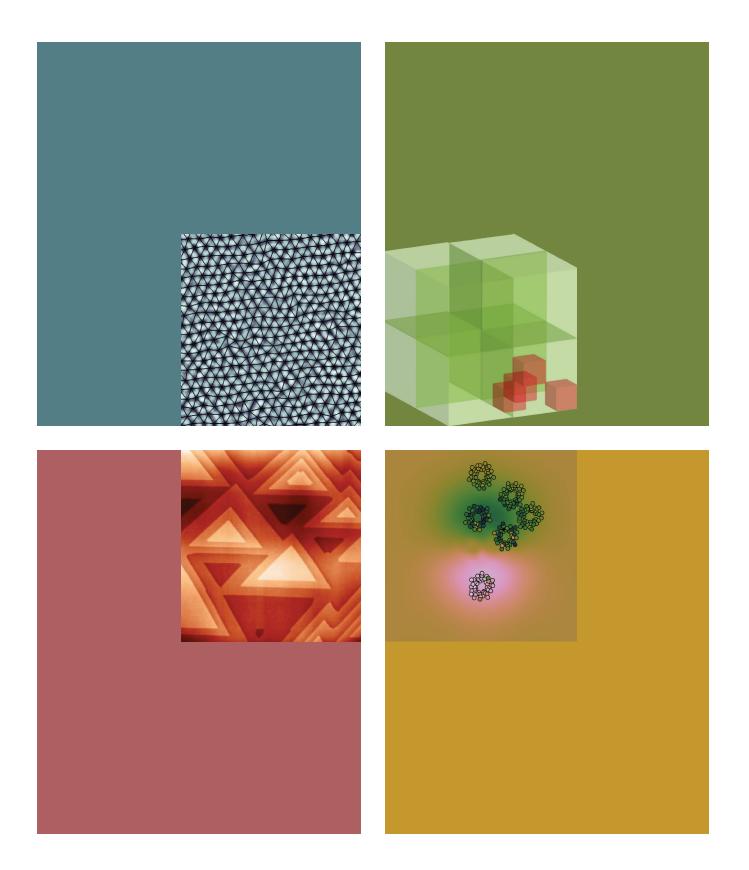


# AMERICAN PHYSICAL SOCIETY 2016 ANNUAL REPORT





### The American Physical Society strives to

**Be the leading voice for physics** and an authoritative source of physics information for the advancement of physics and the benefit of humanity;

**Provide effective programs** in support of the physics community and the conduct of physics;

**Collaborate with national scientific societies** for the advancement of science, science education, and the science community;

**Cooperate with international physics societies** to promote physics, to support physicists worldwide, and to foster international collaboration;

**Promote an active, engaged and diverse membership**, and support the activities of its units and members.

Cover Images: *Image in blue rectangle*: Disorder-induced two-step melting of vortex matter in Co-intercalated NbSe<sub>2</sub> single crystals [S. C. Ganguli *et al.*, Phys. Rev. B **93**, 144503 (2016)]. *Image in green rectangle*: Tight detection efficiency bounds of Bell tests in no-signaling theories [Z. Cao and T. Peng, Phys. Rev. A **94**, 042126 (2016)]. *Image in gold rectangle*: Measurement of the circular polarization in radio emission from extensive air showers confirms emission mechanisms [O. Scholten *et al.*, Phys. Rev. D **94**, 103010 (2016)]. *Image in red rectangle*: Low-temperature Hall effect in bismuth chalcogenides thin films [A. Yu. Kuntsevich *et al.*, Phys. Rev. B **94**, 235401 (2016)].



This is an extraordinarily exciting time in physics. 2016 saw the confirmation of the existence of gravitational waves, 100 years after Einstein's prediction. The scientific paper announcing this discovery was published in the APS flagship journal, *Physical Review Letters*. Following several years after the observational evidence for the existence of the Higgs Boson at CERN, the LIGO announcement continues to confirm that there are exciting physics discoveries ahead.

In 2016, we awarded our first APS Medal for Exceptional Achievement in Research to the distinguished physicist Edward Witten. This past year APS also recognized 50 other prize and award winners for contributions to forefront research, education, and outreach activities. The APS Council elected 248 members to Fellowship in the Society and 146 individuals were honored as Outstanding Referees for APS journals. Representatives from both the APS and European Physical Society (EPS) leadership presented a plaque at the Institute for Advanced Studies in Princeton, designating that institution as the first joint APS/EPS historic site in the U.S.

We have continued our efforts to advocate for a diverse, inclusive community of physicists. The Ad Hoc Committee on LGBT Issues released the *LGBT Climate in Physics: Building an Inclusive Community* report, with a number of recommendations for making the physics workplace more welcoming and inclusive for LGBT physicists. With the goal of increasing the number of underrepresented minorities graduating with a bachelor's degree in physics, APS, on the advice of its Committee on Minorities and with the endorsement of the APS Council, has initiated the National Mentoring Community (NMC). The NMC held its second conference at the University of Houston in October, 2016.

In the area of education, I have been exploring how undergraduates might have more opportunities to do research at international facilities, given the declining number of large facilities in high-energy physics in the U.S.

It has been an honor and a privilege to serve as president of the American Physical Society. My sincere thanks are extended to the staff of APS and our outstanding members.

Sincerely yours,

omen A. Neal

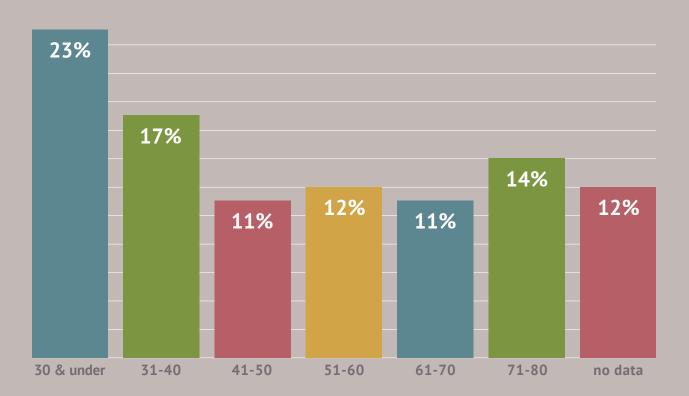
Homer A. Neal 2016 APS President

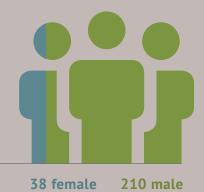
# APS Membership in 2016

NUMBER OF APS MEMBERS



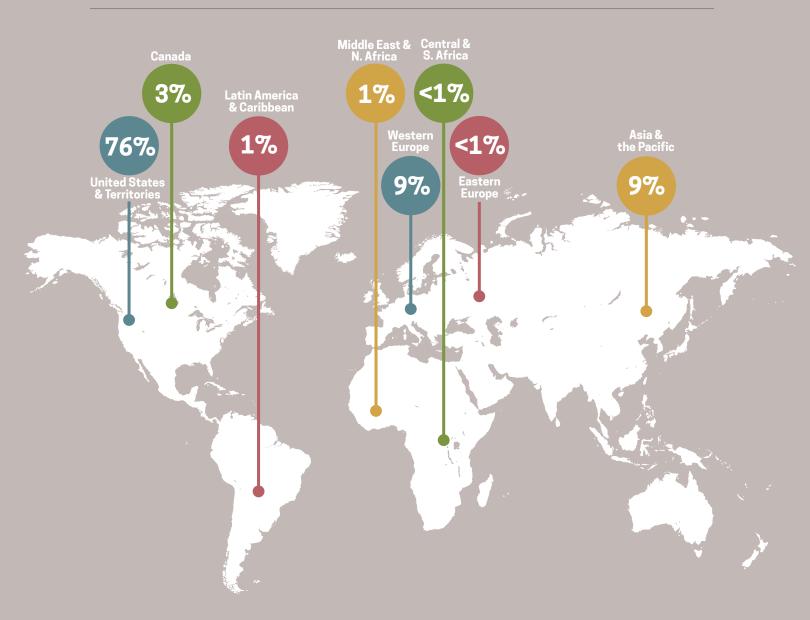
### AGE DISTRIBUTION OF APS MEMBERS





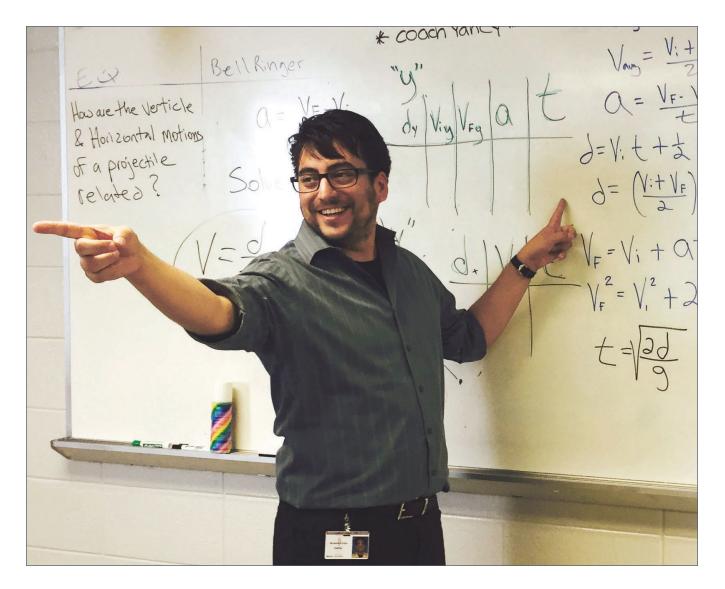
#### 248 APS FELLOWS

### **APS MEMBERS RESIDED IN 109 COUNTRIES**



# Be a Leading Voice for Physics

The APS objective is to advance and diffuse the knowledge of physics, and the Society prides itself on hosting the top collection of physics research journals—the *Physical Review* family—which publishes the most important physics research. Representing over 54,000 members working in academia, national laboratories, and industry in the U.S. and throughout the world, APS also provides opportunities for our diverse group to support their passions. This past year, advocacy groups for political outreach and industry made a huge impact.



### Growing the *Physical Review* Family

APS started 2016 with the launch of *Physical Review Fluids*. Endorsed by the APS Division of Fluid Dynamics, the journal is dedicated to research that helps advance our understanding of fluid dynamics. *Physical Review Fluids* continues the quality that APS journals are known for; the journal staff and editorial board vetted over 700 peer-reviewed submissions since its inception, and published eight issues in its first volume. This SCIindexed, online journal, now with over 280 accepted submissions, is an ideal complement to the *Physical Review* collection.

In 2016, Physical Review Letters, the most-cited physics journal in the world, published an extraordinary paper reporting the first detection of gravitational waves at the Laser Interferometer Gravitational-Wave Observatory (LIGO). Authors gain high visibility and broad dissemination of their work when publishing with *Physical Review Letters*, and the research became a worldwide historic event overnight-the editorial office reported 10,000 hits per minute on the journal server. This discovery, 100 years after the prediction of gravitational waves by Einstein, provided the first observational evidence that black hole binary systems can form and merge in the universe. APS and the editorial board of Physical Review Letters were proud to include this ground-breaking research in the *Physical Review* family.

### New Leadership at the Journals

APS welcomed Pierre Meystre as editor in chief, Matthew Salter as publisher, Hugues Chaté as lead editor of *Physical Review Letters*, Jean-Michel Raimond and Cristina Marchetti as lead editors of *Physical Review X*, and John Kim and Gary Leal as lead editors of *Physical Review Fluids*.

### **Policy and Advocacy in Action**

The APS Office of Public Affairs (OPA) continued to be at the forefront of physics in action – OPA developed two policy recommendations that were addressed in U.S. congressional legislation and adopted by executive branch agencies, creating a powerful voice for physics in government. In response to the soaring cost of helium in 2016, OPA generated bipartisan action in the U.S. House Committee on National Resources to conserve and advance the nation's helium reserves. OPA also worked with select members of Congress to advance legislative proposals in the American Innovation and Competitiveness Act, signed into law by President Obama. For over 2,000 members who sought involvement at the political level, OPA hosted grassroots advocacy efforts across the U.S., contacting each members' elected officials through meetings, phone calls, social media, and op-eds.

To provide additional input to the Society about physics in the private sector, APS formed the Industrial Physics Advisory Board (IndBoard), with the help of the APS Forum on Industrial and Applied Physics. IndBoard will work with OPA to create statements, reports, and provide input on future policies. Scientists at Ford, General Electric, IBM, Texas Instruments, and other private companies make up the body of IndBoard. They are supporting a report, *The Impact of Industrial Physics on the U.S. Economy*, to be issued in late 2017.

### **Worldwide Recognition**

In 2016, science stories promoted through APS media relations efforts appeared globally, in print and online.

*Facing image*: Ricky Farfan, a graduate of the PhysTEC program at Georgia State University, teaches physics at a public school in Atlanta.

# **Provide Effective Programs**

Connecting our members to the right tools to further their careers begins with the programs started by APS. With new initiatives added each year, APS fosters coalitions, meetings, and awards to support our members' careers and interests.







#### **Strong Focus on Education**

APS launched the PIPELINE program to develop new methods for teaching innovation and entrepreneurship in physics. Six institutions: the University of Colorado at Denver, George Washington University, Loyola University of Maryland, Rochester Institute of Technology, College of William and Mary, and Wright State University are developing new methods to prepare students for careers as scientists and innovators in the private sector. A grant from the National Science Foundation (NSF) will support these institutions for three years, allowing them to create and share curricular approaches to preparing students for careers outside of academia.

Addressing the severe shortage of qualified physics teachers since its inception in 2001, the Physics Teacher Education Coalition (PhysTEC) has supported more than 40 institutions to build model teacher education programs. In collaboration with the American Association of Physics Teachers (AAPT) and NSF, APS continues to help PhysTEC grow, and it now supports a network of 300 member institutions spanning all 50 states. The coalition prepared one in eight new U.S. teachers with a physics degree this year alone, and their comprehensive sites have nearly tripled their number of graduates wellprepared to teach physics.

### **Connecting Through Outreach**

Providing story-based activities to middle school students since 2005, the APS outreach team offered kits to explore the fundamental concepts of physics. Thanks to generous donations from members and the Eucalyptus Foundation, PhysicsQuest kits reached 400,000 students in 2016. Shipped with each kit was the 8th issue of the Spectra educational comic book series, *Spectra's Current Crisis*. APS also hosts a minigrant program, which awards up to \$10,000 to members wishing to start their own outreach programs. Another ten proposals were successfully funded at full capacity to kickstart the creative projects, including physics comedy sketch shows, physics summer camps, and more.

## **Highlighting Diverse Career Options**

Career-related events in 2016 included undergraduate research sessions, panels on non-academic careers, and a graduate school fair. At the APS March Meeting in Baltimore, Maryland, an industry career panel and a career workshop attracted nearly 300 graduate students and 180 postdocs.

Raymond Beausoleil, the 2016 recipient of the Distinguished Lectureship on the Applications of Physics Award, delivered five lectures on industry careers throughout the year.

### **Recruiting Minorities in Physics**

In 2016, the APS Bridge Program placed 40 underrepresented minority students into graduate physics programs, none of whom would have gained admission that year without APS assistance. This was also the first year the Bridge Program assisted over 30 students, and their network now spans six official Bridge Sites and 21 departments that have adopted practices supporting bridge students. The overall program has an 88% student retention rate, compared to the national average retention rate in physics doctoral programs at 59%.

The APS National Mentoring Community (NMC) was in its second year, including mentors and mentees from over 115 universities around the U.S. Hoping to increase the number of underrepresented ethnic and racial minority students who earn bachelor's degrees in physics, the NMC supports faculty and students to engage in a mentoring relationship. In October 2016, more than 110 participants gathered in Houston, Texas for the second NMC conference.

In 2016, the APS Conferences for Undergraduate Women in Physics (CUWiP) brought together nearly 1,500 women at ten regional sites, with this year marking the first addition of an international site in Canada. Now in its twelfth year, these conferences provide undergraduate women with opportunities to gain motivation and confidence to seek advanced degrees or pursue professional careers in physics, and to learn about available resources. Nearly every female physics major in the U.S. attends one or more of these events during their undergraduate studies.

Clockwise, from top: Javon Knox, second-year Bridge Program student at Florida State University, working in the laboratory. CREDIT: SIMON CAPSTICK, FLORIDA STATE UNIVERSITY. David Reitze speaking at LIGO@Lunch session at the APS April Meeting 2016. Participants at the REU and graduate school fair at the 2016 National Mentoring Community conference in Houston.

# Collaborate with Scientific Societies

To foster collaboration, APS networks with physics and scientific societies across the globe. With new bonds made every year, these lasting connections help APS advance scientific awareness across borders. APS worked with more than 16 countries during 2016.







# Brazilian Physical Society and the São Paulo Research Foundation

In partnership with the Brazilian Physical Society and the São Paulo Research Foundation, APS organized the U.S.-Brazil Young Physicists Forum, which provided over 50 early-career physicists from the U.S. and Brazil with networking and scientific events to help launch new scientific collaborations. APS also offered exchanges with Brazil and India for graduate students, postdocs, and senior physicists.

### **Continuing Workshops with IOP and ICTP**

APS teamed up with the UK Institute of Physics (IOP) and the International Centre for Theoretical Physics (ICTP) to co-host a one-week intensive workshop, the 6th Annual Entrepreneurship for Scientists and Engineers from Developing Countries Workshop. Designed for members of the United Nations, UNESCO, or International Atomic Energy Agency, the 40 participants gathered in Trieste, Italy, home of ICTP, and learned the entrepreneurial skills necessary to commercialize their scientific inventions.

### Middle East Physicists Travel Award

APS has recruited eight other scientific societies in Europe and the United States toward the ongoing SESAME Travel Award Program. This joint partnership annually supports training opportunities for scientists in the Middle East, and will help build a cadre of scientists trained to use the SESAME synchrotron laboratory in Allan, Jordan when it launches operations in 2017.

# Budding Partnership with the Cuban Physical Society

2016 APS President-elect Laura Greene and Amy Flatten, director of international affairs, traveled to Havana, Cuba to meet with the Board of the Sociedad Cubana de Física (SCF), following an invitation by María Sánchez-Colina, president of the SCF. This meeting allowed the APS/SCF partnership to be explored. APS is also working with other scientific organizations toward collecting and supplying equipment donations for Cuban physicists.

### The First Joint APS/EPS Historic Physics Site

APS teamed up with the European Physical Society (EPS) to recognize the Institute for Advanced Study (IAS) in Princeton, New Jersey, for its pivotal involvement in the advancement of theoretical physics. IAS is the first joint historic physics site in the United States. IAS has supported over 33 Nobel Laureates and scores of medalists and winners of prestigious awards, including Albert Einstein, who joined as one of the Institute's first professors just three years after its establishment.

Clockwise, from top: Attendees of the U.S.-Brazil Young Physicists Forum at the APS March Meeting 2016. EPS President Christophe Rossel, 2016 APS President Homer Neal, APS CEO Kate Kirby, and IAS Director Robbert Dijkgraaf (*left to right*) honor the Princetonbased Institute of Advanced Study. CREDIT: INSTITUTE OF ADVANCED STUDY. Michelle Lollie, first-year Bridge Program student at Indiana University. CREDIT: ION URHEIM, INDIANA UNIVERSITY.

# Promote an Engaged & Diverse Membership

Every year APS hosts a number of local and international meetings. Scientific meetings held by APS annually continue to attract larger crowds, and new units are being added to support the activities of our members.



### **Creating New Units**

Three new membership units were created in 2016 to promote members' growing interests: The Forum for Early Career Scientists (FECS) provides support for those who are starting out in their physics career, medical physicists are represented in the new Topical Group on Medical Physics (GMED), and the Topical Group on Gravitation (GGR) has grown into the new Division of Gravitational Physics.

## **Connecting Locally**

APS Local Links provided events for physics students, postdocs, and physicists working in industry, national labs, and academia. It's an opportunity to network, share ideas, and build relationships on a local level. In 2016, APS Local Links hosted 24 events and expanded to eight active groups, adding a new group in the Research Triangle in North Carolina.

# APS Medal for Exceptional Achievement in Research

The inaugural APS Medal for Exceptional Achievement in Research was presented to Edward Witten of the Institute for Advanced Study in January 2016. This new award was funded by a generous donation from entrepreneur Jay Jones, who committed a total endowment of \$2 million in 2014—the largest single-donor gift received by APS. The \$50,000 prize and prestigious medal recognizes achievements of researchers from across all fields of physics. In addition to the Medal, in 2016, APS bestowed more than 50 other prizes and awards.

*Clockwise, from top:* Crowd at APS March Meeting. APS Medal for Exceptional Achievement in Research. APS Report, *LGBT Climate in Physics: Building an Inclusive Community.* 

#### **Fostering Inclusiveness**

The APS report from the Ad Hoc Committee on LGBT Issues—*LGBT Climate in Physics: Building an Inclusive Community*—was endorsed by the APS Council and was put into action to foster a more supportive and inclusive society. The first of its kind from a physics society, this report studied issues of inclusion for physicists who identify as lesbian, gay, bisexual, transgender, and other sexual and gender minorities.

# **Coming Together at Scientific Meetings**

APS hosts a variety of scientific meetings to bring together members in specific units and physics disciplines. In 2016, the main scientific meetings in March and April continued to attract larger crowds to engage all backgrounds of our membership.

As the largest single physics meeting in the world, the 2016 APS March Meeting in Baltimore, Maryland featured a Special Kavli Foundation Symposium on Physics Frontiers, updates from the Department of Energy Office of Science, and a keynote address from former U.S. Secretary of Energy Ernest Moniz. The meeting also hosted the Forum on Industrial & Applied Physics' second Industry Day, relating to all things "From Nano to Meso." The invited sessions, which highlighted how analysis and modeling can significantly cut product development time, included a career-focused panel discussion, which attracted an overflow attendance.

Presenting research on topics including particle physics, nuclear physics, astrophysics, and gravitation, the 2016 April Meeting in Salt Lake City, Utah hosted, among other events, the Kavli Foundation Keynote Plenary session, "Commemorating the 60th Anniversary of Cowan and Reines Detection of the Neutrino in 1956," and a public lecture by Lisa Randall, a theoretical physicist at Harvard University.

The larger divisional meetings are held in different locations every year. Notably, the 2016 Division of Fluid Dynamics (DFD) Meeting brought together more than 3,000 attendees in Portland, Oregon—the largest crowd on record. The DFD meeting is known for its Gallery of Fluid Motion, which highlights the aesthetics of fluid motion in video and poster submissions.

# Statements of Financial Position

December 31, 2016 and 2015

	2016	2015
ASSETS		
Cash and cash equivalents	\$ 13,343,860	\$ 16,386,705
Investments, at fair value	148,724,910	134,808,128
Accounts receivable, net of allowance for doubtful accounts of \$56,500 in 2016 and 2015	1,347,477	1,068,696
Pledges receivable, net	164,988	241,873
Prepaid expenses and other assets	676,833	1,416,740
	3,384,639	3,560,115
Equity interest in American Center for Physics	18,019,332	18,658,981
Land, building and equipment, net		
	558,616	533,505
Land, building and equipment, net	\$ 558,616 <b>186,220,655</b>	\$ 176,674,743
Land, building and equipment, net Beneficial interest in perpetual trust Total assets	\$ · ·	\$
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS	\$ · ·	\$
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS Liabilities	 186,220,655	176,674,743
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS Liabilities Accounts payable and accrued expenses	 186,220,655	176,674,743
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS Liabilities Accounts payable and accrued expenses Deferred revenues:	 <b>186,220,655</b> 3,599,775	<b>176,674,743</b> 3,437,398
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS Liabilities Accounts payable and accrued expenses Deferred revenues: Publications	 <b>186,220,655</b> 3,599,775 11,408,096	<b>176,674,743</b> 3,437,398 12,016,438
Land, building and equipment, net Beneficial interest in perpetual trust Total assets LIABILITIES AND NET ASSETS Liabilities Accounts payable and accrued expenses Deferred revenues: Publications Membership dues	 186,220,655 3,599,775 11,408,096 2,842,637	<b>176,674,743</b> 3,437,398 12,016,438 2,688,788

145,681,085		138,278,962
2,641,543		2,553,932
12,433,787		12,092,298
4,215,453		1,297,043
\$ 126,390,302	\$	122,335,689
\$	4,215,453	4,215,453 12,433,787

# Statements of Activities

December 31, 2016 and 2015

CHANGE IN UNRESTRICTED NET ASSETS Revenues	\$		
	\$		
	\$		
Research publications		38,919,625	\$ 39,223,627
Scientific meetings		6,216,242	 7,117,052
Membership operations		4,065,917	4,134,226
Public affairs and programs		2,750,889	2,314,834
Net assets released from restrictions		964,214	748,304
		52,916,887	53,538,043
Expenses			
Program services			 
Research publications		31,021,023	29,634,330
Scientific meetings		6,297,110	6,525,803
Membership operations		6,057,976	 5,915,498
Public affairs and programs		8,049,293	7,391,342
Prizes and related costs		964,214	748,304
Total program services	•	52,389,616	50,215,277
Supporting services			
Fundraising		406,051	 627,507
General and administrative		2,609,260	2,697,482
Total supporting services		3,015,311	3,324,989
Total expenses		55,404,927	 53,540,266
Loss from operations	(	2,488,040)	 (2,223)
Non-operating activities			 
Income from investments		2,627,505	 2,827,396
Net unrealized (loss) gain on investments		8,021,253	 (4,891,962)
Net realized gain on investments		(462,940)	1,463,110
Equity interest in American Center for Physics		(175,476)	 397,206
Change in post-retirement medical benefits other than net periodic post-retirement medical benefit cost		(549,279)	(741,574)
		9,461,063	<u> </u>
			 (945,824)
Change in unrestricted net assets		6,973,023	 (948,047)
CHANGE IN TEMPORARILY RESTRICTED NET ASSETS			
Contributions		561,980	393,164
Income from investments		743,723	718,813
Net assets released from restrictions		(964,214)	(748,304)
Change in temporarily restricted net assets		341,489	363,673
CHANGE IN PERMANENTLY RESTRICTED NET ASSETS			
Contributions		62,500	167,974
(Loss) gain on beneficial interest in perpetual trust		25,111	(14,711)
Change in permanently restricted net assets		87,611	153,263
Change in net assets	\$	7,402,123	\$ (431,111)

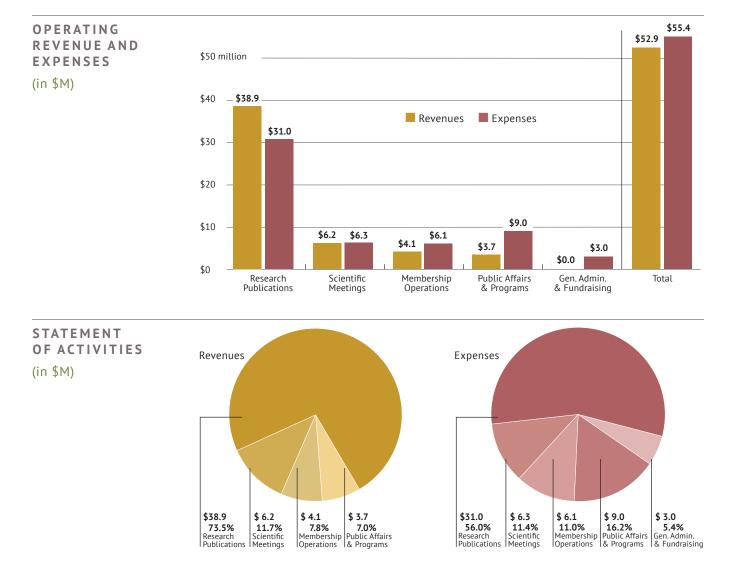


During the fiscal year 2016, the total assets of the American Physical Society increased from \$176.7M to \$186.2M, while the Society's liabilities increased to \$40.5M from \$38.4M the previous year.

The previous two tables summarize the financial operations of the Society as of December 31, 2016. The table headed "Statements of Financial Position" shows the final financial position of the Society for 2016 and 2015. The table headed "Statements of Activities" shows the financial activities of the various components of the Society for the 2016 and 2015 fiscal years. The distribution of operating revenues and expenses across the components of the Society is also displayed graphically in the accompanying figures.

Net assets at the end of fiscal year 2016 were \$145.7M, compared with \$138.3M at the end of 2015. These include \$15.1M in restricted net assets, which are funds for prizes and awards and for programs supported by the 21st Century Campaign. The restricted net assets increased by \$0.4M. Board designated funds increased from \$1.3M to \$4.2M primarily due to additional funds committed to support publishing innovations. Unrestricted net assets increased by \$4.1M.

Cash and equivalents equaled \$13.3M at the end of 2016 while investments (held primarily in equities and fixed income issues) were valued at \$148.7M at the end of 2016.



# 2016 Contributions

APS is grateful for gifts received in support of its objective: the advancement and diffusion of the knowledge of physics. Since membership dues cover only the cost of member services, APS depends in large part on contributions in order to provide vital programs in the areas of education, diversity, international affairs, public affairs, public outreach, matching membership, and honors. This year, we are pleased to introduce and recognize our Leadership Circle, donors whose giving has totaled \$100,000 or more for the past ten years. It is also our pleasure to highlight our sustaining, individual donors who have consistently made annual gifts totaling \$2,500 or more. These donors are highlighted in blue.

# LEADERSHIP CIRCLE

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Anonymous (1)* Anonymous (2) Anonymous (3) Charlotte Anderson * M. Hildred Blewett * David Braslau Mr. and Mrs. Kenton Brown The Family of Richard L. Greene Jay Jones* Gordon E. Moore The Family of Stanford R. Ovshinsky Jonathan F. Reichert and Barbara Wolff-Reichert The Family of J. J. and Noriko Sakurai Robert W. Stanek* Aleksandar Svager*	<ul> <li>AIP Publishing, <i>The Journal of Chemical Physics</i></li> <li>Argonne National Laboratory</li> <li>Brookhaven National Laboratory</li> <li>CERN</li> <li>Deutsches Elektronen-Synchrontron (DESY)</li> <li>The Dow Chemical Company</li> <li>The Eucalyptus Foundation</li> <li>Fermi National Accelerator Laboratory</li> <li>HTC-VIA Group</li> <li>IBM</li> <li>Intel Foundation</li> <li>The Kavli Foundation</li> <li>Lawrence Berkeley National Laboratory</li> <li>Los Alamos National Laboratory</li> <li>Richard Lounsbery Foundation</li> <li>M Squared Lasers</li> <li>National Science Foundation</li> <li>Oak Ridge National Laboratory</li> <li>Research Corporation for Science Advancement</li> <li>The San Francisco Foundation</li> <li>SLAC National Accelerator Laboratory</li> <li>Thorlabs, Inc.</li> </ul>
* Bequest intention	TOPTICA Photonics, Inc.

#### \$100,000 and above

IBM National Science Foundation Thorlabs, Inc. TOPTICA Photonics, Inc.

#### \$10,000 to \$99,999

Anonymous (1) Beverly Kobre Berger Herbert Berk Fred Blum, Jr. Eric Cornell and Celeste Landry Joyce Freedman The Family of Richard L. Greene Robert Hilborn David Pritchard Ellie Ramsey Steven Strong Virginia Trimble Harry and Linda Wang **Richard Zare** AIP Publishing:

• The Journal of Chemical Physics • Physics of Fluids Argonne National Laboratory Brookhaven National Laboratory CFRN Deutsches Elektronen-Synchrontron (DESY) Fermi National Accelerator Laboratory GE Global Research General Motors Corporation Harvard University, Dept. of Physics Thomas Jefferson National Accelerator Facility The Kavli Foundation KEK High Energy Accelerator Research Organization Los Alamos National Laboratory Menlo Systems GmbH National Superconducting Cyclotron Laboratory, MSU Oak Ridge National Laboratory

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Lawrence Berkeley National Laboratory CNRS - LIMSI DW Gore Family Foundation

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Physics

IPAC'16

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