and communication. Each year about 6,000 print and digital entries are submitted from around the world.

4 AM&P
EXCEL Awards
+
Gold
MarCom Award



INSIDE SCIENCE AUDIENCE TRENDS



“Our ultimate goal is to disseminate top-quality research as quickly as possible, and eliminating complexity caused by language barriers gives Chinese authors an opportunity to contribute their work to the global scientific community without unnecessary delay.”

—JASON WILDE, CHIEF PUBLISHING OFFICER, AIP PUBLISHING

Let’s Talk about AIP Publishing



As part of a year-long strategic planning process, AIP Publishing spent a great deal of time in 2018 talking with key stakeholders to better understand their needs—as authors, readers, referees, editors, librarians, and publishing partners. The resulting strategy supports AIP Publishing’s goal to expand the reach and impact of physical sciences research to the global community.

One key step is developing the high-impact journal *Applied Physics Reviews* into a flagship title through the addition of original research content. Another is developing a digital books publishing program to meet the needs of researchers who need to get up to date quickly in a new field.

AIP Publishing continues to meet the needs of the global research community for quality open access journals in topical areas, including *APL Bioengineering*, *APL Photonics*, *APL Materials*, and *Structural Dynamics*. Submissions to the multidisciplinary open access journal *AIP Advances* set a record high, up 23 percent over the previous year. Across the portfolio, AIP Publishing published more than 15,000 peer-reviewed articles and 135 volumes of conference proceeding.

AIP Publishing launched two new initiatives to assist with author workflows. In an ongoing effort to strengthen connections among researchers around the world, AIP Publishing launched a **Chinese language version of the AIP Author Services website** to better serve the fastest growing scientific authoring community with language editing services. A **new partnership with Overleaf** provides authors with AIP Publishing’s LaTeX article templates, collaborative authoring tools, and simplified submission process. More than 91,000 authors from across the globe submitted their work to AIP Publishing in 2018.

The American Institute of Physics Incorporated (tax exempt under section 501 (c)(3) of the Internal Revenue code) and Affiliates include the AIP Publishing LLC (AIPP), a disregarded entity under the AIP tax exempt status. AIPP is a single member and a wholly owned subsidiary of AIP. The primary purpose of AIPP is to support the scientific and educational mission of AIP through scholarly publishing activities in the physical and related sciences.

AIPP is the sole shareholder in AIP Global, Inc. (AIPG), a for-profit corporation. The primary purpose of AIPG is to advance the physical sciences for the benefit of society by acting as a business liaison for the dissemination of knowledge of physics and to collaborate and network with physicists.

AIP Publishing also forged new partnerships with two international societies for publishing services beginning in 2019: The Physical Society of Japan and the China Academy of Engineering Physics.

AIP PUBLISHING BOARD OF MANAGERS (2018)

- David Helfand, Interim Chair
- Alan Singleton, Secretary
- John Haynes, CEO, AIP Publishing
- Michael H. Moloney, CEO, AIP
- Diane Bartoli
- Wolfgang Christian
- Susan Fox
- Gerald Fuller
- A. Jeffrey Giacomini
- John Helliwell
- Kathleen Kingscott
- Ivan Petrov
- Kristen Ratan
- Greg Tananbaum

Member Society and other journals published by AIP Publishing can be found at scitation.org/publications.

Let’s Talk about Us

WHO WE ARE

- A federation of 10 professional societies in the physical sciences, representing scientists, engineers, and educators.
- Publisher of the most influential and closely followed physics magazine in the world, *Physics Today*. Established in 1948, the magazine has a circulation of 115,000 and more than 350,000 monthly online page views.
- Home of the Niels Bohr Library & Archives, one of the nation’s most comprehensive collections dedicated to the history of physics, astronomy, geophysics, and allied fields.

“As a young scientist, AIP has been invaluable. I can tap into a plethora of resources and learn from and network with a wide range of accomplished professionals who have helped me advance my career and my knowledge.”

—NATHAN SANDERS, CHIEF SCIENTIST, WARNERMEDIA APPLIED ANALYTICS, BOSTON, MA

>15K
peer-reviewed
articles
published

- Owner of AIP Publishing, a prominent scholarly publisher in the physical sciences and related disciplines.
- Home to the Society of Physics Students, the professional association for students majoring in physics, astronomy, chemistry, computer science, engineering, geology, mathematics, medicine, and other fields.

LEADERSHIP

AIP Board of Directors

- David J. Helfand, Interim Chair, AAS¹
- J. Daniel Bourland, AAPM
- Beth Cunningham, AAPT
- Judy R. Dubno, Interim Corporate Secretary, ASA²
- John Kent, Treasurer, At-large
- Kate Kirby, APS
- Rudy Ludeke, AVS
- Michael Morgan, AMS
- Faith Morrison, SOR
- Elizabeth Nolan, OSA³
- Cheryl R. Stevens, ACA
- Allison Macfarlane, At-Large
- Nathan Sanders, At-Large

AIP Officers

- Michael H. Moloney, Chief Executive Officer
- Catherine “Gigi” Swartz, Chief Financial Officer

OUR MEMBER SOCIETIES AND THE YEAR THEY JOINED

- Acoustical Society of America (1931)
- American Physical Society (1931)
- The Optical Society (1931)
- The Society of Rheology (1931)
- American Association of Physics Teachers (1932)
- American Astronomical Society (1966)
- American Crystallographic Association (1966)
- American Association of Physicists in Medicine (1973)
- Science & Technology of Materials, Interfaces, and Processing (1976)
- American Meteorological Society (2013)

Other Member Organizations

- Sigma Pi Sigma
- Society of Physics Students
- Corporate Associates

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

OUR FINANCES

This year marked the ninth consecutive year of positive operating results for AIP. The overall financial position remained strong in 2018 despite a decrease of \$13 million in net assets from \$191 million in 2017 to \$178 million in 2018.

This decrease is attributed primarily to the following:

- investment losses of \$9.6 million
- net releases from restricted reserves of \$7.8 million
- purchase of the Wenner Rare Book Collection of \$5 million
- increase in equity investment in the American Center for Physics of \$4.3 million
- a net surplus from operations of \$5 million

The Board-approved guidance provides for financial discipline that allows for a long-term approach, diversified portfolio, and annual spending from reserves between 3 and 5 percent.

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.

- John Regazzi took a leave of absence as Chair. At that time, David Helfand became Acting Chair and then Interim Chair in September.
- Judith Flippen Anderson passed away in March. At that time, Judy Dubno became Interim Corporate Secretary.
- Michael Duncan was the OSA Director until his term ended at the March meeting.

CONSOLIDATED FINANCIAL OVERVIEW (IN THE THOUSANDS)

	2018	2017	2016
Investments	\$157,486	\$174,040	\$144,376
Total Assets	\$218,397	\$230,702	\$204,996
Total Net Assets	\$178,825	\$191,950	\$166,921
Investment Return	-5.60%	16.40%	7.20%
Operating Activities			
Total Revenue	\$69,520	\$64,971	\$67,643
AIP Publishing, Net	\$15,079	\$14,809	\$14,951
AIP Programs, Net	\$(10,118)	\$(11,183)	\$(10,836)
Net Operating Surplus	\$4,961	\$3,626	\$4,115



Locations

AMERICAN INSTITUTE OF PHYSICS

1 Physics Ellipse
College Park, MD 20740
+1 301.209.3100
aip.org

AIP PUBLISHING

1305 Walt Whitman Road
Suite 300
Melville, NY 11747
+1 516.576.2200
publishing.aip.org

AIP Publishing Beijing Office

556, South Wing
Raycom Infotech Tower C
Kexueyuan South Road
Beijing 100190, China